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Factors Influencing the Development and Implementation of Nurse-led Antiretroviral Treatment Clinics in Uganda

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Declaration

‘I, Eric Ikoona, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.’

Abstract

A major barrier to universal access to antiretroviral treatment (ART) in Uganda is the critical shortage of trained healthcare workers, particularly doctors. Although there are plans to legalise nurses to provide ART, little is known about the potential barriers and facilitators to the development and implementation of effective nurse-led ART clinics in Uganda. Thus, this study sought to understand the factors influencing the introduction of nurse-led ART clinics in Uganda as well as to determine nurses' and doctors' competencies in delivering HIV care to inform the design of strategies that would enhance their success. To this end, descriptive cross-sectional studies through a questionnaire survey, semi-structured interviews, and focus group discussions (FGDs) were conducted with numerous stakeholders including patients. HIV clinical vignette tests were used to assess doctors' and nurses' competencies in delivering ART. The results revealed that nurse-led ART clinics were already widespread in Uganda, albeit the lack of a policy allowing them to operate. Moreover, their successful development and implementation is critically dependent on nurses' competence, self-confidence, motivation, authority, and autonomy, as well as on the availability of systems and human resource support and on the acceptability of nurses as providers of ART by patients and other stakeholders. Major challenges identified include the lack of patients' and community support, the absence of legal and regulatory frameworks, and a weak general health system including inadequate equipment, supervision support and mentoring, among others. In conclusion, this study found that nurse-led ART clinics are already operating on a wide scale in Uganda, although on an ad hoc basis, and are viewed by stakeholders as a key strategy for scaling up human immune deficiency virus HIV services including ART. Now may be the appropriate time to plan adequately for the legalised and regulated development and implementation of these clinics while addressing the numerous factors that influence nurses' ability and capacity to deliver HIV services efficiently and effectively.

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List of Abbreviations

ACP	AIDS Control Programme
AIDS	Acquired Immune-Deficiency Syndrome
ART	Antiretroviral Treatment
ARV Clients Treatment	People Living with Human Immunodeficiency Virus on Antiretroviral Treatment
ARV	Antiretroviral medicines
CPD	Continuous Professional Development
FGDs	Focus Group Discussions
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoU	Government of Uganda
HC	Health Centre
HIV	Human Immune-deficiency Virus
HRH	Human Resources for Health
HSD	Health Sub-District
MoH	Ministry of Health
NP	Nurse Practitioner
PEPFAR	Presidential Emergency Plan Fund for AIDS Relief
PLHIV	Persons Living with Human Immunodeficiency Virus
QoC	Quality of Care
SP	Standardised Patient
SSA	Sub-Saharan Africa
TTR	Treat Train and Retain
UBoS	Uganda Bureau of Statistics
UK	United Kingdom
UNAIDS	Joint United Nations Programme on AIDS
UNICEF	United Nations International Children's Emergency Fund
USA	United States of America
WHO	World Health Organisation

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1 Introduction

In this introductory chapter, the background, aim, objectives, and justification of this study are presented.

1.1 Study Background

Even though the HIV and acquired immune deficiency syndrome (AIDS) is a global epidemic, sub-Saharan Africa (SSA) is the most affected region (UNAIDS 2015). At the end of 2015, the Joint-United Nations Programme on HIV/AIDS (UNAIDS) estimated that of the 36.7 million people living with HIV (PLHIV) worldwide, 25.8 million (70 percent) were residing in SSA (WHO 2015, UNAIDS 2016). While the cure for HIV infection is still elusive, there is no doubt now that early initiation of antiretroviral treatment (ART) leads to a better prognosis for PLHIV, and prevents onward transmission of HIV (WHO 2015). Armed with this information on the advantages of early HIV treatment, the World Health Organisation (WHO) released guidelines in 2015, recommending ART initiation to everyone living with HIV, irrespective of their CD4 cell count (WHO 2015). With this recommendation in place, all the 36.9 million PLHIV globally are eligible for ART. This proposal, together with the ambitious 95–95–95 UNAIDS Fast-Track targets, aimed at 95 percent of PLHIV knowing their status, 95 percent ART coverage and 95 percent virologic suppression rates by 2030 (UNAIDS 2014), necessitates a further scale-up of the provision of ART, while putting in place measures to retain patients in care (Assefa, Pillay et al. 2014).

Although these recommendations are commendable as they aim at achieving major reductions in new HIV infections and HIV-related mortality, they also imply that countries must increase their efforts to ensure that all PLHIV gain access to essential HIV treatment and prevention services. Without any doubt, the implementation of the WHO (2015) recommendations will require substantial investments including massive increases in the human resources for health (HRH). However, it should be noted that by the end of 2015, only 15.8 million (40 percent) of the PLHIV globally were receiving ART. Furthermore, as the cost and complexity of ART decline, achieving universal access to ART is limited by the worldwide shortage of well-trained and motivated healthcare workers, particularly in SSA (Chen, Evans et al. 2004, Narasimhan, Brown et

al. 2004, Marchal, De-Brouwere et al. 2005, Callaghan, Ford et al. 2010, Davies, Homfray et al. 2013, GHWA and WHO 2013, Baine and Kasangaki 2014, Kredo, Adeniyi et al. 2014, AMREF 2015, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016, Spies, Gray et al. 2016). This acute shortage of qualified medical staff in resource-poor countries is a major concern in international health, with the WHO estimating a global deficit of over four million trained medical staff in 2006 (WHO 2006d).

Since thirty-six of the fifty-seven countries affected by the severe shortage of HRH are in SSA, Uganda inclusive (AMREF 2015), some authors have described the scarcity of HRH in SSA as a humanitarian crisis (Dovlo 2004, Dovlo 2005, Dovlo 2005b, WHO 2006a, Kredo, Adeniyi et al. 2014). This scarcity in SSA is mainly due to lack of training capacity, inefficient deployment of healthcare workers, inadequate remuneration, migration of doctors and nurses to better-paid jobs abroad, the impact of HIV on these groups of staff, and limited budgets allocated to health services (Ncayiyana 1999, Pang, Lansang et al. 2002, Ncayiyana 2004, Stilwell, Diallo et al. 2004, WHO 2006d, Zachariah, Ford et al. 2009, Baine and Kasangaki 2014, AMREF 2015, Crowley and Mayers 2015).

To achieve the grand targets of universal access to ART in resource-limited settings in the face of the severe shortage of HRH, the international community advocates for decentralisation and task shifting (Assefa, Alebachew et al. 2014, Crowley and Mayers 2015). Indeed, the WHO launched the “Treat, Train, Retain” (TTR) strategy as far back as August 2006, in response to the severe shortage of healthcare workers, to reinforce and increase the number of healthcare workers by addressing both the causes and the effects of HIV on health (WHO 2006d, WHO 2007a, WHO 2008b). Under the TTR plan, task shifting, which falls under the “Train strategy”, has been suggested as an innovative mechanism for the public health community and national governments to address the HRH shortage (Hirschhorn, Oguda et al. 2006).

The WHO (2008b) has defined task shifting as the transfer of tasks from highly trained to less-trained healthcare cadres, where appropriate. It stems from the belief that equipping lower level healthcare cadres, such as nurses, with skills to initiate ART takes

a shorter period than the six to seven years required to train doctors (Gilbert 1996, WHO 2008, Kredo, Ford et al. 2013). Task shifting aims at achieving improved access, safety, efficient, and effective delivery of health services to extremely vulnerable populations who often live in remote under-served areas, without compromising the quality of care provided (WHO 2008, WMA 2009). Task shifting is successful only when clearly outlined roles are delegated to healthcare workers who have acquired the specific skills through training and mentorships, and other quality assurance mechanisms (WHO, PEPFAR et al. 2007, WMA 2009, Callaghan, Ford et al. 2010, Georgeu, Colvin et al. 2012, Bocoum, Kouanda et al. 2013, Martínez-González 2015).

Many countries in SSA are utilising nurses to provide ART out of the need to alleviate human resource constraints (Shumbusho, Griensven et al. 2009, Fulton, Scheffler et al. 2011, Emdin and Millson 2012, Fairall, Bachmann et al. 2012, Rashidian, Shakibazadeh et al. 2013, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016). However, although nurse-led clinics have been widely promoted as mechanisms for expanding ART access in SSA, key barriers and facilitators to their development and implementation in non-research settings are still unknown but slowly beginning to emerge (Colvin, Fairall et al. 2010, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016). In addition, even though nurses are being promoted as a partial solution to delivering ART in the absence of doctors, the HIV/AIDS pandemic in SSA has taken a toll on nurses as a professional group (Stein, Lewin et al. 2007, Harrowing 2009). The challenges resulting from the HIV/AIDS pandemic experienced by nurses include stigma and discrimination (Mill 2003, Okafor and Holder 2004, Mwinituo and Mill 2006, Holzemer, Uys et al. 2007), inadequate knowledge (Walusimbi and Okonsky 2004), heavy workloads leading to frustration and stress (Fournier, Kipp et al. 2007, Mavhandu-Mudzusi, Netshandama et al. 2007), negative attitudes (Mbanya, Zebaze et al. 2001), and lack of access to basic protective supplies, which render nursing staff vulnerable to nosocomial infection (Stallknecht 1998, International-Council-of-Nurses 2000). Such challenges severely limit nurses' attempts to provide competent and safe HIV care (Harrowing 2009). Severe burnout among nurses resulting from the overwhelming workload in HIV clinics and resource constraints has also been reported by numerous studies conducted in SSA (Cilliers 2003, Gaede, Mahlobo et al. 2006, Uebel, Nash et al. 2007, Turan, Bukusi et al. 2008, Harrowing 2011). Other challenges reported in the literature include inadequate support supervision and mentorship programmes, the

absence of regulatory mechanisms, the weak health systems, and the lack of monitoring and evaluation systems (Rashidian, Shakibazadeh et al. 2013, Crowley and Mayers 2015).

Despite the numerous challenges, nurse-based task shifting for ART has been found to be viable, safe, cost-effective, and to improve access to HIV treatment for PLHIV who may not have any access if the strategy is not implemented (Bedelu, Ford et al. 2007, Bolton-Moore, Mubiana-Mbewe et al. 2007, Callaghan, Ford et al. 2010, Emdin, Chong et al. 2013, Mdege, Chindove et al. 2013, Mwai, Mburu et al. 2013, Iwu and Holzemer 2014, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016, Spies, Gray et al. 2016). Indeed, Fulton, Scheffler et al. (2011) have argued that outcomes of task shifting models should be compared with those of no care at all as many patients would not receive any treatment if it was not for this initiative. Callaghan, Ford et al. (2010) and Crowley and Mayers (2015), in two separate systematic reviews, found task shifting a cost-effective strategy for scaling up HIV treatment without compromising patient outcomes. In addition, clinical outcomes such as virological suppression among patients seen by non-physicians in expanded HIV clinical roles are non-inferior to those seen by doctors (Gimbel-Sherr, Micek et al. 2007, Jaffar, Amuron et al. 2009, Sherr, Pfeiffer et al. 2009, Vasan, Kenya-Mugisha et al. 2009, Sanne, Orrell et al. 2010, Selke, Kimaiyo et al. 2010, Fairall, Bachmann et al. 2012, Mdege, Chindove et al. 2013, Kredo, Adeniyi et al. 2014). Emerging evidence also indicates that task shifting is acceptable to patients (Assefa, Kiflie et al. 2012, Georgeu, Colvin et al. 2012, Kredo, Adeniyi et al. 2014).

However, concerns have been raised that the positive coverage and clinical outcomes observed in many task shifting initiatives could have arisen from the massive support such initiatives received regarding training and support supervision to ensure that lower cadres successfully deliver such shifted services (Bedelu, Ford et al. 2007, Colvin, Fairall et al. 2010, Kredo, Ford et al. 2013, Kredo, Adeniyi et al. 2014, Crowley and Mayers 2015). Undeniably, task shifting in practice may be more complex without such support structures and investments (Colvin, Fairall et al. 2010, Emdin and Millson 2012, Rashidian, Shakibazadeh et al. 2013). With that in mind, those positive outcomes may not necessarily apply to Uganda and to other countries in SSA, whose public healthcare systems are severely resource-constrained (Emdin, Chong et al. 2013, Rashidian,

Shakibazadeh et al. 2013, Kredo, Adeniyi et al. 2014, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016). Indeed, evidence of key facilitators and barriers to the development and implementation of task shifting initiatives in weak healthcare systems continues to be limited (Callaghan, Ford et al. 2010, Colvin, Fairall et al. 2010, Georgeu, Colvin et al. 2012, Rashidian, Shakibazadeh et al. 2013, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016). Most studies have focused on settings with vertical programmes, thus presenting minimum evidence for decision-making about task shifting initiatives in public health systems (Crowley and Mayers 2015). In fact, Kredo, Adeniyi et al. (2014) and Crowley and Mayers (2015), in systematic reviews on task shifting in SSA, found no evidence to inform practice in regular settings without massive donor support and special population groups. Crowley and Mayers (2015) and Colvin, Fairall et al. (2010) have also noted the absence of evidence on nurses' capacity to competently manage patients on both ART and other chronic co-morbid conditions.

To increase access to ART to the enormous number of HIV-positive patients amidst the severe shortage of doctors, the Government of Uganda (GoU) has, since 2007, planned to empower nurses legally to initiate first-line ART (WHO 2008b), though with little success (Baine and Kasangaki 2014). The difficulties the GoU has faced in attempting to enact task-shifting policies are not surprising and unique to it, since in Uganda, just like in many other countries, doctors are perceived as providing the best technical quality of care (Guberski 2007, Laurant, Reeves et al. 2007). Therefore, to argue that nurses can provide equal or sometimes better care is a challenge to the government. In Uganda, the perception that only doctors provide the best ART was heightened by the fact that this treatment was introduced with a strong conviction and message from the government that it is complicated and should only be prescribed by well-trained doctors (MOH 2003).

Although a few studies conducted in Uganda give valuable information on the potential factors influencing the development and implementation of effective nurse-led ART clinics, they have major limitations as most of them have focused on task shifting for general healthcare delivery as opposed to HIV or nurse-led HIV services (ECSA-HC 2010, Baine and Kasangaki 2014). Currently, there are no documented studies in Uganda on the barriers and facilitators to the development and implementation of effective nurse-

led ART clinics from the perspectives of a wide range of stakeholders including nurses, doctors, PLHIV, and policymakers, among others. Furthermore, to date, no published study has systematically investigated nurses' and doctors' competencies in HIV care in Uganda and elsewhere in SSA, in non-intervention settings. Moreover, there are no available conceptual frameworks to guide decision makers in formulating implementation strategies and to guide academicians in studying nurse-led ART delivery models. Consequently, little is known about the barriers and facilitators to the development and implementation of effective nurse-led ART clinics from the perspective of PLHIV, nurses, doctors, policymakers and other related key stakeholders, and about nurses' and doctors' competencies in ART delivery in the practice setting. Thus, there is need to develop a contextualised understanding of factors affecting the development and implementation of effective nurse-led ART clinics in the Ugandan natural practice settings. Such information will guide decision makers and managers of healthcare services to develop and implement more appropriate and effective nurse-led ART clinics in Uganda and other countries with similar needs. This information will also guide the development of a conceptual framework of factors influencing the development and implementation of effective nurse-led ART clinics. The study aim and objectives are presented next.

1.2 The Aim of this Study

The aim of this study was to identify facilitators and barriers to the development and implementation of effective nurse-led antiretroviral treatment clinics in Uganda.

1.3 The Objectives of this Study

1. To assess the patients' experiences with, and attitudes and views towards nurses as providers of antiretroviral treatment and the associated factors
2. To explore facilitators and barriers to the development and implementation of effective nurse-led antiretroviral treatment clinics based on the perceptions of nurses, doctors, professional nursing and medical councils, policymakers, and other related stakeholders
3. To determine nurses' and doctors' competencies in managing HIV-related disease conditions including the provision of antiretroviral treatment

4. To develop a conceptual framework of factors influencing the development and implementation of effective nurse-led antiretroviral treatment clinics
5. To propose strategies that could ensure the successful development and implementation of effective nurse-led antiretroviral treatment clinics based on the results of this study

1.4 Study Justification

An essential first step towards the successful development and implementation of effective nurse-led ART clinics is to understand the factors that influence the process. Informed decision-making based on reliable evidence about the local context, potential barriers and facilitators, and the effectiveness of the different strategies is essential when developing public health interventions (Garner, Kale et al. 1998, Chinnock, Siegfried et al. 2005, Labonte and Torgerson 2005, Oxman, Bjorndal et al. 2010). Policymakers need relevant evidence to choose appropriate strategies to ensure the success of nurse-led ART delivery models (Rashidian, Shakibazadeh et al. 2013, Rustagi, Manjate et al. 2015). However, the current literature provides limited guidance to policymakers, researchers, and practitioners about the factors influencing the development and implementation of effective nurse-led ART clinics in SSA in general (Samb, Celletti et al. 2007, Shumbusho, Griensven et al. 2009, Rashidian, Shakibazadeh et al. 2013, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016) and Uganda in particular (Baine and Kasangaki 2014). Consequently, there are no conceptual frameworks to guide development and implementation of effective nurse-led ART clinics, yet clear identification of factors influencing the success of these clinics may inform best practices. It follows, therefore, that if nurse-led ART clinics are to be successfully developed and implemented in Uganda, there is a need for proper understanding of structural issues, values, and preferences, among others presented by the different stakeholders, which may influence the effectiveness and sustainability of these clinics. If such issues or factors are not considered during the design, they might hamper the effectiveness of these clinics in actual practice.

Central to this study is Avedis Donabedian's (1985) statement that from the perspectives of the healthcare provider and the patient, a duality exists concerning the perception of quality of care, and both the health professionals' and the patients' perspectives must be examined to get an accurate picture of the quality of health care provided. Donabedian (1985) pointed out a severe lack of research available on this dual perspective of quality. More than thirty years later, this gap in the literature regarding the fit between healthcare systems and clients still exists, particularly in developing countries like Uganda. Likewise, the WHO Global Recommendation and Guideline on Task Shifting Number Two underscores the importance of consulting with key stakeholders including healthcare providers and patients while developing new healthcare worker roles. It states *“In all aspects concerning the adoption of task shifting, relevant parties should endeavour to identify the appropriate stakeholders, including PLHIV, who will need to be involved and consulted from the beginning”* [(WHO 2008b): page 2].

Despite the great need for nurses to take on expanded HIV tasks, there is limited information on patients' perceptions and their acceptability of nurses as providers of ART (Myburgh, Solanki et al. 2005, UNAIDS/WHO 2006, Guberski 2007, Iwu and Holzemer 2014, Mijovic, McKnight et al. 2016). Critical to developing a programme that will take care of the chronic management of HIV is that it must be designed to meet the needs and desires of those it is meant to serve (Kassirer 1994, Carroll, Sullivan et al. 1998, Coulter 2002, Mijovic, McKnight et al. 2016). Understanding how patients evaluate their care may help to identify deficiencies and inform improvements which will make healthcare programmes more patient-centred and efficient in the context of scarce resources (Wensing and Grol 2000, Wouters, Heunis et al. 2008). Patients' views on task shifting are critical because they may affect ART enrolment and the subsequent adherence to their medication (Golin, DiMatteo et al. 1996, Brown 2001, Bartlett 2002, Philips, Zachariah et al. 2008, O'Malley, Asrat et al. 2014). Patients' perceptions of the quality of care provided to them are particularly important because only contented individuals are more likely to adhere to their treatments (Wartman, Morlock et al. 1983, Davies, Ware et al. 1986, Ware and Hayes 1988, Andaleeb, Siddiqui et al. 2007), pursue follow-up care, and avoid resorting to negative word-of-mouth that dissuades others from seeking health care from the system (Hulka, Zyzanski et al. 1970, Kincey, Bradshaw et al. 1975, Larsen and Rootman 1976, Kitahata, Koepsell et al. 1996, Andaleeb, Siddiqui et al. 2007). Patients' perceptions of the competencies of the

healthcare provider and the subsequent contentment with care provided are also important in determining patients' choice of provider, including the decision to seek care at all and maintain a continuing relationship with their healthcare provider (Hertz and Stamps 1977, Linn, Linn et al. 1982, Marquis, Davies et al. 1983, Bartlett, Grayson et al. 1984, Kane, Maciejewski et al. 1997, Pilar, Massaquoi et al. 2007, Lantis, Green et al. 2008). Improving the sensitivity of ART delivery to PLHIV demands a good understanding of their expectations and priorities in care provision. Insight into patients' expectations in ART delivery will support decision-making on desirable models for care provision (Campbell, Scott et al. 2011). This study, therefore, sought to understand patients' perceptions, interests, and concerns with nurse-led ART clinics; such information is critical to the development of these programmes (Kassirer 1994, Carroll, Sullivan et al. 1998, Coulter 2002).

Equally important but lacking in Uganda, is the information on the potential facilitators and barriers to the development and implementation of effective nurse-led ART clinics. At the core of successfully developing and implementing such clinics is the extent to which the goals of these clinics are in alignment with those of stakeholders, who may become unsupportive if their concerns are not addressed (Miles, Seitio et al. 2006, Bryar, Kendall et al. 2012, Iwu and Holzemer 2014, Kredo, Adeniyi et al. 2014, Benton 2015, Rustagi, Manjate et al. 2015, Mijovic, McKnight et al. 2016). In the literature, it is apparent that stakeholders' perceptions on nurse-based task shifting have not been explored and consequently have not been considered in their design (Rajaraman and Palmer 2008, Iwu and Holzemer 2014). Therefore, it is also important to investigate these stakeholders' attitudes towards the changing boundaries of nurses' roles in HIV care. Understanding their concerns and reactions, particularly those of nurses and doctors towards the introduction of nurse-led ART clinics is critical since unmotivated healthcare workers can obstruct technically well-designed programmes thereby depriving populations of their potential benefits (Bennet and Franco 1999, Rustagi, Manjate et al. 2015). A better understanding of stakeholders' views on what ART-related tasks and which patient populations nurses should manage, would be useful in developing appropriate task shifting policies and support strategies.

Furthermore, there is a lack of evidence of nurses' competencies at providing ART in the Ugandan public health system without intensive donor support. Therefore, for a start, there is a need to determine nurses' competencies at providing ART in practice. In addition, it is important to study and understand if there are any domains of HIV clinical care in which nurses have the required competencies and if there are those at which they will need to be trained to enable them to provide quality and safe care and treatment. Thus, this study also assesses and compares the competencies of nurses and doctors in delivering ART.

Important also is the observation that nurse-led ART clinics have been introduced inconsistently, which can largely be attributed to a lack of conceptual and methodological standards to guide their development and implementation. Without this conceptual and methodological guidance, the results of studies meant to influence practice have limited applicability and validity as their evidence falls short of providing a complete understanding of the facilitators and barriers to the introduction of effective nurse-led ART clinics (Crowley and Mayers 2015). The need for a complete understanding of the factors and the mechanism through which they influence the development and implementation of effective nurse-led ART clinics is important as investing in the establishment of these clinics is cost-prohibitive for most countries in SSA (Lehmann, Van-Damme et al. 2009). Thus, this study seeks to develop a conceptual framework to guide the development and implementation of effective nurse-led ART clinics, as well as to guide future research.

Concisely, this study is meant to fill the knowledge gap by providing insight into the factors influencing the development and implementation of effective nurse-led ART clinics from multiple dimensions and perspectives. This information will guide policy formulation and appropriate designs to ensure that nurse-led ART clinics are effectively and sustainably developed and implemented in Uganda and other resource-constrained settings. The literature review of the factors influencing the development and implementation of effective nurse-based task shifting programmes is discussed in the next chapter.

2 Literature Review on Factors Influencing the Development and Implementation of Nurse-Based Task Shifting Programmes

2.1 Introduction

This chapter presents a literature review on factors acting as facilitators and barriers to the development and implementation of effective nurse-based task shifting for HIV services in Uganda and elsewhere in SSA. However, due to the scarcity of literature on this subject in Uganda and elsewhere in SSA, literature from industrialised countries that have progressed significantly in the development of nurse-based task shifting for various healthcare services is reviewed as well. Lessons from these countries are useful for developing countries, which need to adapt their systems rapidly to deliver essential health services made worse by the HIV epidemic and the emergence of non-communicable diseases amidst severe human resource shortages. Some of the industrialised countries worth looking at more closely, particularly regarding how their nurses in expanded clinical roles have evolved with increasing clinical authority, autonomy, and accountability in nursing practice, include the United States of America (USA), Canada, and the United Kingdom (UK). These countries began to formally implement nurses' expanded clinical roles way back in the 1960s and 1970s and present important lessons about barriers and facilitators to nurses' expanded clinical roles for Uganda as it plans to develop and implement the nurse-led ART delivery model. However, these lessons must be explored with the usual caution of generalising results from different contexts.

Therefore, in this chapter, literature on nurse-led task shifting for HIV services from resource-limited settings, particularly from SSA, is interposed with the literature on general nurse-based task shifting from industrialised countries to develop the preliminary conceptual framework (discussed in Section 4.2) that guided this particular study. The facilitators and barriers to nurse-based task shifting for HIV service delivery in SSA (Shumbusho, Griensven et al. 2009, Zachariah, Ford et al. 2009, Fulton, Scheffler et al. 2011, Emdin and Millson 2012, Fairall, Bachmann et al. 2012, Rashidian, Shakibazadeh et al. 2013, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016) are in many ways similar to those identified in international reviews (Lloyd 2005, Delamaire and Lafortune 2010, Niezen and Mathijssen 2014). As highlighted in the preliminary conceptual

framework, these studies and reviews have broadly categorised barriers and facilitators to nurse-based task shifting as those related to the patient and community, policy and funding, wider health system, healthcare facility, and personal nurse environments. This study has adopted those categorisations to guide the literature review process. The next sections present the review, starting with the literature on factors related to the patient and the community.

2.2 Patient and Community Factors

The literature emphasises the importance of the broader societal context, particularly the demand for health services amidst a severe shortage of doctors to provide them, community and patients' attitudes towards nurses as providers of expanded clinical services, and the perceived complexity of illness, in influencing the effectiveness of nurse-based task shifting initiatives (Assefa, Kiflie et al. 2012, Iwu and Holzemer 2014, Crowley and Mayers 2015). The literature on the effect of the high demand for services amidst the shortage of doctors to provide them on the effectiveness of nurse-based task shifting initiatives is discussed in the next section.

2.2.1 High Demand for HIV Services amidst Few Doctors

Several studies on task shifting in SSA have revealed that the severe shortage of doctors and the high demand for HIV services has resulted in nurse-based task shifting at various levels of the healthcare systems and in different forms (Babigumira, Castelnuovo et al. 2009, ECSA-HC 2010, Dambisya and Matinhure 2012, Baine and Kasangaki 2014, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016, Spies, Gray et al. 2016). The literature on the effect of community and patients' attitudes towards healthcare workers on the effectiveness of task shifting initiatives is discussed in the next section.

2.2.2 Community and Patients' Perception of Nurses as Providers of Expanded Clinical Services

Community and patients' perception of quality of care and their subsequent satisfaction with the care they receive have been recognised as an important factor in measuring the quality of healthcare services and a contributor to outcomes of care (Donabedian 1987, Davies and Ware 1988, Barbosa, Balp et al. 2012). Patients' decisions to utilise services

are impacted by the quality of care they believe they will receive, with some studies showing that more satisfied patients exhibit better adherence to medications (Bartlett, Grayson et al. 1984, Hazzard, Hutchinson et al. 1990, Roberts 2002, Schneider, Kaplan et al. 2004, Mullan and Frehywot 2007, Scheil-Adlung and Bonnet 2011, Tateke, Woldie et al. 2012). Quality of care from the perspective of receivers is being used increasingly to evaluate healthcare providers (Atkinson 1993, Shreffler-Grant 2006), because if the patients' perception of quality of care is positive, they are likely to accept the services provided by the healthcare worker (Penchansky and Thomas 1981, Studner and Hirsch 1986, Shreffler-Grant 2006).

Studies in SSA have found nurse-based task shifting for HIV services acceptable to most patients (Georgeu, Colvin et al. 2012, Assefa, Alebachew et al. 2014, Iwu and Holzemer 2014). The acceptance of nurses in expanded HIV clinical roles has resulted mainly from their ability to improve access to care, reduce patient waiting time, and reduce travel costs and time as they provide ART nearer to patients' homes (Georgeu, Colvin et al. 2012, Iwu and Holzemer 2014). Patients in South Africa (Boyer, Protopopescu et al. 2011) and Ethiopia (Assefa, Kiflie et al. 2012), preferred care at primary healthcare facilities and district management units because of better relationships they had with the providers based at those levels than they had with those at higher levels. These patients rated these healthcare providers as friendlier, more supportive, better at giving time for thorough examination, and better providers of patient education. Likewise, O'Malley, Asrat et al. (2014), in their study in Namibia to assess the feasibility of a task shifting of ART initiation from doctors to nurses, found that thirty-eight of the thirty-nine patients interviewed favoured task shifting because they did not anticipate any negative changes in the quality of care they would receive from nurses in expanded HIV clinical roles. To the contrary, they appreciated task shifting because it would reduce waiting time and the time spent travelling to the healthcare facility and improve communication between patients and healthcare workers since nurses, more than doctors, spoke the patient's language (O'Malley, Asrat et al. 2014).

However, Mukora, Charalambous et al. (2011) and Georgeu, Colvin et al. (2012) in their studies in South Africa, found that some patients opposed nurse-based HIV task shifting because of stigma and discrimination since with these clinics, patients are managed

within their neighbourhood where they are known. Similarly, Patterson, Russell et al. (2007) in their review of the experiences of PLHIV with professional healthcare workers, found that participants in focus groups generally had negative assessments of their treatment by nurses related to nurses' breaches of confidentiality, nurses' stigmatising and rude behaviour, and patients' lack of confidence in nurses' medical training and knowledge. These negative experiences led to misgivings among some community members about nurses taking on expanded clinical roles such as prescribing antiretroviral (Patterson, Russell et al. 2007). Interestingly, some respondents acknowledged that the rude treatment they experienced from nurses could have been the result of extreme stress due to nursing shortages, poor pay and poor working conditions, suggesting that improving their motivation, remuneration and working conditions would improve the attitude of nurses (Patterson, Russell et al. 2007).

The WHO (2006a) has recommended that the selection criteria for healthcare providers for task shifting should include a focus on the compatibility between healthcare workers and clients in such areas as gender, language, ethnicity and geography. While the literature contains little data on this issue, Buchan and O'May (2000) have advised that societal and cultural values need to be considered during any skill mix changes. For example, in cultures where women do not want to see a male provider for reproductive health services, a shortage of female providers can create problems (Creel, Sass et al. 2002). The literature on the effect of community and patients' perceived complexity of the illness on the effectiveness of nurse-based task shifting is discussed in the next section.

2.2.3 Perceived Complexity of Illness by the Community and Patients

Studies indicate that the complexity of the illness is an important factor in the acceptance of nurses as providers of expanded clinical services (Fletcher, Baker et al. 2007, Brodsky and Van-Dijk 2008, Van-Offenbeek, Sorge et al. 2009). The less complex the illness, the more positive the attitude towards nurses providing the services (Pioro, Landefeld et al. 2001, Fletcher, Baker et al. 2007, Brodsky and Van-Dijk 2008, Van-Offenbeek, Sorge et al. 2009). Nurses are more acceptable to stakeholders if they provide routine rather than the non-routine clinical services (Van-Offenbeek, Sorge et al. 2009). It is assumed that less complex, more routine, cure-oriented tasks offer scope for formalisation and task

reallocation from the medical to the nursing domain (Van-Offenbeek, Sorge et al. 2009). In an integrative qualitative review to explore the benefits and limitations of the expansion of clinical roles among nurses working in general practice in the UK Rashid (2010), patients wanted nurses to deal with simple conditions, but preferred to consult with a general practitioner if they thought it necessary. The literature on the effect of policies and funding on nurse-based task shifting is discussed in the next section.

2.3 Policies and Funding Factors

Legislation, regulation, and funding are critical to the successful development and implementation of nurse-based task shifting. The literature on the importance of legislation and regulation in task shifting is discussed first.

2.3.1 Legislation and Regulation

Legislation results in laws which, in turn, are translated into rules, regulations, policies and guidelines used by regulatory bodies to regulate the practice of healthcare professionals (McCarthy, J.Voss et al. 2013). Health professional regulation ensures the safety and quality of health professional practice and education (Walshe 2003, ICN 2009, ICM 2011). Healthcare legislation and regulation are meant to ensure accountability for the safety of clients and the protection of healthcare workers (Sutherland and Leatherman 2006, Dubois, Dixon et al. 2007). However, McCarthy, Voss et al. (2013) in a study of nursing and midwifery regulation and HIV scale-up in 13 countries in East, Central and Southern Africa, found that existing legislation and regulations did not support nurses' expanded roles in HIV care. Consequently, the introduction of nurse-led ART clinics in SSA has contradicted existing laws and regulations about who provides which type of healthcare service to which patients (Miles, Clutterbuck et al. 2007, Zachariah, Ford et al. 2009, McCarthy, J.Voss et al. 2013). Task shifting for HIV services in most countries in SSA has occurred as an impromptu response to need without making the necessary legislative changes (Dovlo 2004, Hirschhorn, Oguda et al. 2006, Crowley and Mayers 2015). With such informal task shifting, various new cadres with vague or overlapping responsibilities, which are often questioned by existing staff, policymakers, and patients, have been created (Dovlo 2004). The absence of government policies and regulations to support nurses in expanded clinical roles contributes to the ad hoc introduction of roles, inconsistent role

development, inadequate resources, and limited opportunities for planned change and innovation, and has implications for the safety and quality of patient care (Cameron & Masterson 2000, Guest et al. 2001). In addition to those limitations, the absence of supportive legislation deters healthcare workers from taking on additional tasks outside their scopes of practice for fear of litigation should a mishap happen during their duties, in the absence of legal protection (Baine and Kasangaki 2014, AMREF 2015).

Although WHO has advised that countries could expedite the implementation of task shifting through other existing policies and changes in strategic plans to permit task shifting, it is vital that appropriate legislation is in place for resource mobilisation and planning (WHO/PEPFAR/UNAIDS 2007). In the absence of supportive legislation, task-shifting programmes have encountered inadequate systems support to ensure their successful implementation (Crowley and Mayers 2015). Legislation and regulation permit task shifting that ensures the safety of patients and healthcare workers, and acts as an advocacy tool for resources necessary to provide good working conditions such as tools, equipment, and commensurate salaries for nurses in expanded roles (WHO/PEPFAR/UNAIDS 2007). Legislation should define issues such as educational preparation, the protection of professional titles, regulation of healthcare workers, competencies, prescriptive authority, and remuneration (WHO/PEPFAR/UNAIDS 2007, Zuber, McCarthy et al. 2014). To allow nurses in expanded roles to practice autonomously to their full scope, the WHO and numerous studies have advised countries to invest in legislation and regulation to ensure that task-shifting interventions are sustainable (WHO/PEPFAR/UNAIDS 2007, Mwai, Mburu et al. 2013, Assefa, Pillay et al. 2014, McCarthy, Kelley et al. 2014, Zuber, McCarthy et al. 2014, Crowley and Mayers 2015). The literature on the effect of funding on the success of task shifting is discussed next.

2.3.2 Funding and Cost Implications of Task Shifting

There is unanimous agreement in the literature that any long-term success of task shifting initiatives will require significant financial commitments not only for remuneration but also for training, supervision and infrastructure support development (Campbell and Scott 2009, Lehmann, Van-Damme et al. 2009, Lanktree, Corluka et al. 2014). Indeed, Samb, Celletti et al. (2007) and Callaghan, Ford et al. (2010) have argued that task

shifting requires careful attention to organisation, structure and resourcing of health services with broader health system strengthening interventions to ensure its sustainability. Lehmann, Van-Damme et al. (2009), have also noted that funding is particularly critical since task-shifting initiatives target majorly remote, hard-to-reach, severely under-resourced areas with severe infrastructure limitations. Samb, Celletti et al. (2007) have advised poor governments to work with development partners to help prepare health systems to implement task shifting successfully by ensuring the availability of funding for the development of appropriate regulatory frameworks, training, and building the management capacity, among others. However, despite the concerns of increasing operational costs associated with task shifting, Callaghan, Ford et al. (2010) and Mdege, Chindove et al. (2013), in two separate systematic reviews on task-shifting in the delivery of ART to HIV-infected patients in SSA, found that shifting tasks from doctors to nurses, or from healthcare professionals to lay health workers, reduced costs of ART provision without necessarily compromising health outcomes for patients.

Numerous empirical studies have associated substantial cost and physician timesaving to task shifting (Chung, O'Brien et al. 2008, Babigumira, Castelnuovo et al. 2009, Jaffar, Amuron et al. 2009). However, these reduced costs associated with task shifting should be taken cautiously since Chung, O'Brien et al. (2008) in Rwanda did not explore the effects of task shifting on overall system-wide costs of providing ART, and Babigumira, Castelnuovo et al. (2009) in Uganda did not include start-up and operational costs such as training and supervision. Omitting operational costs is critical since training and mentoring for task shifting can be time- and resource-intensive (Morris, Chapula et al. 2009). The literature on wider health system factors that influence the development and implementation of nurses' expanded roles is discussed next.

2.4 Wider Health System Factors

Studies in both SSA and industrialised countries have identified wider health system factors that influence the development and implementation of expanded nurse clinical roles to include national leadership, systematic planning, stakeholder involvement, job descriptions, pre-service education and in-service training, mentorship and support supervision, and remuneration (Dunn and Nicklin 1995, Schreiber, Davidson et al. 2003,

Micevski, Korkola et al. 2004, Bryant-Lukosius, DiCenso et al. 2004a, Lehmann, Van-Damme et al. 2009, Shumbusho, Griensven et al. 2009, Delamaire and Lafortune 2010). The literature on each of these factors is discussed in this section, starting with the role of national leadership and political commitment.

2.4.1 National Leadership and Political Commitment

Lehmann, Van-Damme et al. (2009) and Schneider, Coetzee et al. (2010) have identified national leadership and political commitment as the most important factor affecting the successful development and implementation of task shifting programmes in Africa. Lehmann, Van-Damme et al. (2009) mentioned that a vigorous and committed leadership from the national government is critical in ensuring that an enabling regulatory framework and credentialing systems are in place to drive the implementation of task shifting. Lehmann, Van-Damme et al. (2009) also emphasised the importance of government leadership in establishing policies, engaging stakeholders, supporting training, and providing adequate resources for effective task shifting. Strong national leadership is necessary for developing the relevant policies, providing the necessary resources, guiding and monitoring the implementation process and supporting training institutions to upgrade their training, while ensuring that pre-service education and in-service training are reformed to take care of the new required competencies for nurses taking up expanded roles in HIV care (Shumbusho, Griensven et al. 2009). National leadership is also critical in ensuring from the outset coordination and consultation with the principal regulatory bodies such as medical and nursing councils, as well as with relevant government ministries of health, education and labour (Zachariah, Ford et al. 2009).

A good example of the critical role played by national leadership in ensuring the success of task shifting is drawn from the Rwanda experience where, in 2005, the government enacted the necessary legal frameworks to enable nurses to manage ART initiation and patient follow-up in the face of a severe shortage of doctors (Shumbusho, Griensven et al. 2009). An evaluation of this intervention in 2008 showed that patient outcomes in the Rwanda public programme compared favourably with those of other smaller resource-intensive ART cohorts in SSA (Shumbusho, Griensven et al. 2009). The researchers concluded that with good national leadership, nurses could effectively and safely

prescribe ART when given adequate training, mentoring, and system support (Shumbusho, Griensven et al. 2009). The literature on the importance of systematic planning in developing and implementing effective nurse-led ART clinics is discussed next.

2.4.2 Systematic Planning to Guide Expanded Nurse Role Development

Carter, Martin-Misener et al. (2010) in Canada have identified the use of a systematic process to assess patient and community needs and early stakeholder involvement as key enablers to expanded nurse role development and implementation. Literature in countries such as Canada and the UK (Dunn and Nicklin 1995, Alcock 1996, Cameron and Masterson 2000, Bryant-Lukosius, DiCenso et al. 2004a, Carter, Martin-Misener et al. 2010) and in SSA (Zachariah, Ford et al. 2009) is replete with examples of new nurse roles introduced hurriedly in response to severe HRH shortages, often without systematic needs assessments to determine what expanded nurses' roles are required. This ad hoc introduction has led to the development of expanded nurse roles without clearly defined goals resulting from an assessment of local healthcare needs (Guest, Peccei et al. 2001, Read, Jones et al. 2001, Bryant-Lukosius, DiCenso et al. 2004a). In the absence of clearly defined goals, nurses' expanded roles are determined by the expectations of the different stakeholders, doctors, managers, other healthcare providers, and nurses in the role (Guest, Peccei et al. 2001, Read, Jones et al. 2001, Bryant-Lukosius, DiCenso et al. 2004a). Direct results of these varying expectations are confusion, role conflict, role overload and variable acceptance of nurses' expanded roles (Soeren, Hurlock-Chorostecki et al. 2009, Sangster-Gormley, Martin-Misener et al. 2011). Clear goals of expanded nurse roles lead to clarity about how nurses in expanded roles will work with other healthcare providers, what type of service they will provide, and to what patient population these nurses will give care (Goss-Gilroy-Inc 2001, van-Soeren and Micevski 2001, Cummings, Fraser et al. 2003, DiCenso, Paech et al. 2003, Stolee, Hillier et al. 2006, Thrasher and Purc-Stephenson 2007, Martin-Misener, Downe-Wamboldt et al. 2009).

DiCenso, Paech et al. (2003) also in Canada found the use of teams to define expanded nurse role expectation allowed collective identification of patient needs and facilitated a common understanding and readiness for the new roles by all stakeholders. Clear

identification of goals of expanded nurse roles also assists in the development of position descriptions and guidelines about how nurses in expanded roles should function in the team (Goss-Gilroy-Inc 2001, DiCenso, Paech et al. 2003, DiCenso, Auffrey et al. 2007). To avoid role confusion and ensure the successful development and implementation of expanded nurse roles, national ministries of health and healthcare facilities planning to introduce expanded nurse roles, should first conduct a systematic assessment of patient or community needs to gain a clear understanding of their health needs (Dunn and Nicklin 1995, Bryant-Lukosius, DiCenso et al. 2004a). The identified needs should then form the basis for developing expanded roles that nurses will be required to perform (Dunn and Nicklin 1995, Bryant-Lukosius, DiCenso et al. 2004a). A framework for the development, implementation, and evaluation of advanced practice nursing roles such as the one developed in Canada could be a useful planning tool to facilitate expanded role development and implementation, including a guide to expanded nurse role implementation (Bryant-Lukosius and Dicenso 2004, Bryant-Lukosius, DiCenso et al. 2004a). The outcome of planning should include expanded role definition and expectations, goals for the expanded roles, and a plan for how to implement these roles (Bryant-Lukosius and Dicenso 2004, Bryant-Lukosius, DiCenso et al. 2004a). The literature on the importance of stakeholder involvement in enhancing the effectiveness of expanded nurse roles is discussed next.

2.4.3 Stakeholder Involvement

Sangster-Gormley, Martin-Misener et al. (2011) have defined stakeholder involvement as the active participation of stakeholders in the early stages of expanded nurse role development and implementation. The inclusion of stakeholders allows everyone to gain a shared understanding and vision for the expanded nurse roles, which helps to guide the implementation process (Sangster-Gormley, Martin-Misener et al. 2011). A shared understanding of the expanded nurse roles fosters alignment of these roles with patient needs and forestalls conflict among stakeholders (DiCenso, Paech et al. 2003, DiCenso, Auffrey et al. 2007). Because task shifting represents a major change in the way health services are delivered by the workforce and the way service users experience the provision of health services, the support of stakeholders who affect and those who are affected by these changes is critical to its successful implementation (Zachariah, Ford et al. 2009).

There is evidence that broad consultation of stakeholders is required when implementing health care reforms if these changes are to be accepted and supported by all concerned parties (WHO 2003c, OECD 2005). Studies have identified professional bodies and associations; trade unions; ministries of health, education, finance and public service; non-governmental and community organisations; local health structures; healthcare workers; and, service users including PLHIV, as the key stakeholders whose views should be sought to ensure the successful development and implementation of task shifting initiatives (WHO 2007c, McPake and Mensah 2008). Other identified key stakeholders include patients' families, advocacy groups, volunteer agencies, healthcare organisations, the healthcare team, professional associations, support staff, administrators, educators and government agencies involved in health policy and funding (Bryant-Lukosius, DiCenso et al. 2004a). Key stakeholders in decisions regarding task shifting include government regulatory bodies such as ministries of health, education and finance, and professional associations (B.Sibbald, J.Chen et al. 2004). Developing strategic partnerships with these groups of stakeholders at the very beginning of the task shifting process is essential because they are mandated to create or revise scopes of practice, spell out job descriptions, layout entrance criteria, licensing and certification requirements, and address policy and legal issues (B.Sibbald, J.Chen et al. 2004). In resource-poor countries, an important group of stakeholders are donors who finance a significant proportion of the national HIV control programmes, such as for the Uganda case (UAC 2012, UAC 2015).

Cummings and McLennan (2005) have argued that stakeholder participation at the onset of expanded nurse role development is critical in ensuring their commitment to and provision of support for planned change, noting that even though it lengthens the process. Stakeholder consultation and active engagement help in building partnerships that create shared responsibility and support for the task-shifting approach (Cummings and McLennan 2005, Lehmann, Van-Damme et al. 2009, Sangster-Gormley, Martin-Misener et al. 2011). These authors also noted stakeholder involvement to include community sensitisation and education of service users to create acceptance among patients and others with common unmet health-care needs, the health workforce, and the public.

On the other hand, the lack of stakeholder involvement contributes to lack of role clarity, often leading to confusion about the expanded nurses' roles, conflict, and stakeholders' lack of support for these roles (Sangster-Gormley, Martin-Misener et al. 2011). When stakeholders are not involved, there is no buy-in from them and task shifting only exists on the political and organisational periphery of the formal health system which is then exposed to policy changes and funding cuts in times of resource scarcity (Lehmann, Van-Damme et al. 2009). Indeed, failures of new promising health reforms have been traced back to poor stakeholder consultation (OECD 2005). Expansion of primary health care as conceptualised in 1978, in Alma Ata, resulted in sub-optimal results because of failure to fully engage key stakeholders from the outset (WHO 1978, Dovlo 2004). In Uganda, the MoH introduced the nursing assistant cadre without proper consultation with the UNMC, which later refused to recognise it (ECSA-HC 2010a). This cadre was found to practice without regulation and professional oversight, posing a potential danger to patients who could receive sub-standard services, and to nursing assistants themselves who could face litigation if any mishap happened to patients resulting from their work (ECSA-HC 2010a). In Ethiopia, unlike in Uganda, the creation of a new community healthcare cadre was preceded by consultation with stakeholders which led to their smooth establishment within the civil service (WHO 2007c). The literature on the importance of appropriate job descriptions in supporting nurses to take up expanded roles is discussed next.

2.4.4 Job Descriptions

A job description is a form of agreement between an organisation and its employees highlighting the employers' expectations and priorities as well as the professional values expected of employees (Sidani and Irvine 1999, Stenmark 2000, Ducey 2002, Levin and Weiss-Gal 2009, Mafuba 2012). Job descriptions form the foundation for understanding job functions, responsibilities, accountability, and authority for both the employer and the employee (Forchuk, Ouwerkerk et al. 2002).

Job descriptions also define the levels of authority granted to individual healthcare workers or groups within the healthcare team. For instance, job descriptions define for

healthcare workers the skills and qualifications necessary to carry out the responsibilities assigned to them, clarify when they should refer patients to a more appropriate cadre, and communicate the expectations of the employer and formal instructions for responsibilities to the employee (Lehmann, Friedman et al. 2004, Abbat 2005, Wick 2007, Lehmann, Van-Damme et al. 2009). Job descriptions provide a shared understanding of tasks and responsibilities, thereby avoiding conflicts in work environments where roles and responsibilities overlap (Torrington, Hall et al. 2002). Since task shifting by its very nature involves changing healthcare workers' roles and responsibilities, rewriting job descriptions is a critical precondition for the success of these initiatives (WHO/PEPFAR/UNAIDS 2007).

In SSA, overlapping roles have occurred when new roles have been assigned to healthcare workers with unclear job descriptions or when their job descriptions have not been updated to accommodate their new roles and responsibilities (Lehmann, Friedman et al. 2004, Abbat 2005, Lehmann, Van-Damme et al. 2009), often resulting in role ambiguity and conflict among the health team members since some tasks become the responsibility of many people. Consequently, these tasks have at times been neglected in the absence of clear communication, and healthcare workers have found themselves in conflict with those they have felt are undermining them by encroaching on their work (ECSA-HC 2010b). Studies have recommended that clear job descriptions be developed for nurses in expanded HIV clinical roles to foster clarity of their roles amongst themselves and other stakeholders (Lehmann, Friedman et al. 2004, Abbat 2005, Lehmann, Van-Damme et al. 2009). Clarity of roles and responsibilities to employees is important, as it enhances their effectiveness and efficiency in executing their duties (Lehmann, Friedman et al. 2004, Abbat 2005, Lehmann, Van-Damme et al. 2009). The literature on the role pre-service education and in-service training play in enabling nurses to take up expanded roles is discussed next.

2.4.5 Pre-Service Education and In-Service Training

Several studies have highlighted the critical role pre-service education and in-service training of nurses play in enabling nurses to acquire the necessary knowledge, skills and confidence to execute expanded HIV clinical roles including ART prescription for initiation (O'Brien, N et al. 2001, Koenig, Leandre et al. 2004, WHO 2004, WHO 2005a,

Ford, Reuter et al. 2006, Bedelu, Ford et al. 2007, Bolton-Moore, Mubiana-Mbewe et al. 2007, WHO 2007a, WHO 2007b, WHO 2007c, Chopra, Munro et al. 2008, Shumbusho, Griensven et al. 2009, Zachariah, Ford et al. 2009, Callaghan, Ford et al. 2010, Georgeu, Colvin et al. 2012). In a systematic review of task-shifting for HIV treatment and care in Africa, Callaghan, Ford et al. (2010) highlighted the importance of education and ongoing training in enabling lower healthcare cadres to acquire the necessary clinical reasoning skills to meet the medical challenges of HIV-positive patients. Speciality education for nurses has been found to significantly improve their self-confidence and job satisfaction (Bryant-Lukosius, Green et al. 2007) and to enable nurses to solve complex problems encountered in their expanded roles (Richmond and Becker 2005).

However, nurses' pre-service education and in-service training have been found inadequate in building the required competencies and confidence of nurses taking up advanced clinical roles in HIV care (Dovlo 2004, Zachariah, Ford et al. 2009). Others have raised issues of inadequate funding for both pre-service education and in-service training as a significant barrier to task shifting, reasoning that a substantial amount of funding will be needed to develop a pool of competent healthcare workers, including nurses, to support this intervention (Mwai, Mburu et al. 2013, Assefa, Pillay et al. 2014, McCarthy, Kelley et al. 2014, Zuber, McCarthy et al. 2014).

In their study on the effects of task shifting for HIV from the perspective of systems thinking in Burkina Faso, Bocoum, Kouanda et al. (2013) identified various training issues such as inadequate funding for the training and a high turnover rate of healthcare workers, including those who had received the training. Furthermore, the training was questionably too short, had the same duration for all types of cadre being trained irrespective of their varied needs, had no planned component for refresher training, and ignored the element of follow-up after training, even when it was envisioned as crucial for reinforcing the skills learned in class in Burkina Faso's task-shifting strategy (Bocoum, Kouanda et al. 2013). In Mozambique, the MoH two-week in-service course, meant to equip non-physician clinicians with knowledge and skills necessary to provide high-quality clinical HIV/AIDS services, was found inadequate as it did not emphasise important components of HIV care like clinical staging and the management of

opportunistic infections, which resulted in deficiencies in the quality of care provided to patients (Brentlinger, Assan et al. 2010).

Studies have recommended competence-based training, designed to address the expanded roles of lower-level healthcare cadres, as opposed to theoretical training, to ensure that they acquire the necessary knowledge and skills (Griensven, Naeyer et al. 2008, I-TECH 2008, N.E.C.G.Davies, M.Homfray et al. 2013). An example of such competence-based training is the IMAI developed by WHO and adapted by many countries in SSA, including Uganda (Vasan, Ellner et al. 2014). Another example is the HIV/ART Nurse Specialists' training developed by the International Training and Education Centre (I-TECH) in Ethiopia which is used to develop critical thinking skills among nurses to become ART Nurse Specialists able to take on a more active and central role in ART scale-up efforts, including prescriptions (I-TECH 2008). The training is likely to be successful if it is well-funded and there are clear job descriptions that define the new tasks that the trained cadre will be expected to perform (Brentlinger, Assan et al. 2010). Furthermore, in-service training is successful when a high proportion of the available time is allocated to practice skills, and the initial training is supplemented by opportunities for continuing education (Brentlinger, Assan et al. 2010). The literature on the role of mentorship and support supervision in supporting nurses to execute expanded roles is discussed next.

2.4.6 Mentorship and Support Supervision

The importance of ongoing clinical mentorship and support supervision in ensuring that nurses in expanded HIV clinical roles develop the necessary competencies, confidences, and motivation to provide clinical services to HIV-positive patients, including ART prescription for initiation, is emphasised by studies on task shifting in SSA (Morris, Chapula et al. , Stringer, Zulu et al. 2006, Bedelu, Ford et al. 2007, Chopra, Munro et al. 2008, Griensven, Naeyer et al. 2008, Hulela, Puvimanasinghe et al. 2008, Busmann, Ndwapi et al. 2009, Shumbusho, Griensven et al. 2009, Zachariah, Ford et al. 2009, Zachariah, Ford et al. 2009, Decroo, Telfer et al. 2011, Georgeu, Colvin et al. 2012, Green, Azevedo et al. 2014, O'Malley, Asrat et al. 2014, Fairall, Bachmann et al. 2012b). Small-scale task-shifting projects are often successful because they establish

effective support and supervisory mechanisms for lower cadres (Sanders 1992, Bhattacharyya, Winch et al. 2001, Bedelu, Ford et al. 2007).

However, many task shifting initiatives in SSA national programmes have encountered difficulties in offering effective mentorships and support supervision to lower-level healthcare cadres in expanded roles (Stringer, Zulu et al. 2006, Bedelu, Ford et al. 2007, Miles, Clutterbuck et al. 2007, Griensven, Naeyer et al. 2008, Hulela, Puvimanasinghe et al. 2008, Van-Griensven, De-Naeyer et al. 2008, Bussmann, Ndwapi et al. 2009, Morris, Chapula et al. 2009, Shumbusho, Griensven et al. 2009, Zachariah, Ford et al. 2009, Georgeu, Colvin et al. 2012, Munga, Kilima et al. 2012, Davies, Homfray et al. 2013, Emdin, Chong et al. 2013, Nyasulu, Muchiri et al. 2013, O'Malley, Asrat et al. 2014). The challenges encountered to providing mentorships have included the absence of communication facilities such as telephone and internet services for the mentors to provide distant online mentorships, insufficient time for the mentors, extensive distances between healthcare facilities, which makes it difficult for mentors to reach them, and differing staffing levels among healthcare facilities, which make standardised mentorship programmes problematic (Gilson, Walt et al. 1989, WHO 1990, Gray and Strasser 1999). These difficulties have been attributed mainly to inadequate planning, inadequate numbers of experienced and motivated mentors, and lack of transport for the mentors to travel to the remote healthcare facilities (Gilson, Walt et al. 1989, WHO 1990, Gray and Strasser 1999).

The lack of supportive supervision, mentorships, and opportunities for professional and career development adversely affect staff morale, motivation, and job satisfaction (Rowe, Savigny et al. 2005). Some authors have advised that countries considering the implementation of the task-shifting strategy should identify and test suitable models of mentoring and supervision such as the phone consultation model used at the AIDS Treatment Information Centre in Uganda (Chang, Kagaayi et al. 2008, Ario 2014). This model of mentorship may be feasible if personal mentoring is not possible due to huge distances between facilities or between over-stretched doctors (Chang, Kagaayi et al. 2008). Some countries with severe shortages of doctors, such as Ethiopia, have implemented senior-nurse-to-junior-nurse mentoring models with positive results (O'Malley, Asrat et al. 2014). However, supportive supervision and mentorships are only

effective in building lower cadres' competencies, self-confidence, and motivation when other forms of support, management, other healthcare professionals, commensurate remuneration, supplies, and infrastructure are available (Zachariah, Ford et al. 2009, Crowley and Mayers 2015). The next section examines the literature on the effect of remuneration on task shifting.

2.4.7 Commensurate Remuneration

The non-commensurate remuneration to lower-level healthcare cadres with extra skills, who take on expanded roles and other undesirable working conditions are major barriers to task shifting (Schneider, Hlophe et al. 2008, Ferrinho, Sidat et al. 2012, Munga, Kilima et al. 2012, Mwai, Mburu et al. 2013, Baine and Kasangaki 2014, Crowley and Mayers 2015). Some studies have reported that nurses and lay workers have taken on additional roles in HIV care without commensurate remuneration (Emdin, Chong et al. 2013, Mwai, Mburu et al. 2013) and with no incentives or career pathways (Schneider, Hlophe et al. 2008, Ferrinho, Sidat et al. 2012, Munga, Kilima et al. 2012, Mwai, Mburu et al. 2013, Baine and Kasangaki 2014, Crowley and Mayers 2015). In SSA, failure to recognise and reward those with additional competencies and those who take on extra tasks has been found to be a significant barrier to task shifting (Crowley and Mayers 2015). Healthcare workers have questioned why they should bother themselves with further studies and take on new responsibilities at the same pay and in the same positions they occupied before undertaking extra studies (Zachariah, Ford et al. 2009). Indeed, HIV work has resulted in a major increase in nurses' workloads in many countries in SSA but without commensurate improvement in salary or working conditions (Lynch, Lethola et al. 2008). In a study in Uganda, nurses resisted task shifting because they viewed it as a manoeuvre by the government to avoid paying the right people to do their rightful jobs by opting for cheaper solutions (ECSA-HC 2010).

Because lack of recognition and reward for those with extra competencies is a major barrier to task shifting, Zachariah, Ford et al. (2009) have advised that payment must be linked to the level of responsibility and increasing workload associated with task shifting if the long-term viability of task shifting initiatives is to be ensured. In the absence of funds for financial incentives, the use of non-financial incentives may be more appropriate. Examples of non-financial incentives which include the use of token

benefits such as certificates of excellence in ART delivery in Malawi (Libamba, Makombe et al. 2005) and the Yellow Star award programme in Uganda (Egger and Ollier 2007) that recognise performance according to set standards which are highly appreciated by health staff as indicators of official recognition may come in handy. Zachariah, Ford et al. (2009) have further argued that introducing mechanisms to advance professionally is essential in motivating lower cadres of healthcare workers in task-shifted roles since the qualifications of these substitute healthcare workers may not be accredited by universities. The literature review on how factors within the healthcare facility environment influence the success of nurse-led ART clinics is discussed next.

2.5 Healthcare Facility Factors

Previous research has identified factors within the healthcare facility environment that act as facilitators or barriers to the successful development and implementation of nurses' expanded roles to include: organisational culture, workload, role clarity, managers' support, clinical guidelines and protocols, referral systems, infrastructure, attitudes to task shifting, teamwork, and doctors' support (Goss-Gilroy-Inc 2001, Soeren and Micevski 2001, Cummings, Fraser et al. 2003, DiCenso, Paech et al. 2003, Stolee, Hillier et al. 2006). A closer examination of the literature on each of the main factors follows, starting with organisational culture.

2.5.1 Organisational Culture

Organisational culture that values professional work and stresses clinical expertise, and in which the management is willing to support nurses to take up expanded roles and to update their knowledge and skills, has been found a strong facilitator for the development and implementation of nurses' expanded roles, including HIV clinical roles (Ball 1999, Nankumbi, Groves et al. 2011). Conversely, the absence of a supportive organisational culture limits the extent to which nurses can take up expanded roles (Glen and Waddington 1998, Woods 1999), delays change (Flanagan 1998) and negatively impacts on nurses' ability to execute expanded roles (Glen and Waddington 1998). Nurses' frustration and inability to execute expanded roles is attributed to unsupportive organisational cultures (Flanagan 1998, Glen and Waddington 1998, Woods 1999). Organisational culture is mostly expressed in policy support and protocols or formal

procedures, which describe nurses' expanded roles to avoid professional tensions and to remove unwarranted restrictions such as limited prescription authority (Bonnel, Belt et al. 2000, Piore, Landefeld et al. 2001, Tye and Ross 2001, CE.Fletcher, SJ.Baker et al. 2007, Offenbeek, Sorge et al. 2009, Kaasalainen, Martin-Misener et al. 2010, Lindblad, Hallman et al. 2010, Middleton, Gardner et al. 2011, Zwijnenberg and Bours 2012). A literature review of the effect of workload on task shifting is discussed next.

2.5.2 Workload

Studies in SSA have reported work overload as problematic to the development of nurses' expanded HIV clinical roles (Bedelu, Ford et al. 2007, Arem, Nakyanjo et al. 2009, Davies, Homfray et al. 2013, Emdin, Chong et al. 2013, Baine and Kasangaki 2014, Spies, Gray et al. 2016). Two UK studies, Flanagan (1998) and McCreddie (2001) have reported work overload to result from increased patient loads and the accompanying administrative tasks that came with their new roles related to the success of the expanded nurse role initiative. Flanagan (1998) found that the increased work overload created difficulties which limited the successful implementation of nurses' expanded roles. Work overload has also caused stress and burn-out for nurses in expanded clinical roles (McCreddie 2001) and led to the lack of time for nurses in expanded roles to undertake continued professional development (Flanagan 1998). In the UK, Loftus and McDowell (2000) found that high patient loads prevented nurses in expanded roles from forming meaningful therapeutic relationships with their patients, limiting opportunities for them to know their patients better. Therapeutic relationships improve the acceptability of nurses in expanded roles and facilitate the implementation of expanded roles (Loftus and McDowell 2000). The literature review on the importance of role clarity in facilitating task shifting is discussed next.

2.5.3 Role Clarity

In an international systematic review to identify factors that act as barriers and facilitators to the development and implementation of expanded clinical nurse roles, Lloyd (2005) identified role ambiguity as the most critical. Other researchers also have identified role ambiguity as a common and significant barrier to the successful implementation of nurses' expanded roles (Dunn and Nicklin 1995, DiCenso, Paech et al. 2003, Bryant-Lukosius, DiCenso et al. 2004a, Schreiber, MacDonald et al. 2005a,

Schreiber, MacDonald et al. 2005b, Griffiths 2006, Donald, Bryant-Lukosius et al. 2010, Donald, Martin-Misener et al. 2010). Role ambiguity arises when what is entailed in nurses' expanded roles is not clear to the nurse or other stakeholders, or is understood differently (Handy 1993, Lloyd 2005). This ambiguity of nurses' expanded roles due to unclear role definitions is not only a barrier to implementation (Flanagan 1998, Glen and Waddington 1998, Ball 1999, Woods 1999, Bamford and Gibson 2000, Tye and Ross 2001), but also puts less visible services at risk of being scrapped in times of financial difficulties (Flanagan 1998).

In Canada, role ambiguity was found to result directly from variable stakeholder awareness and competing stakeholder expectations, which resulted from undefined roles and responsibilities in nurses' job descriptions (Bryant-Lukosius, DiCenso et al. 2004a). The absence of consensus amongst the different stakeholders about nurses' expanded role expectations, which arises from nurses' roles and scope of work having different meanings to different people, has led to conflict and work overload for nurses (Bryant-Lukosius, DiCenso et al. 2004a). The lack of role clarity has also negatively influenced the acceptance of nurses in expanded roles by other healthcare team colleagues and often led to their unsupportive behaviour towards these nurses (Alcock 1996, Irvine, Sidani et al. 2000, Lloyd 2005, McNamara, Giguère et al. 2009). On the other hand, several studies have found that the healthcare team's understanding of nurses' expanded roles is a facilitator to role implementation (Davies and Eng 1995, Schreiber, Davidson et al. 2003, Jones and Way 2004, Roschkov, Rebeyka et al. 2007).

Studies have suggested that role ambiguity could be minimised by having in place job descriptions which clearly articulate nurses' scope of practice and roles and responsibilities based on defined patient and health care system needs and stakeholder involvement (Dunn and Nicklin 1995, Bryant-Lukosius, DiCenso et al. 2004a). Furthermore, the involvement of nurses in defining their expanded roles together with organisational support minimises role ambiguity (DiCenso, Paech et al. 2003, Lachance 2005). Nursing organisations have been called upon to create vision statements with clear role definitions and boundaries to facilitate a common understanding and implementation of expanded nurse roles (Glen and Waddington 1998) and to minimise

conflicts and stress (Loftus and McDowell 2000). A literature review of the role of managers' support in facilitating task shifting is discussed next.

2.5.4 Managers' Support

Nankumbi, Groves et al. (2011) and Georgeu, Colvin et al. (2012) have highlighted the critical role managers of healthcare facilities play in enabling nurses to execute expanded HIV clinical roles to full scope. However, nurses in expanded clinical roles, particularly those who are new to the role or to the organisation, have reported insufficient management support, which has resulted in numerous difficulties for them in implementing their roles within health care systems (Knaus, Felten et al. 1997, Irvine, Sidani et al. 2000). This lack of management support is frequently reported as a barrier to role implementation expanded nurse roles (Ingram and Crooks. 1991, Davies and Eng 1995, Reay, Golden-Biddle et al. 2003, Hurlock-Chorostecki, van-Soeren et al. 2008, Carter, Martin-Misener et al. 2010).

A major function of managers is to help new nurses in expanded roles to navigate the healthcare facility system and to link nurses in expanded roles to healthcare facility priorities to improve patient care (Bryant-Lukosius and Dicenso 2004). Managers can help nurses navigate the healthcare system by defining and clarifying nurses' expanded roles to all healthcare facility team members, high-profiling of the expanded nurse roles within the healthcare facility and introducing new nurses in expanded roles to the healthcare facility teams (Bryant-Lukosius and Dicenso 2004). Managers are also critical in the provision of resources that enable nurses perform their expanded roles (Nankumbi, Groves et al. 2011, Georgeu, Colvin et al. 2012).

Managers can also offer support to nurses in expanded roles by assigning leadership responsibilities to them, involving them in expanded roles in education activities, developing and advocating for supportive policies and practices, and supporting expanded role implementation (Bryant-Lukosius and Dicenso 2004). Managers of healthcare facilities have also promoted expanded nurse clinical role development through providing emotional support in situations of stress, clerical and data management support, educational opportunities, and clarifying the reporting structures

for these nurses to all the healthcare facility team members (Reay, Golden-Biddle et al. 2003). Keeping regular contact with nurses in expanded roles, facilitating networks and working groups, conducting regular evaluation of the expanded nurses' roles implementation and provision of mentorships to these nurses are the other possible ways managers may support these nurses to perform their work. In addition to providing resources required to implement expanded nurse roles, managers should enact policies that support and legitimise the roles (Hamilton, Vincent et al. 1990, Reay, Golden-Biddle et al. 2003, Carter, Martin-Misener et al. 2010).

Managers' involvement has also been found critical in attending to the varied healthcare team perspectives, assisting with resolving conflicts arising from altered working relationships, and guiding the healthcare team through the process (Reay, Golden-Biddle et al. 2003, Reay, Patterson et al. 2006). Some researchers have recommended that managers should assist the healthcare team members to understand how nurses in expanded roles will fit in the work setting, involve healthcare team members in the process, and allow all team members to voice their concerns about how the expanded nurse roles will impact various established roles to forestall conflicts (Goss-Gilroy-Inc 2001, Soeren and Micevski 2001, Stolee, Hillier et al. 2006). The literature on the role of guidelines and protocols in enabling nurses to execute expanded roles is discussed next.

2.5.5 Clinical Guidelines and Protocols

The use of simplified and standardised protocols including clinical guidelines, recording and reporting systems, and monitoring and evaluation mechanisms has been found to facilitate task shifting (Libamba, Makombe et al. 2005, Harries, Schouten et al. 2006, Lehmann, Van-Damme et al. 2009, Shumbusho, Griensven et al. 2009, Georgeu, Colvin et al. 2012, Lanktree, Corluca et al. 2014). Indeed, Harries, Schouten et al. (2006) and Colvin, Fairall et al. (2010) have argued that without the use of simplified clinical guidelines and strong supervision, the scale-up of ART with acceptable quality standards which has resulted in saving of many lives would have been impossible. In fact, there are examples in SSA, where the national ministries of health have, with great success, implemented scale-up ART plans with the involvement of non-physician clinicians providing ART using standardised protocols (Libamba, Makombe et al. 2005, Harries,

Schouten et al. 2006, Shumbusho, Griensven et al. 2009, Georgeu, Colvin et al. 2012). In industrialised countries, the use of clinical protocols and formal procedures has also been found to facilitate task reallocation from physicians to nurses (Bonnell, Belt et al. 2000, CE.Fletcher, SJ.Baker et al. 2007, Middleton, Gardner et al. 2011, Zwijnenberg and Bours 2012).

A lack of nurse-specific clinical guidelines and protocols makes it difficult for nurses in expanded roles to practice to their full potential (Bonnell, Belt et al. 2000, CE.Fletcher, SJ.Baker et al. 2007, Middleton, Gardner et al. 2011, Zwijnenberg and Bours 2012). For that reason, K.Hermann, WV.Damme et al. (2009) have recognised the use of protocols and standard guidelines as critical for quality assurance in most health professions, and nurses in expanded HIV clinical roles are certainly no exception. The literature on the importance of having an efficient referral system to enable nurses to execute expanded roles effectively is discussed next.

2.5.6 Referral System

The literature underscores the importance of having in place an efficient referral system if nurse-led ART clinics are to be effective (Baker, Benton et al. 2007, WHO/PEPFAR/UNAIDS 2007, Zachariah, Ford et al. 2009, WHO 2012, Dambisya and Matinhure 2012). Numerous authors have noted that nurses in expanded roles will occasionally face patients with needs beyond their levels of competence or authority to handle, thus requiring consultation with or referral to appropriate service providers (Provan, Sebastian et al. 1994, Kitahata, Tegger et al. 2002, Stuart, Harkins et al. 2005, Dambisya and Matinhure 2012). An efficient and effective referral system ensures that quality services are provided by enabling healthcare providers in extended roles to triage, diagnose, determine the health care needs, and refer patients promptly for appropriate care, if necessary (Provan, Sebastian et al. 1994, Kitahata, Tegger et al. 2002, Baker, Benton et al. 2007, WHO/PEPFAR/UNAIDS 2007, Zachariah, Ford et al. 2009, WHO 2012, Dambisya and Matinhure 2012). Weak linkages between the healthcare workers of different levels of qualification, and between facilities with different levels of expertise have been found to yield less satisfactory results (Kloos 1990, Stuart, Harkins et al. 2005, Wools-Kaloustian, Sidle et al. 2009).

The WHO/PEPFAR/UNAIDS (2007) have advised that countries considering implementing task shifting should establish referral systems that not only facilitate upward referrals from healthcare workers with less qualifications to those with higher qualifications, or from less-equipped healthcare facilities to more equipped ones, but also facilitate referrals in the reverse direction to ensure the effective provision of chronic HIV care. Indeed, Holdsworth, Garner et al. (1993) have highlighted the importance of back-referrals for stabilised patients, reasoning that services that are closer to patients' homes reduce time and money patients spend travelling to far service points. They have argued that back-referrals improve the efficiency of the management of chronic conditions as they guarantee long-term follow-up and ensure the proper provision of health and social services by community healthcare workers and by community members (Holdsworth, Garner et al. 1993).

However, many countries in SSA experiencing severe shortages of HRH together with a high HIV burden also have weak referral systems requiring significant investment of resources to strengthen (WHO 2007c, Orner, Cooper et al. 2011, Ferrinho, Sidat et al. 2012, Georgeu, Colvin et al. 2012, Davies, Homfray et al. 2013, O'Malley, Asrat et al. 2014). As a result, WHO/PEPFAR/UNAIDS (2007) and Walford and Grant (1998) have advised that referral systems need to be properly resourced with good communication and transport to facilitate the referral process, and provided with adequate numbers of healthcare workers at both ends of the system since lower-skilled healthcare workers in expanded roles will rely on such a system to ensure patient safety. The literature on the importance of infrastructure and resources to the success of task shifting is discussed next.

2.5.7 Infrastructure and Resources

Studies in SSA have identified several infrastructure deficits worsened by increasing numbers of patients on ART to impede the successful development and implementation of nurse-led ART delivery (Orner, Cooper et al. 2011, Ferrinho, Sidat et al. 2012, Georgeu, Colvin et al. 2012, Davies, Homfray et al. 2013, O'Malley, Asrat et al. 2014). These studies found infrastructural challenges have included lack of transport to transfer

complicated patients to higher referral levels and inadequate spaces at the healthcare facilities to enable nurses to provide private and confidential services to their patients. Other infrastructure challenges have included the lack of functioning toilets at some healthcare facilities, which de-motivates healthcare workers and patients, and the lack of telephones and internet services to facilitate consultation between nurses and doctors when faced with difficult cases (Davies, Homfray et al. 2013, O'Malley, Asrat et al. 2014).

Infrastructure challenges were found to be more pronounced in remote under-served areas where nurse-led ART clinics are mostly located (Davies, Homfray et al. 2013, O'Malley, Asrat et al. 2014). For example, O'Malley, Asrat et al. (2014) in Namibia, found numerous barriers related to limited infrastructure at the healthcare facilities where the nurse-led ART clinics were located. They found a lack of space to store patient files and the absence of filing systems for patient files at these healthcare facilities as major barriers to the proper functioning of these clinics (O'Malley, Asrat et al. 2014). They also found the absence of pharmacy space for secure storage and management of drugs and most healthcare facilities did not have enough consultation rooms for nurses and doctors to work concurrently, reducing the value of having a nurse trained to examine and assess patients (O'Malley, Asrat et al. 2014).

As well, earlier studies in industrialised countries found shortages of resources such as adequate office space, clerical support, communication technology, and educational opportunities major barriers to the successful development and implementation of nurses' expanded roles (McFadden and Miller 1994, Sanchez, Lee et al. 1996, Wong 1997, Flanagan 1998, Glen and Waddington 1998, Woods 1999, Bamford and Gibson 2000, Tye and Ross 2001). The lack of appropriate accommodation (Flanagan 1998, Glen and Waddington 1998), nursing staff (Wong 1997, Glen and Waddington 1998, Tye and Ross 2001), adequate funding (Woods 1998, Tye and Ross 2001), administrative support such as computer and secretarial support (Flanagan 1998), and resources for research and education (Bamford and Gibson 2000) were also found major barriers to the implementation of expanded nurse roles. Bamford and Gibson (2000) found that a lack of time and funding restricted nurses in expanded roles from accessing educational opportunities. Flanagan (1998) mentioned that the lack of resources in most

cases resulted from poor planning for the role, with nurses appointed to expanded role positions without adequate preparation of resources to support them to implement them. Indeed, Lloyd (2005) noted that the lack of resources occurred when nurses in expanded roles were still new in the post and that this was resolved with time. Next, the literature on the effect of healthcare workers' attitudes towards task shifting on the effectiveness of expanded nurse roles is discussed.

2.5.8 Attitudes towards Task Shifting

The literature is full of examples where doctors, nurses, and other healthcare professionals have resisted the transfer of tasks originally in their domain to other healthcare workers who, in most cases, have less training (Dovlo 2004, Mullan and Frehywot 2007, Daviaud and Chopra 2008, MSF 2008, ECSA-HC 2010, Spies, Gray et al. 2015). For example, a study on task shifting in Uganda conducted by ECSA-HC (2010) noted that doctors were reluctant to have clinical officers perform any type of surgery because they feared to lose their status in the community. The same study also reported that nurses resisted others healthcare workers, such as nursing assistants, from taking on tasks in the nursing domain because they feared being undermined (ECSA-HC 2010).

These attitudes are influenced by numerous factors. For example, nurses have held mixed feelings about taking on doctors' roles without their pay being increased (Dovlo 2004, Mullan and Frehywot 2007). Also, professional groups have objected to task shifting because they feared competition from healthcare workers to whom tasks have been shifted, and subsequent loss of income especially where remuneration includes a fee-for-services component (James, Hanson et al. 2006). Professional councils and associations have, in some instances, resisted delegation of tasks to lower cadres (Daviaud and Chopra 2008, MSF 2008), and resisted the additional supervisory responsibilities that come with shifting tasks from higher to lower cadres (Zachariah, Ford et al. 2009). Task shifting from doctors, nurses, and pharmacists to assistants has also met with some resistance from professional groups, especially regarding concerns about quality and safety of care for patients (WHO 2005b). In Uganda, Spies, Gray et al. (2015) found that nurses in expanded HIV clinical roles were proud of the work they were doing but were challenged by the lack of consistent and appropriate support. The

researchers recommended a need for additional policies, regulations, and consistent preparation for nurses who work in environments with task shifting (Spies, Gray et al. 2015). The literature has also revealed that the effectiveness of expanded nurse roles requires teamwork, which is discussed next.

2.5.9 Team Work

The delivery of health care occurs in teams and nurses in expanded roles can only perform their roles in collaboration with others (Georgeu, Colvin et al. 2012). Successful implementation of task shifting involves working in teams with varied healthcare professionals, thus requiring good inter-professional relationships (Callaghan, Ford et al. 2010). However, there have been some reported challenges with teamwork, for example, Tantchou-Yakam and Gruénais (2009) in a study on the task shifting in the ART programme in Cameroon found pervasive tensions between nurses and community health workers due to hierarchies within the clinic and ambiguities surrounding their roles. Tantchou-Yakam and Gruénais (2009) advised that task-shifting policies must anticipate these tensions and forestall them by defining processes, roles and responsibilities for both existing and newly-created healthcare providers.

Internationally, researchers have highlighted the importance of support of others, including nurses, in facilitating the implementation of expanded nurse roles, noting that where poor inter- and intra-professional relationships exist, conflict emerges, which impedes the implementation of expanded nurse roles implementation (Glen and Waddington 1998, Waters 1998, Bamford and Gibson 2000, Gibson and Bamford 2001). Relationships among healthcare workers create work conditions that can facilitate or obstruct advanced practice nurse role development (Hamric 2000). The inclusion of managers, doctors and other healthcare providers in activities such as mentoring nurses in expanded roles has been found important in gaining their support for nurses in expanded clinical roles (Goss-Gilroy-Inc 2001, van-Soeren and Micevski 2001, Cummings, Fraser et al. 2003, DiCenso, Paech et al. 2003, Reay, Golden-Biddle et al. 2003, Reay, Patterson et al. 2006, Stolee, Hillier et al. 2006). Among the supports to enable nurses in expanded roles do their work, the literature identified doctors' support as especially important and is discussed next.

2.5.10 Doctors' Support

Because doctors and nurses make up the largest groups of individuals within the healthcare environment (Siedlecki and Hixson 2015), the relationship between them is a major determinant of the quality of care they provide to their patients (Krogstad, Hofoss et al. 2004, Siedlecki and Hixson 2015). Good working relationships between doctors and nurses in expanded clinical roles is critical in enhancing the implementation of nurses' expanded clinical roles (Way, Jones et al. 2000, Siedlecki and Hixson 2015). If their working relationship is healthy, it facilitates the implementation and integration of nurses' expanded clinical roles; but if not good, it is a significant barrier (DiCenso, Paech et al. 2003). Doctors have been found particularly important in the early stages of expanded nurse role development when nurses are still novices (Flanagan 1998). Healthy working relationships with nurses have been reported in situations where doctors initiated the introduction of expanded nurse roles out of need (DiCenso, Paech et al. 2003).

However, doctors have presented mixed views on expanded nurse roles, with some showing opposition and others showing support to nurses taking up expanded roles (Arslanian-Engoren 1995, Flanagan 1998, Waters 1998, Gibson and Bamford 2001, McCreaddie 2001). Doctors' opposition to nurses taking up expanded roles has resulted in conflict with nurses and stress among these nurses and is thus a barrier to the implementation of the new roles (Arslanian-Engoren 1995, Flanagan 1998, Waters 1998, Gibson and Bamford 2001, McCreaddie 2001). Indeed, S.Greenfield, Stilwell et al. (1987) found that practice nurses felt that doctors' negative attitudes were the most limiting factor to the expansion of the nurses' roles.

In SSA, another major source of doctors' non-supportive behaviour towards nurses' expanded HIV clinical roles is their concern about nurses' education, which they have said is not well regulated, is not standardised, and is not adequate to enable them to safely perform expanded roles (Iwu and Holzemer 2014, AMREF 2015, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016). Indeed, Crowley and Mayers (2015) in a systematic review of the trends in task shifting in HIV treatment in Africa, also found that some doctors were unhappy with nurses taking on expanded HIV clinical tasks

mainly due to professional protectionism. In the UK, doctors resisted nurses in expanded roles because they felt that only doctors had the necessary training, skills, and intellect to assess patients, diagnose disease, and prescribe treatment (Wilson, Pearson et al. 2002, Gardner, Gardner et al. 2004, Elsom, Happell et al. 2009).

The conflict has also arisen when doctors have viewed expanded nurse roles as a threat to their traditional roles of making patient-care decisions (Arslanian-Engoren 1995, Flanagan 1998, Waters 1998, Gibson and Bamford 2001, McCreaddie 2001). Furthermore, conflict has arisen when nurses in expanded roles compete with doctors for opportunities to perform medical activities (DiCenso, Paech et al. 2003, Pong and Russell 2003, Hall, Cantrill et al. 2006, Cooper, Guillaume et al. 2008, Donald, Bryant-Lukosius et al. 2010), resulting in concerns about doctors losing some of their skills through disuse (Tye and Ross 2001, Wilson, Pearson et al. 2002, Reay, Golden-Biddle et al. 2003, Long, McCann et al. 2004).

Fee-for-service reimbursement funding mechanisms that create financial competition resulting in loss of doctors' income when nurses in expanded roles compete with doctors for the same patients, are a major source of doctors' unsupportive behaviour towards the implementation of expanded nurse roles (DiCenso, Paech et al. 2003, Jones and Way 2004, Schreiber, MacDonald et al. 2005a). Other principal reasons presented for doctors' resistance to nurses taking up expanded roles have been related to liability concerns (Way, Jones et al. 2001, Martin-Misener, McNab et al. 2004, Bailey, Jones et al. 2006), overlapping scope of practice (DiCenso, Paech et al. 2003), lack of clarity of expanded roles (DiCenso, Paech et al. 2003, Jones and Way 2004), and concern about nurses in expanded roles independent practice. A UK study found that doctors without the experience of working with nurses in expanded roles feared that their workload and stress would increase because these nurses would manage all the easy patients leaving the doctors with more challenging patients (Wilson, Pearson et al. 2002).

Resistance to nurses taking up expanded roles has also been reported at professional association level - beyond the individual doctor level (Hain and Fleck 2014). At the professional level, medical associations have opposed initiatives that expand nurses'

scope of practice such as prescribing privileges (DiCenso, Bryant-Lukosius et al. 2010, Hain and Fleck 2014), to protect their members' interests (Baerlocher and Detsky 2009). For example, in the USA, some physician professional organisations, including the American Medical Association, believe that physicians have longer and more rigorous training than nurse practitioners whom they say are incapable of providing quality care at the same level as physicians (AMA 2010, Fairman, Rowe et al. 2011). The resistance to nurse role expansion from the medical associations has also come from nursing associations and has led to calls for shifting from a competitive nurse in expanded role implementation model to a collaborative one (Kilpatrick, Harbman et al. 2010). Where the extension of nurses' scope of practice has been achieved through delegation of tasks and use of protocols, medical directives and drug lists, there has been less resistance from doctors and medical associations (Hurlock-Chorostecki, van Soeren et al. 2008, Kilpatrick, Harbman et al. 2010). The literature on personal nurse factors that influence the development and implementation of task shifting is discussed next.

2.6 Personal Nurse Factors

Studies have identified altruism, work experience, age, and gender, and education background as key individual nurse factors that influence the success of the development and implementation of expanded nurse roles (Williams and Calnan 1991, Collins, Jones et al. 2000, Tye and Ross 2000, Rafferty, Ball et al. 2001, Kinley, Czoski-Murray et al. 2002, Marsden, Dolan et al. 2003, Easton, Griffin et al. 2004, Norris and Melby 2006, Zangaro and Soeken 2007, McKenna, Richey et al. 2008). The literature on how each of these factors influences task shifting is discussed briefly in this section, starting with altruism.

2.6.1 Altruism

The religious duty to do good and the belief by nurses that offering expanded HIV clinical roles makes a difference to patient care is a strong motivator for them to execute these tasks (Iwu and Holzemer 2014). The belief amongst nurses in expanded roles that their services make a positive contribution to the quality of patient care contributes to their job satisfaction and retention (Collins, Jones et al. 2000, Tye and Ross 2000, Rafferty, Ball et al. 2001, Kinley, Czoski-Murray et al. 2002, Marsden, Dolan et al. 2003, Easton, Griffin et al. 2004, Norris and Melby 2006, Zangaro and Soeken 2007,

McKenna, Richey et al. 2008). Iwu and Holzemer (2014) found that altruism was among the strongest facilitators for nurses to provide expanded HIV clinical services. The literature on the importance of work experience on nurses' ability to execute expanded roles is discussed next.

2.6.2 Work Experience

Nurses' experience in the roles and with the organisation act as facilitators to nurses taking expanded roles when present, and as barriers when absent (Glen and Waddington 1998, Waters 1998, Ball 1999, Bamford and Gibson 2000, Marsden 2000). Nurses with prior experience in the roles know what to do to implement the roles, and those with prior experience with the organisation know how to navigate the system (Waters 1998, Ball 1999, Bamford and Gibson 2000, Marsden 2000). Nurses' experience influences their acceptability by patients and other healthcare professionals, with those nurses having relevant experience perceived as more competent and therefore more acceptable (Ball 1999). The literature on the importance of age on the effectiveness of nurses' expanded roles is discussed next.

2.6.3 Age

The age of the healthcare provider may present a barrier, such as in Ghana where young women posted in very traditional communities reportedly had some difficulty obtaining respect from elders (Delbanco and Gerteis 2010). Philips, Zachariah et al. (2008) and Buchan and O'May (2000) have noted that the acceptability of certain types of staff to communities might be shaped by societal preferences including age. The literature on the importance of gender on the effectiveness of nurses' expanded roles is discussed next.

2.6.4 Gender

Philips, Zachariah et al. (2008) and Buchan and O'May (2000) also noted that in addition to individual characteristics of healthcare providers such as age, their acceptability to communities and patients is as well influenced by the providers' gender and professional experience. For example, women in some communities prefer receiving care from other women other than from men (Nyanzi, Manneh et al. 2007, Philips, Zachariah et al.

2008). Most nurses are females, and qualities attributed to ‘femaleness’ (caring, gentleness, nurturing and warmth) are attributes which patients value in a healthcare provider (Gray 1982). Female patients, especially those seeking gynaecological and obstetric advice, have reported greater satisfaction with female than male physicians (Comstock, Hooper et al. 1982, Lieberman, Sledge et al. 1989). The importance of consulting a person of the same gender is apparent in both stated preference and actual behaviour, especially for consultations of a more intimate nature (Preston-Whyte, Fraser et al. 1983, Nichols 1987, Graffy 1990, Brooks and Phillips 1996). This preference is attributed to the ease with which a woman can be spoken to, partly because it is less embarrassing and partly because a woman is in a better position to empathise with a female patient (Luker, Austin et al. 1998).

2.6.5 Education Background

Other individual nurse factors that have been found in the literature to act as either facilitators or barriers for nurses to take expanded roles are related to educational and professional issues of nurses, which determine nurses’ knowledge and capabilities (Bocoum, Kouanda et al. 2013). The literature on how the nurse-level outcomes influence on the development and implementation of task shifting is discussed next.

2.7 Nurse-Level Outcomes

Nurses’ competencies, self-confidence, and motivation were identified in the literature as key nurse-level outcome measures that act as prerequisites for nurses to execute expanded clinical roles (Latter and Courtenay 2004, Hall, Cantrill et al. 2006, Green, Westwood et al. 2009, Georgeu, Colvin et al. 2012, Blanchflower, Greene et al. 2013, Iwu and Holzemer 2014). The literature on the critical role played by each of the three nurse-level outcomes to influence the effectiveness of nurse-based task shifting is discussed next, starting with nurses’ competence.

2.7.1 Nurses’ Competence

Healthcare workers’ competence has been defined as their ability to perform according to pre-defined standards (Lane and Ross 1988). Healthcare workers’ competence also refers to their qualifications and experiences, and how they apply their technical knowledge

and skills to provide patients with the optimal promotional, preventive and curative care (Lane and Ross 1988, Brown and L. M Franco 1992). Healthcare workers' clinical skills related to history taking, clinical investigation, preventive care, diagnosis, treatment and health counselling are important dimensions of their competence and determine their ability to diagnose disease, give appropriate treatment for a disease condition and communicate with their patients (Kelley and Hurst 2006).

Nurses' technical and interpersonal skills, are the two components of competence found in published literature to be critical to the successful implementation of expanded roles (Georgeu, Colvin et al. 2012, Iwu and Holzemer 2014). Nurses' effective interpersonal skills are seen as strength in nurse consultations and have contributed to the quality of care and, specifically, to patient satisfaction, which has stimulated task rearrangement (Flanagan 1998, Glen and Waddington 1998, Ball 1999, Bamford and Gibson 1999a, Tye and Ross 2001).

In the literature on patient satisfaction with healthcare provider qualities, patients have mentioned features related to what healthcare professionals often refer to as the technical quality of care (Blumenthal and Epstein 1996, Epstein, Laine et al. 1996). Patients have expressed a desire to be seen by technically knowledgeable, competent, and experienced providers who are well educated; provide effective treatments, accurate diagnoses, and diligent and efficient services and treatment; and present themselves in a professional manner (Blumenthal and Epstein 1996, Epstein, Laine et al. 1996). Patients have also defined quality as having good health outcomes and improved quality of life (Blumenthal and Epstein 1996, Epstein, Laine et al. 1996).

Studies have shown that patients want and accept healthcare workers who exhibit attributes of quality of care mostly referred to as 'patient-centred care' (IOM 2001a, Shaller 2007, IOM 2010). Patients put emphasis on whether their physical and emotional needs are being met, whether their care is individualised, whether they are involved in their care and decision-making, and whether providers have personalised knowledge of their disease conditions (IOM 2001a, Shaller 2007, IOM 2010). Patients have mentioned providers' respect and knowledge of the patients' beliefs, the ability to establish

provider-client rapport, and providers' appreciation and ability to advocate for patients' needs, including patients' privacy and confidentiality, as important (Ndulo, Fixelid et al. 1995, Blumenthal 1996, Epstein, Laine et al. 1996). Other essential provider qualities patients use to determine quality care include provision of equal care, involvement of the patients' family and friends in provision of care (Edgman-Levitan and Cleary 1996, Concato and Feinstein 1997, Irurita 1999, Singh, Haqq et al. 1999, Radwin 2000, Stichler and Weiss 2000, Anderson, Barbara et al. 2001, Attree 2001, Larrabee and Bolden 2001, Margolis, Al-Marzouq et al. 2003, Ngo-Metzger, Massagli et al. 2003, Infante, Proudfoot et al. 2004, Jun, Peterson et al. 1998), provider's quality of communication and information given to them, social and emotional characteristics of interaction between the patient and healthcare provider, and the patient's perception of the provider's technical quality (Ndulo, Fixelid et al. 1995, Blumenthal 1996, Epstein, Laine et al. 1996).

Nurses, in particular, as a professional group, have been said to have 'close and continuing' contact with the patient, which places them in a unique position to make an accurate assessment of the patient's needs due to the enhanced nurse-patient relationship (Howie, Porter et al. 1991, Wilson 1991, Williams and Calnan 1991a, Williams and Calnan 1991b). Patients do not appreciate short consultations, which they associate more with doctors than with nurses (Howie, Porter et al. 1991, Wilson 1991, Williams and Calnan 1991a, Williams and Calnan 1991b). These researchers have reported that patients find that doctors' care unsatisfactory because they work hurriedly and fail to listen, and hence do not provide adequate information to patients (Howie, Porter et al. 1991, Wilson 1991, Williams and Calnan 1991a, Williams and Calnan 1991b). Longer consultations result in greater patient satisfaction with services as the healthcare provider is perceived as having more time to discuss problems and provide information, which helps to alleviate any anxiety experienced by patients (Morrell, Evans et al. 1986, Howie, Porter et al. 1991, Williams and Calnan 1991a, Williams and Calnan 1991b, Risdale, Carruthers et al. 1989).

Healthcare provider attributes such as being understanding, friendly and willing to listen, are appreciated by patients, especially women (Brooks and Phillips 1996). Nurses are perceived as easier to speak to and having more time to listen to patients (Drury,

Greenfield et al. 1988, Salisbury and Tettersell 1988, Stilwell 1988, Stilwell 1991, Brooks and Phillips 1996, Paxton 1996). Nurses as a professional group have a particular ability to form warm and friendly relationships with their patients, which is highly appreciated (Stilwell 1991). The ease with which patients can speak to nurses, unlike with doctors, is partly attributed to the nurse's 'equal social footing' with the patient (Fawcett-Henesy 1995). Indeed, Brooks and Phillips (1996) consider this 'lack of social distance' between nurses and patients as highly valued by many women, and Drury, Greenfield et al. (1988) cite the relative status of doctors and nurses in society as the reason why some patients find it easier to relate to the nurse than to the doctor.

2.7.2 Nurses' Self-Confidence

Studies have found that nurses who have high confidence in their capabilities are more likely to take up roles outside their traditional scope of practice (Georgeu, Colvin et al. 2012, Blanchflower, Greene et al. 2013), while nurses lacking confidence are less likely to take up new expanded roles (Tye and Ross 2001). Nurses' confidence in their capabilities has been found a prerequisite for nurses to take up expanded clinical roles since it encourages them to make critical patient management decisions autonomously (Tye and Ross 2001, CE.Fletcher, SJ.Baker et al. 2007;, Offredy, Kendall et al. 2008, Zwijnenberg and Bours 2012). Lack thereof has been found to result in nurses in expanded roles referring patients to doctors, thus hampering task shifting (Tye and Ross 2001, CE.Fletcher, SJ.Baker et al. 2007, Offredy, Kendall et al. 2008, Zwijnenberg and Bours 2012, Iwu and Holzemer 2014). In the UK, Luker, Austin et al. (1998) in an evaluation of nurse prescribing, found lack of confidence a major barrier to prescribing by inexperienced nurse prescribers. In South Africa, Georgeu, Colvin et al. (2012) in their study of implementing nurse-initiated and managed ART also found self-confidence a key nurse pre-condition for nurses to execute expanded HIV clinical tasks. Georgeu, Colvin et al. (2012) identified numerous factors influencing nurses' confidence, which include the use of HIV guidelines with clear referral protocols that are nurse-specific, the ease with which guideline-based care is used, the way individual clinics determine the implementation pace of the intervention, and effectiveness of training and clinical support and supervision from doctors. They however found inadequate clinical support a significant barrier to nurses developing the clinical confidence (Georgeu, Colvin et al. 2012).

Linked to self-confidence is autonomy, which refers to the ability to act according to one's knowledge and judgment to provide nursing care within the full scope of practice as defined by existing professional, regulatory, and organisational rules (Weston 2008, Weston 2010). Highly performing nurses report that the culture of their work environment encourages autonomous practice by their managers expecting and supporting them to utilise their nursing expertise to deliver the best in patient care (Kramer and Schmalenberg 2003a). Indeed, McClure, Poulin et al. (1983) have found that healthy work environments not only promote professional practice autonomy and control over nursing practice but also encourage the development of nurses' self-confidence. Self-confidence, autonomy and control over nursing practice have indeed been demonstrated to act as intervening variables that explain the relationship between healthy work environment and positive patient outcomes (Aiken, Smith et al. 1994). The literature review on the importance of motivation on nurse-based task shifting is discussed next.

2.7.3 Nurses' Motivation

The successful implementation of new healthcare initiatives such as task shifting to a large extent depends on qualified and motivated healthcare workers (Bennett and Franco 1999, Martineau and Buchan 2000, Donabedian 2003, Uzochukwu and Onwujekwe 2005, Kabene, Orchard et al. 2006, Ssenogooba, Rahman et al. 2007, Philips, Zachariah et al. 2008). Motivation, which has been defined as the individual's degree of willingness to exert and maintain effort towards attaining organisational goals (Franco, Bennett et al. 2002, Ajzen 2005, Rowe, Savigny et al. 2005), is a critical factor affecting healthcare worker performance, including that of nurses in expanded HIV clinical roles (Jacobi 2010). Because the quality of health services, including efficacy, efficiency, accessibility, and viability, is highly dependent on the motivation of healthcare workers (Franco, Bennett et al. 2002), it is critical that policymakers seriously consider healthcare workers' motivation as a central issue in the formulation of the health policy (Mbilinyi, Daniel et al. 2011).

For new health initiatives such as the nurse-led ART clinics to meet their desired goals, planners need to explore factors that motivate healthcare workers to implement these initiatives (Martinez and Martineau 1998, Rowe, Savigny et al. 2005, Uzochukwu and Onwujekwe 2005). Such factors that motivate healthcare workers to implement new initiatives have included working conditions, monitoring systems, clarity of responsibilities, organisational goals, organisational work processes, task complexity, availability of resources to carry out the job, availability of standards, training, supervision, and communication mechanisms (Martinez and Martineau 1998, Rowe, Savigny et al. 2005, Uzochukwu and Onwujekwe 2005). Nurses' job dissatisfaction and low motivation has been related to the lack of a productive healthy work environment nursing shortage, poor quality of nurses' work lives, low productivity, and poor-quality and unsafe patient care (Martinez and Martineau 1998, Rowe, Savigny et al. 2005, Uzochukwu and Onwujekwe 2005).

Bocoum, Kouanda et al. (2013) in Burkina Faso, found job satisfaction among nurses, resulting from their feeling of an increased sense of responsibility, competence, self-esteem, and utility from their training and expansion of tasks and roles, a positive outcome of task shifting. The nurses also reportedly gained confidence when they felt able to learn and acquire new skills and felt a stronger sense of responsibility to deliver expanded services in their new role (Bocoum, Kouanda et al. 2013).

2.8 Chapter Summary

The findings of studies included in this literature review indicate that implementing the expanded clinical roles for nurses is a complex process that is influenced by numerous factors located at the patient and community, policy and funding, wider health system, healthcare facility, and personal nurse environments. These factors act as either facilitators or barriers to the development and implementation of effective nurse-led ART clinics. However, the literature also revealed variation among these factors, as one factor could be a facilitator in one healthcare facility but a barrier in another. Furthermore, facilitators could become barriers if not addressed appropriately or barriers can become facilitators if addressed appropriately. However, this literature review did not identify sufficient evidence to enable one to claim with confidence that these factors specifically influence the development and implementation of effective nurse-led ART

clinics in Uganda and other resource-limited settings, since most studies have investigated task shifting in general, and most of them were conducted in industrialised countries with completely different contexts. Furthermore, the paucity of studies, which interviewed key stakeholders, including PLHIV and nurses in expanded roles, has implications for the reporting of barriers and facilitators. This review has also identified a glaring gap in the literature on patients' perception of quality of care provided by nurses in expanded HIV clinical roles and the acceptability of nurses as providers of ART in SSA. This particular study, therefore, investigated which of these factors, if any, influence the development and implementation of effective nurse-led ART clinics in Uganda. It also investigated patients' perception of quality of care provided by nurses in expanded HIV clinical roles and the acceptability of nurses as providers of ART in Uganda. The literature review on quality of HIV clinical services provided by nurses and the methods used to measure healthcare workers' competencies is discussed in the next chapter.

3 Literature Review on Quality of HIV Clinical Services Provided by Nurses and the Methods used to Measure Healthcare Workers' Competencies

3.1 Introduction

This chapter presents the discussion of the literature on the quality of HIV clinical services provided by nurses and the methods used to measure healthcare providers' competencies. The literature on the quality of HIV clinical services provided by nurses is discussed next.

3.2 Quality of HIV Clinical Services Provided by Nurses

Medical healthcare professionals, policymakers, and patient groups have alluded to the fact that ART is complex treatment and thus quality of care given to patients by non-doctors needs to be investigated (Hopkins, Solomon et al. 1996, Philips, Zachariah et al. 2008, Baine and Kasangaki 2014). These concerns have been taken seriously, with numerous studies in SSA investigating the quality of HIV care provided by nurses (Bedelu, Ford et al. 2007, Zachariah, Teck et al. 2007, Fairall, Bachmann et al. 2012). There is now overwhelming evidence that the use of nurses in the delivery of ART significantly improves patient outcomes (Bedelu, Ford et al. 2007, Zachariah, Teck et al. 2007, Fairall, Bachmann et al. 2012). Nurses are effective in providing ART with patient outcomes such as virologic suppression, adherence rates, and retention in care similar to those of doctors (Bedelu, Ford et al. 2007, Zachariah, Teck et al. 2007, Fairall, Bachmann et al. 2012). The quality of HIV care provided by adequately trained and supported nurses is comparable to the quality of care provided by doctors (Kredo, Adeniyi et al. 2014).

As early as 2007, results in a study by Marston, Macharia et al. (2007) conducted in an urban slum in Kenya showed good patient outcomes, leading the authors to conclude that the response to such treatment in this severely resource-scarce setting was similar to that seen in the industrialised countries. Another study that compared the quality of HIV care provided by non-physician clinicians and physicians in Mozambique, Sherra, Miceka et al. (2010) found that patients whose initial provider was a non-physician clinician were more likely to have their CD4 cell count done after initiating ART than those whose

initial provider was a physician. Most such patients had higher adherence rates to their medication in the first six months after initiating ART, although they had more frequent clinical visits in the first year post-ART initiation when compared to those patients whose initial provider was a physician (Sherra, Miceka et al. 2010). Besides, the authors found that patients seen by non-physician clinicians were less likely to be lost to follow-up than those seen by physicians (Sherra, Miceka et al. 2010).

A study in South Africa by Fairall, Bachmann et al. (2012), and perhaps among the few randomised control studies in SSA known to date, set out to assess the effects of nurse task shifting on mortality, viral suppression, and quality indicators for PLHIV. This study aimed at decentralising HIV care through management support and outreach education training to nurses to enable them initiate ART for new patients and re-prescribe ART for old stable patients (Fairall, Bachmann et al. 2012). The authors concluded that nurses can safely carry out ART initiation and re-prescription and can improve patient health outcomes and quality of care, but might not reduce time to ART initiation and mortality of patients (Fairall, Bachmann et al. 2012). Specifically, the results showed that the time to death did not differ between the patients in the nurse-led group when compared to patients in the doctor-led group. However, although mortality was slightly lower in patients in the nurse-led group when compared to patients in the doctor-led group, it did not differ between the two groups for patients with a baseline CD4 level of 200 cells per μL or less. The results also showed no difference in patients' viral load suppression rates at 12 months after ART initiation between the two groups (Fairall, Bachmann et al. 2012). Furthermore, Suzan-Monti, Blanche et al. (2015) in their study on the benefits of nurse-based task-shifting of HIV care conducted in Cameroon, found that PLHIV who were seen by nurses did better than those seen by doctors in all the WHO Quality of Life elements.

However, as also observed by Chopra, Munro et al. (2008), it is critical to note that the positive outcomes in patients managed by nurses have been attributed to the health system having in place strong supportive supervision mechanisms and continuous education in HIV treatment. For example, in all the studies, nurses were provided with training in HIV care, simplified and standardised guidelines and job aids, and a systematic on-site clinical mentorship, which improved their competencies and boosted

their confidence (Bedelu, Ford et al. 2007, Zachariah, Teck et al. 2007, Fairall, Bachmann et al. 2012). The literature is deficient in nurses' competencies to deliver ART in their natural settings of work (Crowley and Mayers 2015), necessitating this particular study to assess nurses' and doctors' competencies in HIV care including ART. Next, I present a discussion on literature methods used to measure healthcare professionals' competencies.

3.3 Literature on the Methods used to Measure Healthcare Workers' Competencies

Measurement of competence is critical in determining whether healthcare workers have the necessary knowledge, skills, and attitude to perform their assigned duties and responsibilities. Patients' outcome measures such as cure rates, complications, and death rates are often used to measure healthcare workers' competence (Mant 2001, Donabedian 2005). However, patient outcome measures are usually confounded with co-morbidities and socio-economic determinants of health, most of which are beyond the control of the healthcare worker (Peabody, Luck et al. 2000). As a result, where there is a scientific link between the process of care and better patient health outcome, the process of care measures are used rather than patient outcome measures (Brook and Lohr 1985, Peabody, Rahman et al. 1999). For example, processes of care can be measured more frequently than patient outcomes and do not require a long time interval to manifest (Donabedian 1980). Additionally, the process of care measure is less expensive to monitor when compared to patient outcome measures (Lawthers, Palmer et al. 1993, Tamblyn, Abrahamowicz et al. 1998). There are several methods used to measure processes of care, which include but are not limited to review of medical records, direct observation, use of standardised patients (SPs), and use of clinical vignettes. The literature on each of these methods is analysed below, starting with the review of medical records.

Review of medical records has long been used to measure the technical quality of care provided to patients by healthcare workers (Luck, Peabody et al. 2000). Quality evaluations such as clinical audits, physician report cards, and profiles are based on reviews of medical records. Medical record reviews measure both the competence of healthcare workers and what they actually do (Rubin, Rogers et al. 1992, Gilbert,

Lowenstein et al. 1996, McDonald, Overhage et al. 1997). Medical record reviews are mostly used in inpatient evaluations because inpatient departments often have good record-keeping systems (Wu and Ashton 1997). Medical record reviews are advantageous because: they are ubiquitous; they can be obtained after each patient encounter; they give a temporal relation of clinical events (Wu and Ashton 1997); data from them can be obtained retroactively; they are done at a relatively low cost compared to other methods; healthcare providers are not aware of or influenced by the data collection, helping to minimise bias.

Although medical record reviews have several advantages, they have numerous limitations too. Because medical records are often generated for other reasons, such as for legal protection or for obtaining payments, rather than recording the actual process of care events of the clinical visit, they may lack crucial clinical details necessary for measuring the process of patient care (Katz, Chang et al. 1996, Luck, Peabody et al. 2000, Bogardus, Towle et al. 2001). Using SPs, Norman, Neufeld et al. (1985) analysed the completeness of patient records and found that many omitted critical actions. Overall, one-third to one-half of the procedures performed were not recorded. For instance, counselling was rarely recorded (Norman, Neufeld et al. 1985). Furthermore, record audits proved unlikely to detect missing diagnoses or misdiagnoses (Norman, Neufeld et al. 1985). Furthermore, missing and poor quality records are prevalent in developing countries, especially in primary care facilities (Peabody, Rahman et al. 1994). Another problem with medical records is that competence cannot be reliably inferred from the performance of a healthcare worker (Peabody, Rahman et al. 1994). A prospective study showed that review of medical records identified only seventy percent of items performed during the clinical encounter and the authors concluded that medical record reviews underestimated the quality of care for common medical illnesses when compared with SP reports (Luck, Peabody et al. 2000). Another limitation with medical record reviews is that they are neither sensitive nor specific in measuring the quality of care provided by healthcare workers, thus presenting important shortcomings as a quality of care measurement for making management decisions and drawing policy conclusions (Luck, Peabody et al. 2000). Medical records also present challenges such as illegibility when notes are handwritten. With such shortcomings found with medical record reviews, some researchers have suggested direct observation of patient visits as a possible

alternative to medical record reviews (Luck, Peabody et al. 2000). Literature on direct observation is analysed next.

Direct observation and recording of patient visits is a commonly used approach to measure healthcare workers' competencies in developing countries (Nolan, Angos et al. 2001). However, direct observation is expensive, prone to bias because the healthcare worker is aware of being observed, and not objective because of the subjective variations in expert observer judgment (Nolan, Angos et al. 2001). Direct observation and recording of patient visits could work out well if healthcare workers were unaware of the measurement exercise (Nolan, Angos et al. 2001). However, ethically, the healthcare worker and the patient must be informed of the observation or recording, which introduces participation bias because healthcare workers' behaviour may change because of knowing that they are being evaluated (Nolan, Angos et al. 2001). Besides, these authors noted that trained observers are costly, and variation between observers is difficult to avoid. This method was not employed in this study because of the difficulties of truly masking observations where neither healthcare workers nor patients know they are being observed are not possible for ethical and logistical reasons. Standardised patients and clinical vignettes are a promising alternative to direct observation because they are inexpensive and an effective control for case-mix (Peabody, Luck et al. 2000). The literature on the use of SPs as a method to measure the process of care is analysed next.

Standardised patients can be either real patients or healthy individuals who have been trained to provide a reproducible and unbiased presentation of an actual patient case (Tamblyn, Klass et al. 1991). Standardised patients are trained actors who portray patients during an interview and physical examination with a healthcare worker. Standardised patients have been widely used to measure healthcare provider competence in industrialised countries (Rethans and Van Boven 1987, Colliver, Vu et al. 1993, Pieters, Touw-Otten et al. 1994, Badger, deGruy et al. 1995, Colliver and Swartz 1997, De Champlain, Margolis et al. 1997, McLeod, Tamblyn et al. 1997). Standardised patients can capture variation in clinical practice and reproducibly show how individual practitioners vary over time (Colliver, Vu et al. 1993, Swartz and Colliver 1996, Beullens, Rethans et al. 1997, Carney and Ward 1998). Standardised patients can be

either announced or unannounced. With announced SPs, the healthcare provider is made aware that the patient is standardised and is a healthy individual pretending to have a medical concern (Peabody, Luck et al. 2000). With unannounced SPs, sometimes referred to as “mystery patients”, the healthcare provider is not informed that the patient has been trained to perform as a patient (Peabody, Luck et al. 2000).

Studies show that experienced physicians cannot differentiate real patients from unannounced SPs and that history taking, physical examination, findings, and diagnoses are quite similar for announced and unannounced SPs (Peabody, Luck et al. 2000). One advantage of SPs is that they can be trained to accurately and consistently evaluate and report provider performance. In one study by Colliver and Williams (1993), SPs consistently agreed with eighty-three percent of the evaluations of clinical skills made by three faculty physician observers. In another study, SPs were ninety-five percent accurate in portraying the details of illnesses (Colliver and Williams 1993). Standardised patients also provide a replicable case for multiple healthcare providers, thus enabling direct comparison of their performances (Stillman, Swanson et al. 1986). Furthermore, unlike an actual patient, a SP can portray the disease or problem in a way that is most relevant to the particular competence being measured.

However, despite their numerous advantages, the use of SPs also has disadvantages. It can be difficult to separate competence from performance (Stillman, Swanson et al. 1991). Studies show that clinical performance by a single healthcare provider is not consistent across patients and specifics of a disease (Stillman, Swanson et al. 1991); therefore, one SP does not provide a reliable estimate of the healthcare provider performance or competence. Furthermore, unlike real patients, SPs must be paid and trained, making the method expensive (Stillman 1993). For example, Tamblyn, Klass et al. (1991) reported that it took three one-hour training sessions to train SPs and that more experienced SPs performed more accurately than less experienced ones. If the competence of several healthcare providers is being assessed, SPs must be willing to present their stories several times (Peabody, Luck et al. 2000). Certain symptoms cannot be simulated in healthy individuals and require the use of real patients as SPs (Tamblyn, Klass et al. 1991). This method also poses challenges if healthcare providers’ surgical competencies are to be assessed (Kak, Burkhalter et al. 2001). Further, these authors also

noted that SPs require even more intrusion into a healthcare worker's practice than the review of medical records. With these limitations, SPs was not used to measure the competencies of nurses and doctors in delivering ART. The literature review on an alternative method used to measure processes of care, the clinical vignette, is analysed in the section below.

Veloski, Tai et al. (2005) have described a clinical vignette as a brief, written case history of a made-up patient based on a typical clinical situation accompanied by one or more questions exploring what a healthcare provider would do if presented with the actual patient. Vignettes simulate actual patient conditions and are used to evaluate the potential competence of healthcare providers to provide the required care (Peabody, Luck et al. 2004). Vignettes are used to measure processes of care in a wide range of clinic settings (Sriram, Chandrashekar et al. 1990, O'Neill, Gerrard et al. 1995, Glassman, Kravitz et al. 1997). Clinical vignettes are also used to measure the quality of care for a wide range of disease conditions that are inherently comparable across different healthcare facilities and healthcare systems (O'Connor, Blessed et al. 1996, Gorter, Poel et al. 2001, Nordyke 2002). As a quality measurement tool, vignettes can assess the quality of outpatient care without requiring the sampling or analysis of large volumes of existing clinical documents or data, or the subsequent adjustment for variations in case-mix across physicians and facilities (Epstein, Gonzales et al. 2001, Tiemeier, de Vries et al. 2002).

Healthcare providers are usually presented with clinical vignettes representing different disease conditions. The healthcare providers are required to complete a simulated clinical case by responding to open-ended questions that simulate phases of an actual clinic visit such as taking a history, ordering laboratory tests, and drawing a treatment plan including prescribing the required treatment and follow-up plan (Peabody, Tozija et al. 2004). Their responses are recorded and subsequently scored against explicit, evidence-based criteria for the disease being simulated. The scores are used to judge the healthcare provider's competence (Peabody, Tozija et al. 2004). Scores from such vignettes have been shown to be valid measures of the quality of care that the physicians provide to actual patients (Peabody and Anli 2007). Clinical vignettes have been used to study physician behaviour in a wide variety of settings (Hagen, Sumner et al. 2003, Veloski,

Tai et al. 2005). Although vignettes have a higher predictive validity of process of care than abstracted medical records, they do not necessarily show actual clinical practice - having high competence depicted through the vignettes does not necessarily always translate into good practice with actual patients (Das and Hammer 2005, Leonard and Masatu 2005, Das and Leonard 2006, Das, Hammer et al. 2008). However, vignettes have been shown to offer a starting point in evaluating the healthcare providers' competencies (Leonard and Masatu 2005). In prospective validation studies among randomly selected healthcare providers, vignettes have consistently demonstrated greater predictive validity of process than the abstracted medical record (Peabody, Luck et al. 2000). Vignettes have been validated against the gold standard of standardised patient visits, and they reflect actual clinical practice, not just physicians' knowledge (Peabody, Luck et al. 2000, Peabody 2001).

Vignettes have two major advantages. The first is that vignettes are useful for comparison studies because the same case can be given to many healthcare providers (Peabody, Luck et al. 2000, Peabody 2001). In that way, vignettes enable researchers to control for case mix since the same set of vignettes is presented to each healthcare provider. Because of their advantage of controlling for case mix, vignettes have been used to assess and compare competencies among different healthcare providers and between healthcare facilities with different systems of care (Yager, Linn et al. 1986, Colenda, Rapp et al. 1996, Tait and Chibnall 1997, Das and Hammer 2005). The second is that vignettes are inexpensive to administer and straightforward to score, making them particularly useful in developing countries (Peabody, Luck et al. 2000, Peabody 2001). Vignettes have been used in resource-limited settings, such as in Tanzania, to measure healthcare providers' process of care with great success, demonstrating that they are easily administered and are less costly (Leonard and Masatu 2005, Leonard and Masatu 2006a). Because of their various advantages, this study employed paper-based vignettes to assess nurses' and doctors' competencies in the delivery of ART. Operational definitions of key concepts used in this study are presented next.

3.4 Operational Definitions of Terms used in this Study

3.4.1 Nurse-led Antiretroviral Treatment Clinics

In the context of HIV/ AIDS care, these are clinics where nurses in expanded HIV clinical roles and responsibilities initiate patients onto ART, make re-prescription for patients stable on ART, and make appropriate referral to doctors as needed.

3.4.2 Antiretroviral Treatment Initiation

Antiretroviral treatment initiation involves a review of the patient's history, conducting psychosocial assessments, conducting a physical examination, interpreting relevant laboratory test results to make a decision about whether the patient is eligible for ARVs, and writing the first prescription of ARVs for the patient.

3.4.3 An Effective Nurse-Led Antiretroviral Treatment Clinic

In this study, an effective nurse-led ART clinic' is defined as a clinic where nurses in expanded HIV clinical roles can execute their tasks according to national standards and are acceptable to patients and other stakeholders.

3.4.4 Acceptability

Shreffler-Grant (2006) and Marcinowicz, Konstantynowicz et al. (2008) have defined acceptability as the degree to which patients, clinicians, and other stakeholders are comfortable or at ease with a service or willing to use and support it. Sangster-Gormley, Martin-Misener et al. (2011) have defined acceptance as recognition of the role and willingness to work with the nurse in expanded clinical roles. This study adopted these definitions whose attributes include support for and collaboration with nurses in expanded roles, valuing the nurses' prior experience (Goss-Gilroy-Inc 2001, van-Soeren and Micevski 2001, Stolee, Hillier et al. 2006) and team members' awareness and appreciation of the role (Cummings, Fraser et al. 2003, Reay, Patterson et al. 2006).

3.4.5 Facilitator and Barrier

In the current study, a facilitator is defined as a factor that stimulates or expands task reallocation from the medical to the nursing domain, while a barrier is defined as any factor that limits or restricts nurses from executing expanded HIV clinical tasks.

3.4.6 Patient-Centred Care

This study has adopted the definition of patient-centered care from the Institute of Medicine (IOM 2001a), which is: *"Providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions."* The IOM's definition was adopted for the current study mainly because it is consistent with the nursing literature which believes that the person-centred approach is essential in care (Binnie and Titchen 1999, Dewing 2004, McCormack 2004, Nolan, Davies et al. 2004).

3.4.7 Quality of Care

This study has adopted Woodward's definition of quality of care which has three interrelated components (Woodward 2000). The first component is "technical care", which involves using medical knowledge and technology to maximise the benefits of care for the patient while minimising the risks involved. The second component is "interpersonal care", which involves paying attention to the psychosocial aspects of care including the patient-provider relationship, the larger social context in which care is provided and the social circumstances with which the patient must cope. The third component is the "organisation of care", which determines its accessibility, timeliness, the amenities provided and efficiency (Woodward 2000).

3.4.8 Implementation

Implementation is the process by which policy decisions, plans and programmes are operationalised through health systems (Schneider, Coetzee et al. 2010). Implementation is also defined as active and planned efforts to mainstream an innovation (Greenhalgh, Robert et al. 2004), in this case nurse-led ART clinic within the Ugandan health care system.

The methods used to answer the research questions related to the objectives of this study are discussed in the next chapter.

4 Methods

4.1 Introduction

This chapter describes the research methods that I used to answer research questions related to the five objectives of this study. A researcher's choice of methods to use from a range of methodological options is fundamental in shaping the research study. In exploring my options, I selected a sequential qualitative-quantitative-qualitative research method to address Study Objective One, a qualitative research method to address Study Objective Two, and a quantitative research method to address Study Objective Three, as I considered each of them to have a philosophical foundation best aligned with the different research questions. However, in selecting these approaches, I was cognisant of the fact that the field of qualitative and quantitative research methods spans a broad range of disciplines and incorporates a variety of research strategies – creating complexities. Nonetheless, the preliminary conceptual framework that I developed mitigated some of these complexities as it guided the research process.

The chapter is divided into four sections. The first section presents a discussion of the methods I employed to examine the literature, and the second section presents a description of the preliminary conceptual framework that guided this study. The third section presents the description of the methods I used to develop data collection tools, the data collection process, data management, and data analysis, while the last section presents a description of the ethical issues related to this research.

4.2 Methods used for the Literature Review

I conducted an integrative literature review to understand the factors that act as facilitators and barriers to the development and implementation of effective nurse-led ART clinics in Uganda. The vastness of the research-objectives and –questions, together with the finding that the study area was grey at the time compelled me to choose an integrative literature review rather than a systematic literature review. Contrary to a systematic review, an integrative review summarises a broad body of research that uses

diverse study designs and methods to facilitate a fuller understanding of complex phenomena (Whittemore and Knafl 2005), such as the development and implementation of nurse-led ART clinics. I conducted an initial literature review during the months of July, August, and September 2011 to identify what was known as well as the information gaps on the subject, and to develop a preliminary conceptual framework that guided this study. I conducted a final literature review during the months of July, August, September, and October 2016 to learn more about the new developments in the area of nurse-led ART delivery to help locate my study findings.

I searched and reviewed PubMed, CINAHL, Google Scholar, and Cochrane Systematic Reviews electronic databases to identify relevant papers on task shifting in Uganda and in SSA. I did not specify the dates of publication so that I would be able to identify as many papers as could be available. I only included studies published in the English language in this review. I used the following key words in the search: “nurse-led antiretroviral clinics”, “nurses in expanded HIV clinical roles”, “nurses in expanded roles”, “nurse practitioner”, and “nurse prescribing”. I used these keywords either alone or in combinations with “Sub-Saharan Africa”, “resource-limited/poor/constrained setting”, “facilitators”, “barriers”, “enablers”, “inhibitors”, “development”, and “implementation”. The number of studies I identified in this search are presented in Table 4.1 below.

Table 4-1: Number of studies identified with each of the search terms

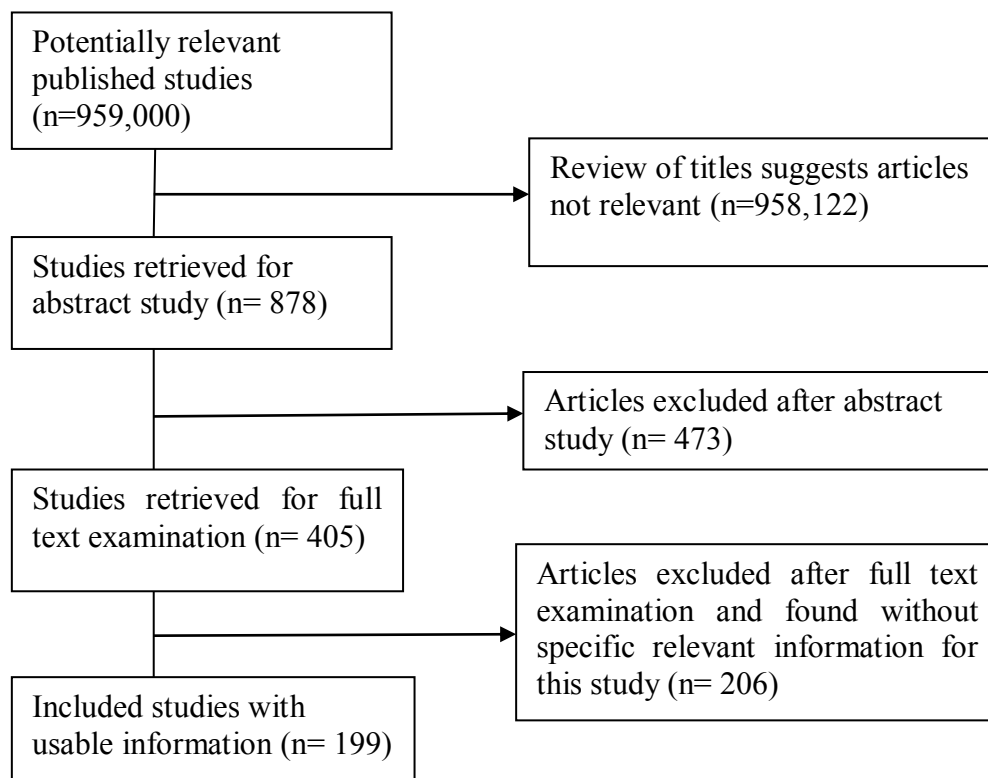
S/N	Key word	Number of Studies Identified in PubMed, CINAHL, Google Scholar, and Cochrane Systematic Reviews Databases
1	Nurse-led antiretroviral clinics	20,100
2	Nurses in expanded HIV clinical roles	39,800
3	Nurses in expanded roles	271,000
4	Nurse practitioner	559,000
5	Nurse prescribing	164,000
6	Nurse-led antiretroviral clinics and Sub-Saharan Africa	468
7	Nurses in expanded HIV clinical roles and Sub-Saharan Africa	16,600
8	Nurse prescribing and Sub-Saharan Africa	18,100
9	Nurse-led antiretroviral clinics and Sub-Saharan Africa and “resource-limited/poor/constrained setting”, “facilitators”, “barriers”, “enablers”, “inhibitors”, “development”, “implementation”	1,010
10	Nurses in expanded HIV clinical roles and Sub-Saharan Africa and “resource-limited/poor/constrained setting”, “facilitators”, “barriers”, “enablers”, “inhibitors”, “development”, “implementation”	3,890
11	Nurses in expanded roles and Sub-Saharan Africa and “resource-limited/poor/constrained setting”, “facilitators”, “barriers”, “enablers”, “inhibitors”, “development”, “implementation”	8,940
12	Nurse practitioner and “Sub-Saharan Africa”, “resource-limited/poor/constrained setting”, “facilitators”, “barriers”, “enablers”, “inhibitors”, “development”, “implementation”	5,361
13	Nurse prescribing and Sub-Saharan Africa, “resource-limited/poor/constrained setting”, “facilitators”, “barriers”, “enablers”, “inhibitors”, “development”, “implementation”	48,900

I also complemented the electronic search by conducting a manual scan and reviewing the bibliographies of relevant papers. Furthermore, I obtained and reviewed unpublished documents (grey literature) from the Uganda MoH library as well as those from digital dissertations and reports on governmental and nursing organisation websites – if the

literature related to the research questions of this particular study. To access more grey literature, I directly contacted some of the authors of included papers to locate articles they had quoted but which were unpublished or inaccessible.

Initially, I found ninety-eight articles whose titles and abstracts included factors affecting the development and implementation of task shifting in HIV programmes, particularly nurse-led ART, and thus I considered them critical for this review. Of the ninety-eight articles, sixty-seven were full text articles, of which nine were systematic reviews. I found all these sixty-seven full text articles relevant and I thus included them in this study. However, because I found few studies on task shifting in HIV programmes in SSA, I decided to also review research on general task shifting conducted in SSA as well as in industrialised countries to capture fully the emerging issues that arose from the literature. In doing so, I found an additional one hundred and thirty two papers particularly relevant to this study, making one hundred and ninety nine papers in total, as summarised in Figure 4.1 below. Although it is useful to identify which papers are relevant or useful to a particular study by eliminating irrelevant or weak studies, I did not assess the validity or the closeness to the truth of the papers that I reviewed. I did not distinguish evidence from opinion, assumptions, and beliefs in those papers mainly because the study of factors influencing nurse-based task shifting in Uganda and other countries in SSA is relatively new and, thus little evidence is available. Therefore, at this particular time of evidence generation it necessary to investigate as many factors as possible that may affect the effectiveness of nurse-led ART clinics in Uganda.

Figure 4-1: Flowchart Summarising the Number of Published Literature used in this study



The initial literature review, conducted in July, August, and September 2011, led to the development of a preliminary conceptual framework of factors influencing the development and implementation of effective nurse-led ART clinics. This preliminary conceptual framework is discussed next.

4.3 Preliminary Conceptual Framework of Factors Influencing the Development and Implementation of Nurse-Led ART Clinics

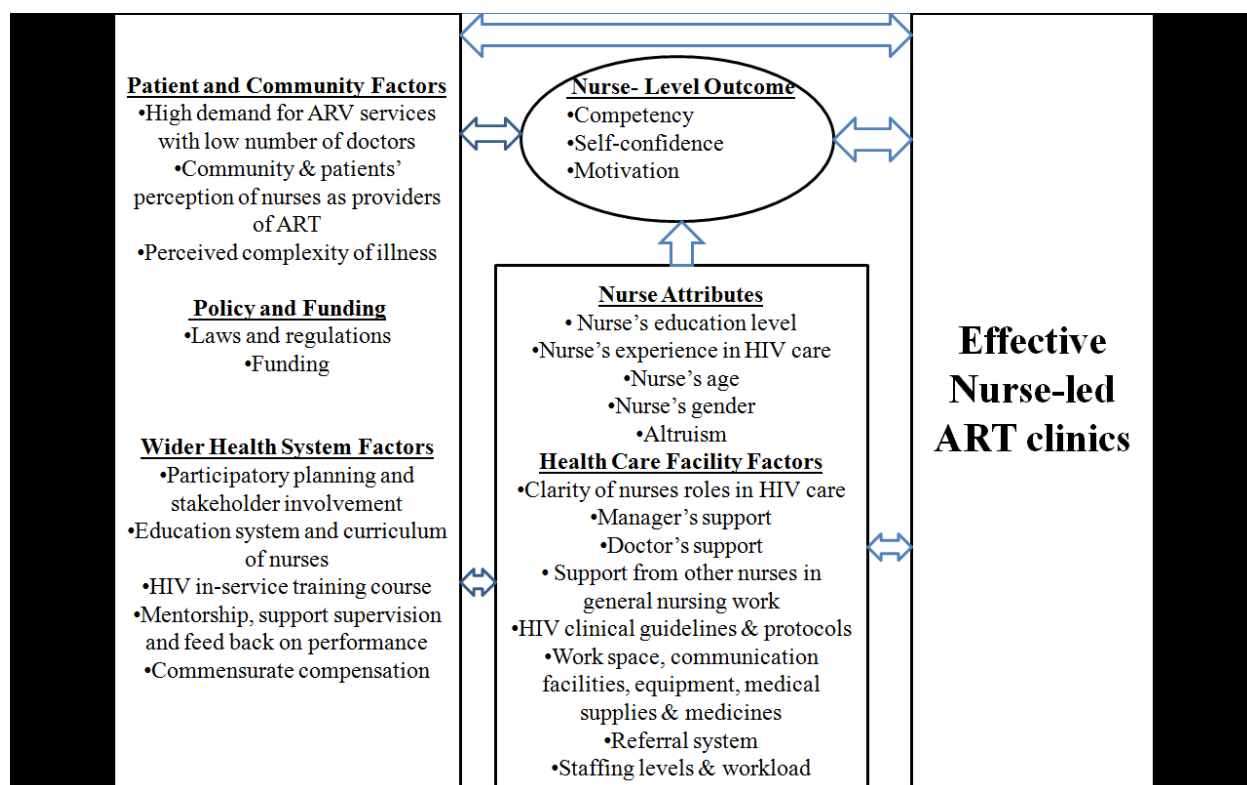
After conducting a thorough literature search between July and September 2011 on the factors influencing the development and implementation of effective nurse-led ART clinics in Uganda and elsewhere in SSA, I found that few studies on the subject existed at the time, as compared to vast amounts of literature on the factors influencing the implementation of health care reforms. I, therefore, relied heavily on literature on the factors influencing the implementation health care reforms to understand which factors might influence the development and implementation of effective nurse-led ART clinics

in Uganda. I hypothesised that factors that affect the successful implementation of health sector reforms would be the same factors that would influence the development and implementation of effective nurse-led ART clinics, a reform in itself. To enrich the framework further, I also used the literature on factors that affect the development and implementation of advanced nurse roles in industrialised countries.

Franco, Bennett et al. (2002) and Rowe, Savigny et al. (2005) have identified numerous factors to influence the success of health sector reforms, namely: factors within the patient and community, policy and funding, wider health system, healthcare facility, and personal nurse environments. Other researchers have also identified similar factors within those environments which operate together to influence how healthcare workers take up new initiatives (Woodward 2000, Grimshaw, Thomas et al. 2004, Rowe, Savigny et al. 2005, Shaw, Cheater et al. 2005, Wallin, Ewald et al. 2006, Mbindyo, Gilson et al. 2009). Similarly, literature in SSA and elsewhere in the world has revealed that the same categories of factors act as either facilitators or barriers to the development and implementation of advanced nurse roles (Stringer, Zulu et al. 2006, Bedelu, Ford et al. 2007, Miles, Clutterbuck et al. 2007, Griensven, Naeyer et al. 2008, Hulela, Puvimanasinghe et al. 2008, Van-Griensven, De-Naeyer et al. 2008, Bussmann, Ndwapi et al. 2009, Morris, Chapula et al. 2009, Shumbusho, Griensven et al. 2009, Zachariah, Ford et al. 2009, Sangster-Gormley, Martin-Misener et al. 2011, Georgeu, Colvin et al. 2012, Munga, Kilima et al. 2012, Davies, Homfray et al. 2013, Emdin, Chong et al. 2013, Nyasulu, Muchiri et al. 2013, Sangster-Gormley, Martin-Misener et al. 2013, O'Malley, Asrat et al. 2014, Mijovic, McKnight et al. 2016).

With this insight, I constructed the preliminary conceptual framework, which divides factors influencing the development and implementation of effective nurse-led ART clinics in Uganda into those six categories (Figure 4.2). This framework is described further in this section.

Figure 4-2: Preliminary Conceptual Framework of Factors Influencing the Development and Implementation of Effective Nurse-led ART Clinics



4.3.1 Patient and Community Environment

The literature has identified that the successful development and implementation of nurse-based task shifting is influenced by the demand for health services amidst the shortage of doctors to provide them (Komnenich 1998, Duffy 2001, Bryant-Lukosius, DiCenso et al. 2004), community and patient perceptions of nurses as providers of expanded clinical services (Ndiwane 2000, Kyaddondo and Whyte 2003, Boyer, Protopopescu et al. 2011, Mukora, Charalambous et al. 2011, Assefa, Kiflie et al. 2012), and the perceived complexity of illness (Piro, Landefeld et al. 2001, Fletcher, Baker et al. 2007, Brodsky and Van-Dijk 2008, Van-Offenbeek, Sorge et al. 2009, Niezen and Mathijssen 2014).

4.3.2 Policy and Funding Environment

Government policies and funding have been found critical in the development and implementation of expanded nurse roles, while their absence leads to numerous challenges including the ad hoc and inconsistent development of nurses' expanded roles, inadequate resources, restricted role domains, and limited opportunities for planned change and innovation (Cameron and Masterson 2000, Guest, Peccei et al. 2001, USAID/HPI 2010, Georgeu, Colvin et al. 2012, Dambisya and Matinhure 2012, McCarthy, Voss et al. 2013, Baine and Kasangaki 2014, AMREF 2015, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016, Spies, Gray et al. 2016).

4.3.3 Wider Health System Environment

Permissive job descriptions, commensurate remuneration, and long-term human resource planning for the role contribute positively to the development and implementation of expanded nurse roles, while their absence contributes negatively (Goss-Gilroy-Inc 2001, van-Soeren and Micevski 2001, Cummings, Fraser et al. 2003, DiCenso, Paech et al. 2003, Stolee, Hillier et al. 2006, Sangster-Gormley, Martin-Misener et al. 2011, Sangster-Gormley 2013, Sangster-Gormley, Martin-Misener et al. 2013). Unlike established nursing roles, the complexity of implementation of the expanded clinical nurse role requires prior planning for role introduction, mentorship for the nurses and understanding of the interface between these nurses and other professional staff, lack of which are recognised as barriers (van-Soeren and Micevski 2001, Cummings, Fraser et al. 2003, Stolee, Hillier et al. 2006, Thrasher and Purc-Stephenson 2007). Nurses' pre-service and in-service training are other factors likely to influence the ability of nurses to execute expanded clinical roles competently (O'Brien, N et al. 2001, Koenig, Leandre et al. 2004, WHO 2004, WHO 2005a, Ford, Reuter et al. 2006, Bedelu, Ford et al. 2007, Bolton-Moore, Mubiana-Mbewe et al. 2007, WHO 2007a, WHO 2007b, WHO 2007c, Chopra, Munro et al. 2008, Shumbusho, Griensven et al. 2009, Zachariah, Ford et al. 2009, Callaghan, Ford et al. 2010, Georgeu, Colvin et al. 2012). Studies conducted in SSA on nurse-based task shifting have also found that factors such as adequate compensation, supervision, and opportunities for career development are important to its success (Lehmann, Van-Damme et al. 2009, Shumbusho, Griensven et al. 2009, Celletti, Wright et al. 2010, Jacobi 2010).

4.3.4 Healthcare Facility Environment

Teamwork, leadership support, authority and autonomy, workload, role clarity, recognition, physical comfort, flexible scheduling, organisational policies, professional development opportunities, salary, participation in decision-making, innovation, and workplace safety are key facilitators to the introduction of expanded nurse roles (Schalk, Bijl et al. 2010, Kerzman, Van-Dijk et al. 2015). The lack of standard job descriptions, conflicting expectations, inadequate manager and doctor support, workload and remuneration issues, organisational culture, lack of long-term human resource planning for the role, and lack of nurse autonomy, have been found to contribute negatively to expanded nurse role implementation (Goss-Gilroy-Inc 2001, van-Soeren and Micevski 2001, Cummings, Fraser et al. 2003, DiCenso, Paech et al. 2003, Stolee, Hillier et al. 2006). Other barriers identified in various healthcare facility settings include doctor resistance, staff's lack of understanding of the expanded nurse role, and limited direct contact of the nurses in expanded nurse roles with other staff (Goss-Gilroy-Inc 2001, van-Soeren and Micevski 2001, Cummings, Fraser et al. 2003, DiCenso, Paech et al. 2003, Stolee, Hillier et al. 2006). Similarly, other researchers have found that factors such as working conditions, monitoring systems, clarity of responsibilities and organisational goals, organisational services and work processes, task complexity, resource availability to carry out the job, availability of standards, training, supervision, and communication mechanisms may motivate healthcare workers to implement new initiatives (Martínez and Martineau 1998, Rowe, de Savigny et al. 2005, Uzochukwu and Onwujekwe 2005, Deller, Tripathi et al. 2015). Similarly in SSA, factors found to influence the development and implementation of effective nurse-led ART clinics include supervision and management support (Ndiwane 2000, Tavrow, Young-Mi et al. 2002, Campbell and Scott 2009, McAuliffe, Bowie et al. 2009, Assefa, Van-Damme et al. 2010, Celletti, Wright et al. 2010) and relationships with other healthcare workers (Ndiwane 2000, Campbell and Scott 2009, McAuliffe, Bowie et al. 2009). Adequate staffing to prevent excessive workload (Agyepong, Anafi et al. 2004, Mangham and Hanson 2008, McAuliffe, Bowie et al. 2009), access to higher-level staff for service provision support (Wilson, Landon et al. 2005, Wools-Kaloustian, Sidle et al. 2009), and status of healthcare workers within the organisation (Kyaddondo and Whyte 2003, Schneider, Hlophe et al. 2008).

4.3.5 Personal Nurse Environment

Several studies have revealed that practitioners are motivated to deliver services they believe will make a positive contribution to the quality of patient care, even when working conditions may not be favourable or the tasks are complicated (Collins, Jones et al. 2000, Tye and Ross 2000, Rafferty, Ball et al. 2001, Kinley, Czoski-Murray et al. 2002, Marsden, Dolan et al. 2003, Easton, Griffin et al. 2004, Norris and Melby 2006, Zangaro and Soeken 2007, McKenna, Richey et al. 2008, Jacobi 2010, McElhinney 2010). Nurses' gender, education level, years of experience, personal experience with the health condition, and age have also been found to influence the performance of nurses in expanded roles (Collins, Jones et al. 2000, Tye and Ross 2000, Rafferty, Ball et al. 2001, Kinley, Czoski-Murray et al. 2002, Marsden, Dolan et al. 2003, Easton, Griffin et al. 2004, Norris and Melby 2006, Zangaro and Soeken 2007, McKenna, Richey et al. 2008, Jacobi 2010, McElhinney 2010). Pre-service background and education also influence the successful implementation of task-shifting initiatives (Agyepong, Anafi et al. 2004, Campbell and Scott 2009).

4.3.6 Nurse-Level Outcomes

Studies on the effect of health sector reforms on human resources for health have found that that healthcare worker competence, self-confidence, and motivation are key pathways through which numerous factors within the external and internal healthcare worker environments influence the performance of healthcare workers in expanded roles (Bennett and Franco 1999, Martineau and Buchan 2000, Donabedian 2003, Uzochukwu and Onwujekwe 2005, Kabene, Orchard et al. 2006, Ssengooba, Rahman et al. 2007, Philips, Zachariah et al. 2008). In Ethiopia, Jacobi (2010) in a study on task shifting as well found healthcare workers' competence, self-confidence, and motivation to be key determinants of their performance in expanded roles. Indeed, competence, self-confidence, and self-motivation have been reported to be vital qualities required of nurses in expanded roles to successfully implement new roles (Bamford and Gibson 2000, Tye and Ross 2000, Read 2001, Scholes and Vaughan 2002, McElhinney 2010, Jones, Edwards et al. 2011, Georgeu, Colvin et al. 2012). In the USA, clinical nurse specialists identified that clinical competence and confidence in their ability, interpersonal skills and motivation all played an important part in facilitating their role development (Hamric and Taylor 1989).

Although this preliminary conceptual framework guided the research process of this study, I also expected it to continue evolving into a modified version as the data was collected, analysed, and interpreted. Preparation for the fieldwork is discussed next.

4.4 Preparation for Fieldwork

To prepare for fieldwork, I made a plan that included introducing the study objectives to the Ministry of Health top leadership, recruiting and training of the research assistant, and implementation modalities. The process undertaken in each step of the plan will be discussed briefly in this section.

4.4.1 Introducing the Study to the Ministry of Health Leadership

I approached the National AIDS Control Programme manager, MoH (Uganda), to explain the study aims and objectives, and to request permission to conduct this study. The programme manager was enthusiastic that the study findings would be handy in supporting the policy formulation process on nurse-led HIV care and pledged maximum support to the study. The manager granted me provisional permission, pending approval from the programme research committee, and gave me a formal letter introducing the research to the managers of the HIV clinics of interest to the study. With that permission, I was ready to recruit and train the research assistant.

4.4.2 Recruitment and Training of Research Assistant

After receiving the necessary approval from the MoH leadership, I placed an internal advert on the MoH notice board and recruited one graduate social scientist with experience in conducting qualitative research. I trained the research assistant for three days on research protocol including data collection methods, data collection tools, ethics of research with human subjects, and questionnaire administration. The training involved numerous role-plays simulating the interviews. The role-plays ensured that I refined my interviewing techniques to promote consistency in the administration of the data collection tools. They also enabled the research assistant to practice note taking and audio recording of the interviews. This training thus aimed at ensuring consistent, high quality, and ethical data collection. The research assistant and I then pre-tested the

research tools to refine them and to enhance our research skills further. The role of the research assistant throughout the research process was to audio-record and take notes while I conducted the interviews. However, to maintain rigour, I supervised the research assistant at all times during the data collection exercise to ensure that all the data arising from the interviews were well captured and accurate. In the next section, I present a description of the data collection and analysis implementation strategy.

4.5 Implementation Strategy

I divided this study into three sub-studies to ease the implementation of data collection and analysis. These included: (i) questionnaire survey with patients followed by focus group discussions and semi-structured interviews with patients to get explanations for the survey findings; (ii) semi-structured interviews with nurses, doctors, policymakers, and other related stakeholders; and (iii) survey to measure nurses' and doctors' competencies in HIV care using HIV clinical vignettes. The study objectives, methods, participants, and the sample size are summarised in Table 4.2 below.

Table 4-2: Study Objectives, Methods, Participants, and Sample Size

Objective	Methods	Participants and Sample Size
1. Assess patients' experiences with, attitudes and views towards nurses as providers of antiretroviral treatment and the factors associated with them	Survey Questionnaire, Focus Group Discussions, and Semi-structured Interviews	Survey questionnaires with 279 patient-participants, 4 Focus Group Discussions with patient-participants, and 2 Semi-structured interviews with patient-participants
2. Explore the key factors that act as facilitators or barriers to the development and implementation of effective nurse-led antiretroviral treatment clinics based on the perceptions of nurses, doctors, policymakers, and other related stakeholders	Semi-structured Interviews	26 nurses, 10 doctors, 3 policymakers, 3 national antiretroviral treatment trainers, 3 officials from Uganda Nursing and Midwifery Council, 3 officials from Uganda Medical and Dental Practitioners' Council, and 2 regional antiretroviral treatment coordinators
3. Determine nurses' and doctors' competencies in managing HIV-related disease conditions including the provision of antiretroviral treatment	Survey with paper-based HIV clinical vignettes	90 nurses and 45 doctors
4. Develop a conceptual framework of factors influencing the development and implementation of effective nurse-led antiretroviral treatment clinics	Analysis of the study results of research questions related to objectives 1, 2, and 3	Informed by the study results of research questions related to objectives 1, 2, and 3
5. To propose strategies that could ensure the development and implementation of effective nurse-led antiretroviral treatment clinics	Analysis of the study results of research questions related to objectives 1, 2, and 3	Informed by the study results of research questions related to objectives 1, 2, and 3

For each sub-study, I discuss the process I undertook to develop the data collection tools, the data collection process, and the data management process. In the next section, I present a detailed description of the questionnaire survey with patients.

4.6 Sub-Study One: Questionnaire Survey of and Focus Group Discussions with Patients

To understand patients' views on nurse-led ART clinics, I employed a sequential qualitative–quantitative–qualitative research method, starting with FGDs, followed by survey questionnaires, and lastly with FGDs and SSIs. I followed the core tenets of a sequential mixed methods, whereby I conducted and analysed each phase separately with the results of the first phase being essential and informative for planning the next phase and so on. The initial FGDs with patients helped me to develop and refine the patient survey questionnaire tool, significantly influencing its content and wording. I used the resultant patient questionnaire to elicit the views of 279 patients on nurse-led ART clinics. This survey brought to light key factors that determine patients' acceptance of nurses as providers of ART, which required further investigations. The final FGDs and SSIs that followed the survey helped me to gain explanations, deeper understanding, and meaning of the key findings from the questionnaire survey. They brought to light the reasons why certain factors affect patients' acceptability of nurses as providers of ART, and which ART-specific tasks patients are willing to receive from nurses and why. They also enabled me to explore patients' definitions of quality ART services and a competent ART provider as well as why they defined them so. In other words, the initial FGDs with patients determined which factors were eventually investigated by the questionnaire survey, and the findings of the survey determined which factors were ultimately investigated by later FGDs and SSIs with patients. Thus, by using a combination of qualitative and quantitative research methods in a sequential order to answer research questions related to Objective One, I was able to gain a comprehensive understanding of patients' views and acceptability of nurses as providers of ART and the associated factors.

In the next section, I discuss the three major steps I took to conduct the patient questionnaire survey, starting with developing the questionnaire, followed by data collection, and lastly by data management and analysis.

4.6.1 Development of the Patients' Survey Questionnaire

I developed patients' survey questionnaire using a three-step process including reviewing the literature to generate questionnaire items, conducting of FGDs to refine the questionnaire, and piloting of the questionnaire to assess its feasibility as well as to improve its validity. I briefly discuss each of these steps in this section.

4.6.1.1 Literature Review to Design the Survey Questionnaire

Despite conducting a comprehensive literature review to identify previously validated questionnaires for measuring patients' views on and acceptability of nurses as providers of ART that could be suitable for adaptation, I did not find such suitable validated questionnaires in the literature. I thus decided to develop a questionnaire in close consultation with my supervisor. I generated items for this questionnaire from associated literature, experts in this field, and proposed study participants (Priest, McColl et al. 1995, Bowling 1997, Rattray and Jones 2007) to guarantee content validity, discussed in detail in Section 4.12.2.

Specifically, I relied on ART-related care activities as spelt out by the MoH of Uganda (2009) ART guidelines and from the WHO (2008a) global guidelines on task shifting in HIV care to develop the questionnaire items. From these activities, I identified the sub-scales and ensured that the items of the questionnaire represented them. As advised by Oppenheim (1992) and Bowling (1997), during item generation, I revisited the research questions frequently to ensure that items remained relevant and reflected the key concepts detailed within the specific research questions of this study.

I included a mixture of both positively and negatively worded items to minimise the danger of acquiescent response bias - that is, the tendency for participants to agree with a statement or to respond in the same way to different items (Ware 1978, Fitzpatrick 1991). I also included free open questions at the end of the questionnaire to let the participants expand upon answers and provide more in-depth responses. I avoided presenting controversial or emotional items at the beginning of the questionnaire,

preferring to present them at the end to prevent biased response from the beginning. I presented questions that captured demographic and clinical data at the end of the questionnaire to engage the participants and prevent boredom. I avoided questions that lead or include double negatives and those that are double-barrelled. Overall, the questionnaire had 10 sections (Appendix 1).

4.6.1.2 Focus Group Discussions to Refine the Patient Survey Questionnaire

I conducted FGDs with patients to refine the questionnaire because, to the best of my knowledge, this was the first study in Uganda to assess patients' views on nurse-led ART clinics, thus little is known about this subject in the country. Focus group discussions are useful in developing and refining patient survey tools because they can identify the key issues that are most meaningful to patients, and the language they do and do not use while talking about these issues (Morgan 1993, Templeton 1996, Edmunds 2000). They also help to generate in-depth qualitative data on grey areas of research (Kitzinger 1995, Powell and Single 1996), as the case is in this particular study.

Altogether, I conducted three FGDs with patients. These interviews were conducted in the respective meeting rooms of Jinja Hospital, Naguru Health Centre IV, and Bukulula Health Centre IV. I selected these healthcare facilities because of convenience as they are relatively near my area of residence (Uganda's capital, Kampala) and because their managers were enthusiastic about participating in this study.

Each focus group interview was comprised of eight patients receiving ART, purposely selected with the help of the HIV clinic manager at each healthcare facility. I explained the aim and the process of the group discussions to the potential participants and requested them to participate in the study. All the potential participants I approached consented to participate in this study and they were subsequently recruited.

Although focus group participants do not constitute a random sample, I recruited equal numbers of males and females to reflect the population of interest (Stewart and Shamdasani 1990). I explained to the study participants for the second time the purpose of the discussions, which was to seek their opinions on the relevance, clarity, cultural, and technical appropriateness as well as the comprehension of the constructed questionnaire items. I encouraged them to voice their views on new items they considered important but were not included a priori. I also encouraged them to discuss each question in detail until all the questions were clear to each of them (Krueger 1994).

I inquired from the participants which healthcare worker characteristics and qualities they considered important to ensure satisfaction with the care they received at the HIV clinic. This process eliminated three items, two of which were perceived redundant and one which the participants found challenging to comprehend. For many of the items that remained, I refined the wording based on participants' comments. For example, I changed "*examine me well*" to "*examine me in a way that made me feel at ease*" because that is what most participants preferred. Furthermore, I requested the focus group participants to review several potential response scales that included agreement scales with five points, rating scales, and a dichotomous scale (that is: *no-yes*). Participants expressed preference for the dichotomous scale (*no-yes*) with an additional alternative (*unsure*) among the responses.

At the end of each FGD, the research assistant who had been taking notes during the session summarised and read back the discussions to the participants. Participants either agreed to or modified parts of the summary to ensure its accuracy. The discussions were audio-recorded to facilitate analysis of participants' responses and their suggestions for improvement of the questionnaire items.

These discussions lasted between 90 to 120 minutes. At the end of the interviews, I immediately transcribed the audio-recorded tapes verbatim. To ensure transcription accuracy, I compared a random selection of the transcripts to audiotape content. Insights from the analysis of the qualitative data helped me to design an instrument that was more sensitive to participants' meanings and interpretations (Coyle and Williams 2000).

4.6.1.3 Piloting the Survey Questionnaire Tool for Patients

I conducted a pilot test of the evolved patient survey questionnaire tool to establish its validity and reliability further (Creswell and Miller 2000). As advised by Fitzpatrick (1991), the piloting of the questionnaire helped me to assess further its content and face validity.

To recruit the patient-participants for the pilot testing, the HIV clinic managers helped me to reach out to the potential participants. I administered the questionnaire to 30 patient-participants receiving ART services at Naguru Health Centre IV, who agreed and consented to take part in the interviews. The research assistant helped with audio recording of these interviews.

To enhance the internal consistency of this questionnaire, I analysed the data collected from the pilot test using Statistical Package for Social Sciences (SPSS), for two key pieces of information including “correlation”, found in the correlation matrix, and “reliability coefficient” (Cronbach’s alpha), found in the “view alpha if item deleted” column. During this process, I eliminated statements that had zeros, ones, and negative correlation. I then viewed the Cronbach’s alpha “if item deleted” column to determine if deletion of an item raised it. I deleted items that increased Cronbach’s alpha hence substantially improving reliability while at the same time being mindful about preserving the content. As a result, I deleted only five items. The final questionnaire had a reliability coefficient (Cronbach’s alpha) of 0.80 that I considered acceptable. The acceptable reliability coefficient (Cronbach’s alpha) is 0.70 or higher (Nunnally and Bernstein 1994, Bland and Altman 1997, DeVellis 2003).

After the first pilot and reliability coefficient (alpha) test, the revised version of the questionnaire was, for the second time, piloted with thirty patients attending the HIV clinic at Kayunga Hospital, to analyse further the comprehensibility and clarity of the questions. The second pilot helped me to identify further the items that lacked clarity and those that were not appropriate. During this stage, I constantly referred to the original

research questions to ensure they were being addressed, and only retained items that reflected the underlying theoretical domains of the questionnaire. I used the results of the second pilot to make the final appropriate changes on the questionnaire. For example, I identified one item with high levels of non-response and reworded four others. I added the response alternative 'Not Applicable' because I found out that some questions were not relevant to some of the clients.

4.6.2 Data Collection from Patients using the Questionnaire

I followed three steps to collect the data necessary to answer research questions related to Objective 2, including the selection of study sites, the calculation of sample size, and the administering of the questionnaire.

4.6.2.1 Selection of Study Sites

To select the ART clinic study sites, I followed six steps including (a) defining the population; (b) choosing the relevant stratification; (c) listing the population; (d) listing the population according to the chosen stratification; (e) choosing the sample size; and, (f) using a simple random systematic sampling strategy to select the sample.

The definition of the population is all the ART clinics in the Central and East-Central regions of Uganda. I categorised these clinics into four clusters including rural-based nurse-led ART clinics; rural-based doctor-led ART clinics; urban-based nurse-led ART clinics; and, urban-based doctor-led ART clinics. I chose this categorisation to take care of important variations of urban and rural, as well as doctor-led and nurse-led clinics, during the sampling process, thus ensuring representation of varied perceptions of the study participants. To select the ART clinic study sites, I visited the MoH resource centre to get the list of ART clinics in the study area, the Central and East-Central regions of Uganda. This list of ART clinics at the MoH resource centre provided a ready-made sampling frame for this study. At the time of this study, there were 48 ART clinics in the public sector including 13 rural-based doctor-led ART clinics, 14 rural-based

nurse-led ART clinics, 7 urban-based nurse-led ART clinics, and 14 urban-based doctor-led ART clinics. I aimed at studying patients receiving ART from eight clinics, two from each category.

I employed simple random sampling technique to select two clinics from each category. I assigned consecutive numbers from 1 to N in each of the clusters, next to each clinic – where N was the total number of clinics in a particular cluster. I then used the Excel computer program to assign random numbers to each of the clinics in the four clusters. I employed disproportionate stratification, where the sample size of each of the stratum is not proportionate to the size of the same stratum. I used the first two random numbers to select two ART clinics from each cluster, coming out with eight ART clinics (Table 4.3).

Table 4-3: Number of Patients Interviewed From Each of the Selected Antiretroviral Treatment Clinics

Serial Number	Name of health Facility	Total number of ARV clients in each clinic at the time of study	Number of ARV clients interviewed in each clinic	Location of the clinic	Type of clinic
1	Masaka Hospital	520	58	Rural	Nurse
2	Jinja Hospital	432	49	Urban	Doctor
3	Bukulula HCIV	233	27	Rural	Nurse
4	Kiswa HCIV	342	38	Urban	Doctor
5	Kangulumira HCIV	137	16	Rural	Nurse
6	Buwenge HCIV	106	13	Urban	Doctor
7	Naguru HCIV	479	54	Urban	Doctor
8	Kiruddu HCIV	212	24	Rural	Nurse
Totals		2461	279		

4.6.2.2 Calculation of Sample Size of Patients for the Survey

The sample size of patients to take part in sub-study one, patients' views on nurse-led ART clinics, was calculated based on confidence intervals around the proportion of patients who accept nurses as providers of ART, the primary interest. I used the Hulley et al. (2001) and Eng (2003) formula to calculate the total number of patient-participants required for this study. This formula, designed to measure a population characteristic in

terms of proportion where the primary outcome variable is categorical and binary, is shown in Figure 4.3 below.

Figure 4-3: The Hulley et al. and Eng formula used to calculate the sample size of patient-participants to undertake the survey

$$N = 4 z_a^2 P(1-P)/W^2$$

Where:

- P is the expected proportion who have the characteristic of interest, in this particular study those patients who accept nurses as providers of ART
- W is the width of the expected confidence interval (equal to twice the “margin of error”)
- z_a is a value from the normal distribution related to and representing the confidence level equal to 1.96 for 95 percent confidence

I estimated the proportion of interest with a 95 percent confidential interval of ± 6 percent. I used 50 percent for P, since no previous study could be found to obtain an estimate of it. An estimation of proportion of patients who accept nurses as providers of ART at 50 percent is a conservative solution that yields a maximum sample size. With those assumptions, $p = 0.5$ and $W = 0.12$, and using the formula in Figure 4.3 above, I calculated a sample size of 267 patient-participants as the most appropriate for this study. However, I ended up interviewing 279 patients because of the extreme interest expressed by some of them to be included in the study. The ART clinics selected for this study and the number of patient-participants recruited from each of them is shown in Table 4.3 in the previous section.

To make initial contacts, I telephoned each of the managers of the selected healthcare facilities to introduce the study-related activities, to request permission to interview

patients, and to seek an appointment with them. I recruited patients from each of those outpatient ART clinics.

4.6.2.3 Administering the Survey Questionnaire to the Patients

The research assistant and I would arrive at the clinics thirty minutes before the clinic opening time. The first patient to interview that day would be determined by picking one piece of paper from a box with five pieces of paper bearing numbers one to five. The number on the selected paper determined the first patient to interview on that day from the list of patients who would have already registered at the clinic. I would then select the subsequent participants by requesting alternate patients to consent to an interview at the end of their clinic visit. I would read out the consent form (Appendix 3) and obtain an informed written consent from each of the patients who agreed to participate in the study before starting to administer the questionnaire using a face-to-face interview style. Interviewing alternate patients helped to reduce patient waiting times. I conducted interviews throughout the clinic opening hours (8.00 a.m – 5.00 p.m), while the research assistant helped with audio recording of the interviews and taking notes. I would continue interviewing participants as long as there were patients in the waiting room. I conducted these interviews in a private space within the clinic, or under a tree shade, in case there was no private space. The individual interviews lasted between 45 to 60 minutes. It took approximately 6-10 clinic days at each of the participating ART clinics to interview all the required number of participants. Since most of the ART clinics opened for one day each week, it took 6-10 weeks to collect the required data from each of them.

4.6.3 Inclusion Criteria

Patients who were 18 years or older and had been on ART for at least six months were eligible. It was presumed that after six months on ART those patients had gained significant experience to enable them to give informed opinions.

4.6.4 Quantitative Data Management and Analysis

To ensure that the data was of good quality, I crosschecked all the questionnaires for completeness on a daily basis during the data collection process. I developed an analysis screen in Stata 9 software in which I double-entered all the questionnaires. Before analysing this data, I generated and cleaned range and inconsistency errors using the software accordingly. During analysis, the main outcome measure was the attitude questions that highlighted patients' acceptability of the nurse-led ART clinics. I divided the outcome measures into two categories representing acceptability and non-acceptability of the nurse-led ART clinics. I coded the quantitative data and analysed it using SPSS 20 software. Since this study is mainly exploratory in nature, little research has been done in this area, so I decided to use descriptive analysis for all the items in the questionnaire to capture patients' attitudes of nurses as providers of ART, as opposed to inferential statistics.

4.6.5 Focus Group Discussions with Patients

After the survey, I conducted FGDs to gain a deeper understanding of the survey results. Focus group discussions are useful in exploring the subjective meanings behind quantitative survey responses (Gandhi, Parle et al. 1997). Their advantage stems from their ability to identify a range of perspectives held, thus aiding clarification and qualification of those views through group dynamics (Morgan 1996, Powell and Single 1996, Gandhi, Parle et al. 1997, Morgan and Oaks 1998, Krueger and Casey 2000, Mclafferty 2004). As earlier discussed, an exclusive focus on any one research method could result in misinterpretation of data, or limited insight into the subject, in this case, patients' acceptability of nurses as providers of ART and their perspectives on the proposed development and implementation of nurse-led ART clinics in Uganda. For example, a quantitative study, while revealing statistically significant associations and correlations, might fail to produce fine-grain explanatory information about the specific cause of perceptions (Pope and Mays 1993, Green and Britten 1998, Pope, van-Royen et al. 2002). Equally, a qualitative study alone would not shed light on population-level perceptions of nurse-led ART clinics.

4.6.6 Development of Patients' Focus Group Discussion Interview Guide

I developed the patients' FGD interview guide in a two-step process including reviewing relevant literature and consulting experts in the subject including my supervisor, and piloting the guide.

4.6.6.1 Literature Review and Consultation with Experts to Design the Preliminary Focus Group Interview Guide

After studying literature on patients' acceptability of healthcare providers, their perceptions on quality of care and how they define a competent healthcare worker, I produced a preliminary list of key issues to explore during the group interviews (Kingry, Tiedje et al. 1990). I critically examined the list and identified broad issues for further scrutiny. Using these broad issues, I developed an interview guide (Appendix 5) with initial topic areas and prompts for clarification and elucidation. As Kingry, Tiedje et al. (1990) have advised, I developed questions in such a way that they progressed from general to specific and from non-threatening to more threatening, to encourage participation from all members of the group from the start. I then discussed the interview guide with my supervisor and with other researchers experienced in qualitative research methodology. They suggested several improvements on the flow, structure, and content of the interview to ensure that the guide collected data of interest.

4.6.6.2 Piloting the Patients' Focus Group Discussion Interview Guide

I conducted a pilot FGD, using a convenience sample of patients attending Kiruddu Health Centre IV, which is located in Kampala. The purpose of the pilot was to test the appropriateness of the interview guide and evaluate, first, the most appropriate number of participants, second, the length of time required to obtain rich and meaningful data, and third, the inclusion of any topics originally left out, if necessary. Furthermore, the piloting gave me the opportunity to practice interviewing techniques I would employ.

With the aid of the healthcare facility manager, I approached eight patients and requested them to take part in the pilot FGD. I explained to them the purpose of the exercise, assuring them of their right to decline to participate at any point. I also informed them

that their decision not to take part in the study would not affect the services they received at the clinic in any way. I also assured them that I would maintain confidentiality at all times. All of them agreed to participate in the study and thereby signed the informed consent forms.

In general, the pilot interview provided rich descriptions of opinions about the nurse-led ART clinics and was much more successful than I had earlier anticipated. The participants were free and honest in their responses; this could have been partially because of the relaxed atmosphere created during the interview process. I covered all the topics in depth within one hour but found difficulties in facilitating a group of eight. For example, it was difficult to ensure equal contribution by each member. For this reason, I decided that six participants might minimise such difficulties of facilitation. I also found it challenging to moderate the group discussions since I was tempted to contribute to them instead of only facilitating as I was supposed to do. Nevertheless, I acknowledged my shortcomings and remained in the background except when seeking clarification of some answers.

The research assistant recorded the pilot FGD using two MP3 recorders. I summarised the interviews immediately afterwards, highlighting key emerging issues and themes. The identified issues and themes provided feedback that I used to improve the subsequent interviews. I amended a few questions in the guide after the interviews to improve the flow and structure of the interview. Specifically, the interview guide required rewording of two questions because participants had not clearly understood them and had answered them inappropriately. With no further issues arising, I adapted the guide for use in the research.

I transcribed the pilot interviews verbatim, coded, and analysed them using Framework Analysis (described in Section 4.9) with the help of the QSR NUD*IST VIVO (N-Vivo) Version 2 software. However, I did not use the findings of the pilot interviews in the final data analysis.

4.6.7 Conducting Focus Group Discussions with Patients

In this section, I describe, first, the number of FGDs conducted and the number of participants in each group, second, the FGD data collection process, third, the recording of the data arising from the FGDs, and lastly, the inclusion criteria.

4.6.7.1 Number of Focus Group Discussions and Number of Participants in each Group

I conducted nine FGDs, with each comprised of six participants. Four groups had equal numbers of men and women (n=3). Three groups had only women (n=6), while the remaining two groups had only men (n=6). I conducted two FGDs at Naguru Health Centre IV (urban doctor-led), Kangulumira Health Centre IV (rural nurse-led), and Kiswa Health Centre IV (urban nurse-led), and three FGDs at Bukulula Health Centre IV (rural doctor-led). Although I had initially planned to conduct two FGDs at each healthcare facility, I decided to conduct an extra FGD with women at Bukulula Health Centre IV as I felt that I had not been as neutral as I would have liked during the first group interview with them.

4.6.7.2 Focus Group Discussion Data Collection

With the help of the HIV clinic managers, I approached and requested six patients who had turned up for follow-up care at the clinic to take part in the FGDs. After explaining to them the aim of the study, I recruited only those who met the study inclusion criteria and who consented to take part in the study. The chosen participants were fast-tracked to receive the services they had come for at the clinic that day. I then held the FGDs at the end of their clinic visit.

Immediately before the interview, I read to them and discussed with them the patient information sheet (Appendix 2). I also encouraged them to ask questions, if they had any. This ensured that the potential participants understood the purpose of the research. Furthermore, I reassured them that I would maintain their anonymity at all times. I then requested them to participate in the study. Only those participants who agreed to do so

were requested to sign an informed consent form (Appendix 3), in which they consented to participate in the research and to be recorded on audio tape during the interview.

To maintain the flow of information, I did not follow the interview guide in a rigidly structured manner, and I covered some topics as they arose, asking questions or using comments to stimulate and focus the discussion as necessary. However, I covered all the topics on the interview guide, keeping the interviews informal to encourage natural discussion of issues. Furthermore, I encouraged the participants to discuss freely issues that came out of the survey, to understand them deeply.

On two separate occasions, two patients did not join the FGDs because they were not feeling well on those specific days and yet I considered their views critical, as one of them was a member of a minority group while the other was an HIV treatment activist. I, therefore, requested them to participate individually in the study. They agreed, and each of them signed a consent form to that effect. I made appointments convenient to them and conducted in-depth interviews with each to explore further the common issues that had become evident from the surveys.

Interview sessions lasted from 90 to 120 minutes, depending on how much information the participants presented. During and after the interviews, I would immediately transcribe and analyse the proceedings not to lose information on important issues that had come up in the discussions (McLellan, MacQueen et al. 2003).

4.6.7.3 Recording the Data arising from the Focus Group Discussions

The pilot interview had already shown me that I could not keep detailed field notes while simultaneously facilitating the interviews. Facilitation required me to follow the flow of discussions and to ask questions for clarification or explanation. Therefore, I captured the exact words used by the study participants using audio recording done by the research assistant, which helped to reduce the loss of richness and description central to qualitative designs (Taylor and Bogdan 1998). The real advantage of audio recording is

that it is a validity check, in that raw data are available for scrutiny and may serve a range of analytical interests (Polgar and Thomas 1995). It also allows events to be reviewed as often as necessary (Bottorff 1994). Although I did not experience notable challenges with recording the interviews, some researchers have reported participants refusing to speak in the presence of a recorder, or sanitising their views which might not reflect their true feelings (Polgar and Thomas 1995).

4.6.7.4 Inclusion Criteria

Patients who were 18 years and above, and had been on treatment for at least six months were eligible. The next section describes the procedure followed to conduct semi-structured interviews with nurses, doctors, policymakers, and other related key stakeholders.

4.7 Sub-Study Two: Semi-Structured Interviews with Nurses, Doctors, Policymakers, and other related Key Stakeholders

I chose a qualitative research method, specifically SSIs, to investigate the views of nurses, doctors, policymakers, members of the nursing and medical professional councils, ART trainers, and coordinators on the development and implementation of nurse-led ART clinics. Semi-structured interviews enable researchers to delve deeply into the topic of interest and are used often in policy research (Ritchie and Spencer 1994, Newton 2010). An interview guide containing questions and topics of interest is used in SSIs (Ritchie and Spencer 1994, Newton 2010). The interviewer has some discretion about the order in which questions are presented, but the questions are standardised, and probes may be used to ensure that the researcher covers the correct material (Barriball 1994). This kind of interview collects detailed information in a style that is somewhat conversational. In this section, I describe the process of conducting the SSIs, which began with the development of the interview guides before the data collection exercise.

4.7.1 Development of Nurses', Doctors', Policymakers,' and other related Key Stakeholders' Interview Guides

To develop the interview guides for nurses, doctors and other related key stakeholders, I reviewed the literature on and consulted with experts in qualitative research methodologies. Afterwards, I piloted the developed interview guide.

4.7.1.1 Review of Literature and Consultation with Experts

I developed the first drafts of SSI guides by reviewing literature and textbooks on qualitative interview techniques and methodology (Murray and Chamberlain 1999). I also held discussions with other PhD-prepared researchers experienced in the use of qualitative research methodology, including my supervisor. In particular, my supervisor provided considerable suggestions on the structure of the guide to improve the flow and on the content to ensure that the guiding questions could collect data of interest. The interview guides included broad questions to investigate nurses', doctors', policymakers' and other related key stakeholders' experience with nurses in expanded HIV clinical roles as well as the facilitators and barriers to the proposed development and implementation of nurse-led ART clinics as perceived by these participants.

4.7.1.2 Piloting the Interview Guides

I piloted the respective interview guides through interviews with three nurses, two doctors, one regional ART coordinator, and one national ART trainer identified by the AIDS Control programme manager as interested in participating in this study. The pilot interviews ensured that the different guides collected the data they were supposed to pick. I also got the opportunity to practice my interviewing techniques further while piloting the guides. Resulting from the pilot interviews, I found it necessary to add some questions that had not been included in the original guides. I also made minor changes to the structure of the questions in the guide to improve the flow of the interview. These pilot interviews lasted between 45 minutes and one hour each, which I considered satisfactory. I transcribed verbatim, coded, and analysed the data from the pilot interviews using the QSR NUD*IST VIVO (NVivo) Version 2 software. However, I did not use the data from the pilot interviews in the final analysis.

4.7.2 Data Collection from Nurses, Doctors, Policymakers and other related Key Stakeholders Using Semi-Structured Interviews

Conducting the SSIs involved contacting and recruiting prospective nurses, doctors, and other related stakeholders to participate in the interviews, as well as in collecting the data.

4.7.2.1 Contacting and Recruitment of Prospective Nurses, Doctors, other related Key Stakeholders for the Semi-Structured Interviews

To recruit nurses and doctors for the interviews, I telephoned the healthcare facility managers of ART clinics where the prospective participants worked. The purpose of the call was to explain to the managers the aim and objectives of the study, and to request them to prepare a list of names and telephone contacts of all the nurses and the doctors working in the ART clinics within their respective healthcare facilities. Armed with these lists, I made calls to each of the nurses and doctors to explain to them the purpose of the study and its aim and objectives, after which I requested each of them to participate in it. All the nurses and doctors I contacted gave verbal consent to participate in the study. I subsequently made appointments, with each of them for the interview at the clinics where they worked, noting the day and time I was supposed to meet them. In addition, I gave them a toll-free telephone to call and confirm their continued interest three days prior to the interview date. All the prospective study participants, with the exception of one nurse, called three days prior to the interview date to confirm their interest in the interview. I contacted the nurse who had not called back and she explained that she had been unable to call since she had misplaced the toll-free telephone number, but she still agreed to participate in the interview.

To recruit regional and national ART coordinators, national ART trainers, members of professional councils, and policymakers, I used the contact address directory at the MoH resource centre to obtain their telephone contact details. I telephoned each of them to introduce the study aim, objectives as well as to request each of them to take part in the study. All the participants I contacted agreed to take part in the interviews. I made an appointment for the interviews with each of them, which I noted in the study planner, including details of the appointment date, place, and time. I made telephone call

reminders three days prior to the appointment date to confirm whether they were still willing and available to take part in the study.

4.7.2.2 Data Collection from Nurses, Doctors, Policymakers and other related Key Stakeholders using Semi-Structured Interviews

Before starting the individual interviews, I read out the study information sheet (Appendix 2) to each potential participant to ensure that they were clear about the purpose of the research. I then gave them an opportunity to ask questions. I reassured them that I would maintain their anonymity at all times before requesting each of them to sign the consent form to agree to participate in the research and to be audio-recorded.

I did not follow the interview guide in a rigid structured manner but discussed the topics as they arose. This non-structured approach helped me to keep the interviews as conversational as possible and to maintain the flow of information. However, I made sure that I covered all the topics in the interview guide with all the participants, except for one nurse who had to leave before the end of the interview to attend to emergencies. I requested that nurse to reschedule her interview to another day and time, to which she agreed. Participants were encouraged to talk freely about their experiences, make suggestions and express their expectations related to the proposed introduction of the nurse-led ART clinics in Uganda.

During the interviews with the nurses, I specifically encouraged them to discuss freely their views on how the proposed nurse-led ART clinics would affect nurses' work. I also requested them to express their thoughts about how these clinics would affect their relationships with other healthcare workers, particularly the doctors and nursing colleagues in general nursing work. I also explored their thoughts concerning any changes they perceived in themselves resulting from their involvement in nurse-led ART clinics.

I recruited and interviewed four to six nurses from each of the ART clinics (Table 4.3, Section 4.6.2.1). Although, I had planned that the precise number of nurses to be

interviewed would depend on the extent to which the relevant themes would be saturated within the context of the study objectives, I anticipated that up to twenty-six nurses would be interviewed. Indeed, I achieved saturation with the eighteenth interview but decided to continue with the interviews to get nurses' varied perspectives on the themes that had already become visible in the earlier interviews with their colleagues, until I had interviewed all the originally identified twenty-six nurses. Furthermore, to get variation of views on the proposed nurse-led ART clinics from participants with different experiences, I drew thirteen nurse-participants from ART clinics predominantly run by nurses (nurse-led ART clinics), while I drew the remaining thirteen nurse-participants from ART clinics predominantly run by doctors (doctor-led ART clinics).

During the interviews with the doctors, I specifically explored their views on the proposed nurse-led ART clinics and what ART-related tasks they felt nurses were able to safely deliver to PLHIV. I also explored their willingness to support nurses in expanded HIV clinical roles, as well as what they perceived to be facilitators or barriers to the development and implementation of these clinics. Also, from each ART clinic (Table 4.3, Section 4.6.2.1), I interviewed one-to-two doctors wherever they were available, and ended up interviewing ten doctors in total.

I conducted all the interviews with nurses and doctors in the meeting rooms of their respective healthcare facilities, where these existed, or under tree shades. The interviews with doctors and nurses lasted from 45-90 minutes depending on how detailed the respective interviewee was.

The interviews with regional and national level key stakeholders who included three policymakers from the MoH, two regional ART coordinators, three national ART trainers, three members from the Medical Professional Council, and three members from the Nursing Professional Council, took place at their places of work, either in their offices or meeting rooms. In the interviews with these stakeholders, I specifically explored their views on, attitudes towards, as well as their willingness to support the proposed nurse-led ART clinics, and whether they thought that nurses were up to the task of providing ART. I also asked them to give their views on what support they thought

was required to enable nurses to provide this care. I conducted all the interviews at a time most convenient to each participant as had been agreed with them. Most of these interviews lasted from 60-90 minutes. The research assistant audio-recorded and took notes of the proceedings of the discussions.

I transcribed all the interviews during the data collection phase and conducted preliminary analyses, which informed revisions of the interview guide. In this way, I adjusted my study plan according to the study findings as the research progressed (Crabtree and Miller 1999, Pope, Ziebland et al. 2000).

4.8 Framework Analysis for the Qualitative Data

Once I started collecting the qualitative data, I began systematically analysing it using the 'framework analysis for qualitative data' suggested by Ritchie and Spencer (1994). I chose the framework analysis approach because of its salient features as described by (Rabiee 2004). The framework analysis is an excellent tool to assess policies and procedures from the very people that they affect as it ensures that policies reflect their needs and wants, thus translating into a greater level of compliance (Rabiee 2004). Being grounded and generative, the framework analysis approach allowed me to generate data from the original accounts and observations of the study participants. Being flexible and dynamic, it allowed me to begin the analysis process during the data collection stage, and to make changes to the interview guide as the data collection exercise progressed. Being systematic, it enabled me to treat all similar units of analysis methodologically. Being comprehensive, it enabled me to have a full review of all the material collected. Being accessible to others it enabled me to present the analytical process and the interpretations derived from it to be viewed and judged by people other than myself as the primary analyst. Due to its ability to allow easy retrieval of the original textual material, it enabled me to access the original textual material during and after the analysis process. Due to its ability to allow within-case and between-case analyses, it enabled me to make comparisons between and associations within the different stakeholders' views. These features helped me make sense of all the qualitative data that emerged from the interviews (Rabiee 2004), making it easy for me to generate recommendations about the proposed development and implementation of nurse-led ART clinics. The steps in framework analysis are discussed next.

4.8.1 Steps in Framework Analysis

To analyse the qualitative data, I employed the five steps of framework analysis as described by Ritchie and Spencer (1994) and Pope, Ziebland et al. (2000). These steps include familiarisation, identifying a thematic framework, indexing, charting, and mapping and interpretation.

During the familiarisation step, I listened to the audiotapes, and studied and read the field notes several times to familiarise myself with the data collected. I also transcribed all the data verbatim. In so doing, I gained an overview of the collected data (Ritchie and Spencer 1994, Pope, Ziebland et al. 2000), and throughout this process, I began to notice and note down emerging key issues, ideas, and recurrent themes.

The step of identifying a thematic framework occurred after familiarisation when I recognised emerging themes in the data set. Some of the emerging themes from the data were similar to the *a priori* themes that had emerged from the review of the literature. However, I deliberately let the data guide me to identify themes by taking note of additional themes as they came out of the data using the notes taken during the familiarisation stage (Ritchie and Spencer 1994). The key issues, concepts, and themes expressed by the participants formed the basis of the thematic framework used to filter and classify the data. I judged the meaning, relevance and importance of the issues, and started making implicit connections between ideas. I made sure I addressed all the original research questions during analysis, just as I did during the data collection.

During the indexing step, I identified sections of the data that corresponded to a particular theme. I applied this process to all the textual data that was gathered (transcripts of interviews). I used a numerical system to index references which I annotated in the margin beside the text for the sake of convenience (Ritchie and Spencer 1994). I employed the constant comparative method, a commonly used analytic approach (Glaser and Strauss 1967, Miles and Huberman 1994, Strauss and Corbin 1998). I reviewed the data in detail, line by line, and as a particular concept became apparent, I assigned a code to that segment of the document. These codes acted as tags (Miles and

Huberman 1994) that helped me to catalogue the key concepts while preserving the context in which these concepts occurred. To ascertain whether a code had been assigned appropriately, I compared text segments with text segments to which I had assigned the same code previously to ascertain whether they reflected the same concept. Using this constant comparative method, I was able to refine dimensions of existing codes and to identify new codes. Through this process, the code structure evolved inductively, in accordance with analytic principles of grounded theory (Glaser and Strauss 1967, Strauss and Corbin 1998).

During the charting step, I arranged the specific pieces of data indexed in the previous stage in charts of the themes identified earlier. I lifted the data from its original textual context and placed it in charts consisting of headings and sub-headings drawn during the thematic framework. As already described above, these headings and sub-headings included themes from *a priori* literature review as well as themes that emerged from the interviews. The charting was guided by the preliminary conceptual framework which was developed to answer the research objectives and questions, and was done in a way that I perceived would make it easy to report the research findings (Ritchie and Spencer 1994). I made sure that the data was still clearly identified by the participant it came from, even though it had been lifted from its original context. For clarity, I kept the data from each participant in the same order in each chart (Ritchie and Spencer 1994).

During the mapping and interpretation step, I analysed the key characteristics of the themes as laid out in the charts. I developed a schematic diagram of the phenomenon, which guided me in the interpretation of the data set. At this point, I was cognisant of the objectives of qualitative analysis, which were defining concepts, mapping range and nature of phenomena, creating typologies, finding associations, providing explanations, and developing strategies (Ritchie and Spencer 1994). Once again, these concepts, phenomena, and associations reflected the participants' perspectives. Therefore, any strategy or recommendations that I make will echo the true perspectives, attitudes, beliefs, and values of the participants.

4.9 Computer-Assisted Qualitative Data Analysis Software

The importance of conducting a systematic and rigorous analysis of qualitative data has generated increasing interest in computer-assisted qualitative data analysis software (Kelle, Prein et al. 1995, Pope, Ziebland et al. 2000). Qualitative data collection generates a substantial amount of data (Ragin, Nagel et al. 2004). For instance, a one-hour in-depth interview may generate up to 12 single-spaced pages of transcripts. With this vast amount of data, researchers nowadays often use computer software to facilitate qualitative data analysis through computerised coding, organisation, searching, and retrieval of the data. Given the large volume of data the interviews generated, I used the NVivo software program to help organise and retrieve data. The software enabled me to be more consistent and generate reproducible analysis, and to have access to analytic methods not available by hand (MacMillan and Koenig 2004). While using the software, I took all the necessary steps described above in Section 4.7 to ensure a systematic and rigorous analysis and synthesis of the data.

4.10 Sub-Study Three: Measuring Nurses' and Doctors' Competencies in HIV Care

To measure the nurses' and doctors' competencies in managing HIV-related disease conditions, I used the HIV clinical vignettes. To this end, I took three major steps including constructing the HIV clinical vignette tests, administering the vignette tests, and analysing the scores. These steps are described in this section, starting with constructing the vignette tests.

4.10.1 Constructing the HIV Clinical Vignettes

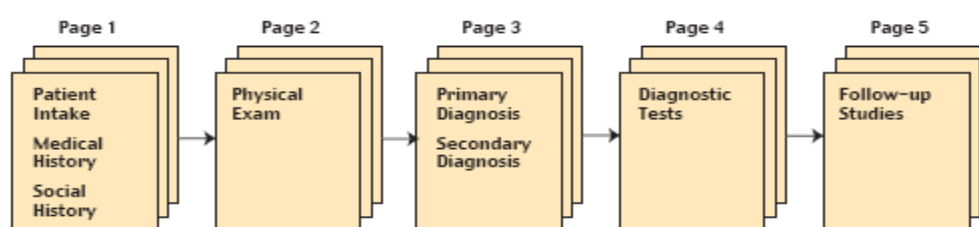
To construct the HIV clinical vignettes, I followed a three-step process including developing the HIV clinical vignettes, developing the scoring criteria, and piloting the vignettes.

4.10.1.1 Developing the HIV Clinical Vignettes

I developed eight paper-based written HIV clinical vignettes to assess nurses' and doctors' competencies in HIV care. These vignettes were developed with the help of the Uganda Antiretroviral Treatment Guidelines and Protocols. Clinical vignettes are validated competence measurement tools (Peabody, Luck et al. 2004). Their major

advantage arises from their ability to control for case-mix variation, thereby accounting for variations in individual health status that would otherwise confound survey studies (Peabody, Luck et al. 2004). Each vignette represents a simple and a complex version of Tuberculosis Disease in HIV, Herpes Zoster in HIV, HIV in Pregnancy, and Cryptococcal Infection in HIV (Appendix 9). As illustrated in Figure 4.4, I constructed each vignette with five logical sections representing the different domains of clinical care including history taking, physical examination, radiological and laboratory tests, diagnosis, and treatment plan. Each of the five domains forms a “page” depicting a phase of a typical outpatient HIV care encounter between a healthcare worker and a patient.

Figure 4-4: A Model of a Typical Paper-Based Clinical Vignette



I designed the vignettes to prompt open-ended responses to questions arranged in sections to re-create the sequence of a typical ART client visit, with each section beginning with the presentation of new patient information gained from answers to questions in the previous section. After answering one section and moving on to the next, the nurse or doctor taking the vignette test would not be able to return to a previous section to revise answers. Thus, they would not use the new information to change (and improve) their previous answers.

I organised a two-day working meeting with a panel of eight local Ugandan experts in HIV care, including four doctors and four nurses, to refine the vignettes further, thereby enhancing their content validity. The local panel of experts included four doctors and four nurses who had worked in HIV care and ART for more than five years. These experts helped to ensure that the vignettes were comprehensive in assessing the key competencies, coherent, and sensible.

4.10.1.2 Development of the Scoring Criteria for the HIV Clinical Vignettes

I conceptualised high-quality clinical practice as the comprehensive provision of services for a given clinical case that leads to better patient outcomes. I determined what a healthcare worker would have to do during a patient visit to treat a clinical disease condition in a manner consistent with Ugandan Standard Practice Protocols, which involved describing a comprehensive set of actions that the healthcare worker needs to undertake. Scoring, therefore, did not rely on single-point measures such as determining if an antibiotic was prescribed, or if the patient was screened for the history of co-morbidities. Instead, I used comprehensive measures that captured whether the healthcare worker elicited the entire relevant history, determined the relevant physical examination items, ordered the necessary laboratory or imaging tests, made the correct diagnosis including aetiology, and prescribed a complete treatment (management) plan. Initially, I identified the candidate evidence-based criteria for each of the eight HIV-related disease conditions from the Uganda ART treatment protocols. I then submitted all candidate criteria to a local expert panel with more than five years experience in the management of the eight disease conditions. These experts reviewed and refined the answers for each vignette. I finalised the scoring criteria list based on the recommendations from the local expert panel.

I also allocated scores to possible responses to each vignette in the Access database, starting by determining if a procedure was “done” or “not done”. Procedures not done were scored zero. Those done were designated so and scored appropriately. If a procedure was necessary and the evidence indicated that it was required for that clinical scenario, it was scored 1. If it was preventive and necessary for a particular condition, it was scored 0.8. Lastly, if it was unnecessary and evidence indicated it should not be done for that clinical scenario, it was scored 0.

4.10.1.3 Piloting the Vignettes

I pre-tested the vignettes with eight participants including four nurses and four doctors from the HIV clinic at the National Referral Hospital, Mulago, located in the Uganda capital, Kampala. I gave each participant eight vignettes to complete, one after another over a period of four hours, with a thirty-minute break in-between four vignette tests. I presented the vignettes to each participant in a random order reflecting the way patients

present themselves to healthcare providers at the clinic. Since these participants did not find challenges in answering the vignettes, I did not make any major changes to them. Each vignette test took approximately twenty-to-thirty minutes for a participant to complete, which is comparable to the length of an HIV care clinic visit.

4.10.2 Data Collection of Nurses' and Doctors' Competencies in HIV Care using HIV Clinical Vignettes

In this section, I describe the sample size calculation of the nurses and doctors for the vignette tests, the inclusion criteria for nurses and doctors who undertook the vignette tests, and the process of administering the vignettes.

4.10.2.1 Sample Size Calculation of Nurses and Doctors for the Vignette Tests

I calculated the sample size to detect differences in nurses' and doctors' competencies in managing these disease conditions based on a number of assumptions derived from the data from the MoH supervision reports. From these reports, the mean scores of doctors and nurses in managing diseases among HIV positive patients within their respective groups are normally distributed. The average score for doctors in managing those diseases according to national standards is 90 percent while that for nurses is 70 percent with a standard deviation of 0.38 between the two groups (MOH 2008a). Therefore, the minimum expected difference in doctors' and nurses' mean scores in managing common HIV-related conditions according to national standards is 20 percent (90% - 70%). I used the doctor and nurse ratio of 1 to 2, since doctors are fewer than nurses in the study area. Due to the limitation in the number of doctors involved in HIV care, time, and logistics, I decided to power the study at 80 percent, and I chose 0.05 as the Type I error. Using that information, I calculated the sample size of nurses and doctors to detect differences in their competencies in managing HIV-related disease conditions with the "Power and Sample Size Calculation Program" used for continuous variable of two independent professional groups found at <http://biostat.mc.vanderbilt.edu/PowerSampleSize> (Dupont and Plumber 1990). Using this program, I determined the sample size of 86 nurses and 43 doctors as appropriate to test the null hypothesis. However, I eventually recruited 90 nurses and 45 doctors, to take part in the evaluation, due to the interest the participants showed to be involved in this study.

4.10.2.2 Inclusion Criteria for Nurses and Doctors to undertake the Vignette Tests

Two considerations were used for nurses and doctors to take the vignette tests:

1. The nurse or doctor must have been working in the HIV clinics and involved in the management of HIV-related disease conditions at the time of the interview
2. The nurse or doctor must have undertaken training in HIV management, particularly the Ministry of Health's Integrated Management of Adolescent and Adulthood Illness training.

4.10.2.3 Administering the Vignette Tests

I purposively selected and recruited nurses and doctors who met the inclusion criteria and were at the time of the interviews working in the Central and East-Central regions of Uganda. I worked in close collaboration with the MoH officials and the district health management team to contact the prospective nurse- and doctor-participants. I administered the vignettes to 135 participants (90 nurses and 45 doctors), through twenty-six workshops held in the district health office boardrooms. Each workshop comprised five to six nurses and doctors. After obtaining informed consent from each nurse or doctor, I presented the written vignettes to each of them. Just like in the pilot, I presented the vignettes to them in random order. I presented the same set of cases to each participant, thus eliminating the need for case-mix adjustment. After completing the history section, I gave a summary of the patient's history to each of the participants, asking them to describe the physical examination steps appropriate for the case. Upon completion of this section, I presented the physical examination findings, and the participant proceeded through similar phases to order tests or imaging, make a diagnosis, and prescribe treatments or referrals. Participants could not return to modify answers in a previous section because each answer sheet was immediately removed from them once they had completed it. The completed answers to all sections comprised a vignette response. Each nurse or doctor completed all eight vignettes over a four-hour period, with a 30-minute break in between a set of four vignette tests.

4.10.3 Data Management of the Scores in the HIV Clinical Vignettes

Data management involved two steps including scoring the vignettes and analysis of the scores.

4.10.3.1 Scoring the Vignettes

I used the scoring criteria developed earlier to assign scores for nurse- or doctor-vignette combinations. I assigned different weights (Norman, Neufeld et al. 1985, Peabody, Rahman et al. 1994) as earlier described. I scored each participating nurse or doctor separately on each vignette. I used the scoring forms (Appendix 10) to help assign the scores. I aggregated the individual item scores into domain scores including history taking, physical examination, ordering of tests, diagnosis, and treatment, totalled all the domain scores and divided them by the total possible score, to generate a percentage correct score for each of the nurse-vignette or doctor-vignette combination. To calibrate the scoring process, one senior doctor and I independently scored a sample of 10 randomly selected vignette responses and we compared the scores for consistency.

4.10.3.2 Analysis of the Scores in the HIV Clinical Vignettes

I crosschecked all the written vignette answer sheets daily to ensure completeness before they were double-entered and cleaned using the Epidata software. The Epidata software was used to generate and clean range and inconsistency errors. I conducted all the analyses using the R-software, considering a p-value of less or equal to 0.05 to be statistically significant. I computed the mean scores for doctors and nurses across each of the eight HIV clinical vignettes, and for the four aggregated simple HIV clinical vignettes, the four aggregated complex HIV clinical vignettes, and all the eight aggregated HIV clinical vignettes. I hypothesised that there was no difference in the mean scores of doctors and nurses in each of the eight individual HIV clinical vignettes, as well as in their average scores for four simple, four complex, and eight HIV clinical vignettes aggregated. Using the Shapiro-Wilk test to assess normality of the scores, I was able to check for appropriateness of using the ANOVA model to detect statistically significant differences between doctors' and nurses' performance. I used the Brown-Forsythe method to test for homogeneity of the error variances, owing to its robustness to departures from normality and its being suited for unequal sample sizes across groups. There was normality of the averaged scores for the simple HIV clinical vignettes one, two, and four, which enabled me to conduct the two-way ANOVA test. However, the error variances were found not to be homogeneous for average scores in vignette three as well as for all the complex vignette versions, and for all the three aggregated vignette categories, which prompted me to apply a square transformation on the average scores to achieve approximate normality and constant variance. The transformations made it

possible to use one-way ANOVA to assess the significance of the differences in the mean scores between doctors and nurses.

I also used the average scores in the five clinical domains of care (history taking, physical examination, test ordering, diagnosis, and treatment) for each nurse-vignette and doctor-vignette combination for the sub-analysis. However, owing to the highly skewed nature of scores in the domains, possible transformations did not yield constant variance and approximate normality. I, therefore, used the Kruskal-Wallis test to evaluate significant differences between nurses' and doctors' mean rank scores. Lastly, to analyse the effect of number of years of experience in HIV care on nurses' and doctors' performance scores in the vignettes, I used Tukey's method to perform all the pairwise mean comparisons to identify where the actual differences existed in the presence of significant interactions. In the next section, I discuss the measures I undertook to ensure trustworthiness of the results of this particular study.

4.11 Establishing Trustworthiness

Although I have already discussed the measures I undertook to ensure trustworthiness of the results of this study throughout the discussion of the different research methods, I discuss further in this section some special considerations used to ensure trustworthiness of the qualitative and quantitative data. Establishing trustworthiness of any research endeavour is crucial throughout the research process to determine the quality (Fossey, Harvey et al. 2001). Trustworthiness of research is important to ensure that the evidence from the results reported in the study is sound and that the arguments based on the results are strong (Lincoln and Guba 1985). The measures I undertook to ensure that results of the qualitative studies represent the participants' views other than my own views are discussed next.

4.11.1 Establishing Trustworthiness for the Qualitative Research Study

I employed the Lincoln and Guba (1985) framework to establish confidence in the qualitative study findings. The use of this framework ensured that the participants' views, and not my own biases, determined the findings. Lincoln and Guba (1985)

provide a model that is influential in formalising trustworthiness while conducting qualitative research, which is certainly very helpful for a novice qualitative researcher like me. The Lincoln and Guba (1985) model is a refined version of the Guba (1981) model, and it is based on the identification of four aspects of trustworthiness for evaluation of qualitative research, namely: credibility, transferability, dependability, and confirmability. These aspects are linked to the conventional terms of internal validity, external validity, reliability, and objectivity as used in quantitative research.

The Lincoln and Guba (1985) criteria for establishing trustworthiness of qualitative research is discussed briefly. Credibility (in preference to internal validity) is the confidence in the 'truth' of the findings. The investigator attempts to ensure that a true picture of the phenomenon under scrutiny is represented. Transferability (in preference to external validity/generalisability) shows that the findings of the study have applicability in other contexts. The researcher should provide sufficient detail of the context of the fieldwork for a reader to be able to decide whether the prevailing environment is similar to another situation with which he or she is familiar and whether the findings can justifiably be applied to the other setting. Even though each situation in qualitative research is defined as unique and thus not amenable to generalisation, the aim of transferability is to give others enough information to judge the applicability of the findings to other settings. Dependability (in preference to reliability) shows that the findings are consistent, and when repeated, the same results arise. Researchers should strive to enable a future investigator to repeat the study. Variability is expected in qualitative research. Thus, Lincoln and Guba's (1985) concept of dependability implies explainable sources of variability that could be provided for external review. Confirmability (in preference to objectivity) is a degree of neutrality or the extent to which the findings of a study are shaped by the participants and not by researcher bias, motivation, or interest (Lincoln and Guba 1985). Researchers must take steps to ensure that findings emerge from the data and not from their own predispositions. In referring to these criteria, I selected the following techniques for establishing trustworthiness that I thought were relevant to my research.

4.11.1.1 Credibility

To establish credibility, I interviewed different groups of participants, and even within the same group, individuals with different characteristics, to represent the multiple realities and a range of field experiences. Participants in the study were recruited because of their lived experience and their knowledge of nurse-led ART clinics' developments, as well as their varied positions in the health system structure. To triangulate the results, I drew participants, including patients, nurses and doctors, from diverse clinical settings (nurse-led versus doctor-led ART clinics, rural versus urban, and hospital versus health centre), and who had varied lengths of experience. I also collected data at different points in time and from participants with different viewpoints. Creswell (1998) and Angen (2000) have defined triangulation as using multiple data sources in an investigation to produce understanding. Although some researchers see triangulation as a method for corroborating findings and as a test for validity, this thinking remains controversial as it assumes that a weakness in one method will be compensated by the strength in another method (Creswell 1998, Patton 1999, Angen 2000, Patton 2001). It also assumes that it is always possible to make sense between different accounts, which is not likely to be the case.

Rather than seeing triangulation as a method for validation or verification, I used this technique to ensure that accounts were rich, robust, comprehensive, and well developed (Creswell 1998, Patton 1999, Angen 2000). Since a single method can never adequately shed light on a phenomenon, using multiple methods can help facilitate deeper understanding (Denzin 1978, Creswell 1998, Patton 1999). Therefore, to understand fully patients' views on nurse-led ART clinics, I used both qualitative and quantitative data in the study. This enabled me to elucidate the complementary aspects of the same phenomenon, and the points where these data diverged were of great interest to me as they provided the most insights. This is what Lincoln and Guba (1985) referred to as methods triangulation which help in checking out the consistency of findings generated by different data collection methods. I also used triangulation of sources to examine the consistency of different data sources within the same method (Patton 1999, Mays and Pope 2000, Patton 2001). For example, I collected data from documents, interviews, and participant observation to ensure that the account was robust, comprehensive, and well developed.

Although data collection focused on interviews and limited participant observation, my presence in the field lasted for over three years, thus adding credibility to my knowledge of the context of the research. I was also aware that my *a priori* expertise in HIV care as a medical doctor might have influenced the way in which I approached and interpreted the data sources. I discussed with senior nurse tutors at the teaching hospital unfamiliar issues arising from the data analysis to gain deeper understanding of nurses' perspectives. For example, as a medical doctor, stepping up to make independent decisions associated with patient care seemed obvious to me and in my view was vital for patient management. However, this characteristic did not clearly emerge as important for patient management from the nurse-participants who had taken up expanded HIV clinical roles. The nurse tutors clarified that stepping forth, speaking up, and stating your thoughts were not highly valued behaviours among nurses in Uganda, thus the manner in which participants interpreted characteristics of the nurses in expanded HIV clinical roles would vary from that of the medical context. I feel that this insight improved my approach to data analysis when attempting to describe important nurse characteristics, although I cannot say that my bias was done away with totally. To counter this bias and include a more cautious interpretation of the results, my supervisor reviewed the study findings and I discussed implementation issues with colleagues in Uganda. I held conversations with all individuals who were either sceptical of or unfamiliar with the 'nurse-led' concept. These consultations led to many dynamic conversations and assisted me in my interpretation of the findings.

4.11.1.2 Transferability

I have described the research process, the phenomenon, and the study participants under investigation in sufficient detail to help other researchers evaluate the extent to which the conclusions I draw from results of this study are transferable to other times, settings, situations, and people. This is what Lincoln and Guba (1985) referred to as thick description, a way of achieving a type of external validity. Thick description refers to the detailed account of field experiences in which the researcher makes explicit the patterns of cultural and social relationships and puts them in context (Holloway 1997).

4.11.1.3 Dependability

To enhance dependability, my supervisor and another PhD-prepared researcher not involved in the research process, examined both the process and product of the research study to evaluate their accuracy and to appraise whether or not the findings, interpretations, and conclusions were supported by the data (Merriam 1988, Creswell 1998). This is what Lincoln referred to as external audits conducted to foster the accuracy or validity of a research study. External audits provide an opportunity for an outsider to challenge the process and findings of a research study (Lincoln and Guba 1985). This process provided me with an opportunity to summarise preliminary findings, assess the adequacy of data and preliminary results, and receive important feedback that led me to collect additional data in some areas of the study.

However, external auditing also has some drawbacks such as its reliance on the assumption that there is a fixed truth or reality that can be accounted for by a researcher and confirmed by an outside auditor. This contradicts the interpretive perspective that understanding is co-created, and there is no objective truth or reality to which the results of a study can be compared (Lincoln and Guba 1985, Miles and Huberman 1994). Thus, this process may lead to confusion rather than confirmation. Furthermore, an external auditor cannot know the data more than the researcher who is immersed in the study and may not share the same point of view (Lincoln and Guba 1985). An external auditor may disagree with researchers' interpretations, and then the question of whose interpretation should stand becomes an issue (Merriam 1988). Interpretations of external auditors may lead to different understandings of the data causing problems in managing these different ways of seeing a phenomenon.

I provided a copy of interview transcripts and field notes to sixty-eight percent of the participants, and I encouraged them to agree or disagree with my findings, to enhance dependability and confirmability. I offered them options of providing comments to my records. For the remaining thirty-two percent, I presented to them a summary of the interview and requested for their feedback to find out if what I had summarised reflected what they had reported in the interview.

4.11.1.4 Confirmability

To establish confirmability, I have provided a transparent description of the research steps taken from the start of the research project to the development and reporting of findings. This is what has been referred to as an audit trail (Halpern 1983, Lincoln and Guba 1985, Schwandt and Halpern 1988). The importance of creating and reporting one's audit trail is that it gives a clear description of the research path. I developed a clear description of the research path including the research design, data collection methods and decisions, the steps taken to manage, analyse, and report data. This research path provides information about sampling, clarifies the role of the different research team members as well as the role of the different data sources. I have also reported on the rationale for the decisions taken during the research. In addition, I have provided sufficient explanation on the principles and choices underlying pattern recognition and category foundation during the data analysis, starting with the *a priori* issues in the preliminary conceptual framework that guided this study (Malterud 2001). Furthermore, I developed interview guides to direct individual as well as group discussions and to stimulate conversation about a specific issue at hand, as well as to ensure that all the desired information is sought (Dilorio, Hockenberry-Eaton et al. 1994). These guides helped to enhance the research trustworthiness by ensuring that the emic perspectives of the participants and not mine were explored and presented.

To establish confirmability further, I fostered reflexivity by working very closely with my supervisor to promote dialogue, to enhance the development of complementary as well as a divergent understanding of the study situation, and provide a context in which my beliefs, values, perspectives, and assumptions could be revealed and contested. However, it is worth noting that the idea of involving multiple investigators in a study and fostering a reflexive dialogue is most often not to reach consensus and foster reliability, but to enhance the researcher's self-awareness of his or her *a priori* conceptions. I also developed a reflexive diary where I made regular entries during the research process. I made a record of all the methodological decisions I took, the logistics of the study, and reflection upon what was happening about my own values and interests. This diary was very private and energising for me.

4.11.2 Ensuring Validity and Reliability for the Quantitative Research Study

Although I have already described all the measures I undertook throughout the study process to ensure that the results of the quantitative study are valid and reliable, in this section, I will only highlight the key measures I carried out to ensure that the patient survey and HIV clinical vignette tests measured what they were meant to.

4.11.2.1 Validity

Validity refers to whether a questionnaire determines what it alleges to (Bryman and Cramer 1997). There are two major types of validity, content and face validity. Content validity of an instrument is a measure of whether an instrument represents the factors under study (Brink and Wood 2001, Burns and Grove 2003, De-Vos, Strydom et al. 2005). Content validity refers to expert opinion of whether the scale items represent the proposed domains or concepts the questionnaire intends to measure (Polgar and Thomas 1995, Bowling 1997, Bryman and Cramer 1997). Face validity, a subtype of content validity, is not a technical validation, but merely establishes whether the tool ‘appears’ to measure the variables in the content (Brink and Wood 2001, De-Vos, Strydom et al. 2005).

In the current study, my supervisor, two other experts in the specific study field, and ten HIV local experts (5 nurses and 5 doctors) were called upon to judge whether the instruments including the vignettes reflected the known content area (Brink and Wood 2001, Burns and Grove 2003, De-Vos, Strydom et al. 2005). My supervisor, in particular, gave much input during the early stages of patient questionnaire development and during the pilot-testing stage in the field to enhance content validity.

As already discussed throughout this chapter, the patient survey questionnaire and the HIV clinical vignettes were piloted before their final use. The pilot studies helped me to improve the validity of the data collection tools and data collection procedures, to test the suitability of my sampling frame, to determine the number of codes per question, to make the necessary changes prior to the study, and to estimate the amount of time for the interviews and completing the vignette tests (De-Vos, Strydom et al. 2005). Pilot studies

are smaller versions of proposed studies conducted on few people having characteristics similar to those of the target participants to enable the researcher to refine the methodology and test the feasibility of conducting the bigger study (Burns and Grove 2003). Pilot studies help to identify possible problems in the proposed study, thus allowing the researcher to revise the methods and instruments before the actual study, to improve the success and effectiveness of the study (Varkevisser, Pathmanathan et al. 1991, De-Vos, Strydom et al. 2005). Pilot studies also offer an opportunity for assessing the suitability of the interview schedule or questionnaire; testing and adapting the measuring instruments such as assessment scales, standard scales for sufficiency, validity and reliability (De-Vos, Strydom et al. 2005). After proposing some changes, there was consensus amongst the participants that the instrument was presumed valid for the study (De-Vos, Strydom et al. 2005).

4.11.2.2 Reliability

Reliability indicates the repeatability, stability, or internal consistency of the questionnaire (Norland-Tilburg 1990, Jack and Clarke 1998). I used SPSS to calculate the Cronbach's alpha, a statistic calculated from the pairwise correlations between items to measure and subsequently enhance the internal consistency of the patient survey questionnaire. Internal consistency is a measure of correlations between different items on the same test or the same subscale on a larger test. In other words, it establishes whether different items that aim at measuring a particular construct produce similar scores. For example, if a participant expressed agreement with the statements "I like to receive ART from nurses" and "I have enjoyed receiving ART from nurses in the past", and disagreement with the statement "I hate nurses as providers of ART", this would be indicative of good internal consistency of the test.

Internal consistency ranges between negative infinity and one. Coefficient alpha is negative whenever there is greater within-subject variability than between-subject variability (Knapp 1991). Usually, the internal consistency of questionnaire items is acceptable when the Cronbach's alpha value is ≥ 0.7 (George and Mallery 2003, Peters 2014). Although the goal in designing a reliable instrument is for scores on similar items to be related (internally consistent), each of them should also contribute some unique information (Streiner 2003). Thus, very high reliabilities, of 0.95 or higher, are not

necessarily desirable, as this indicates that the items may be entirely redundant (Streiner 2003). Cronbach's Alpha is higher for tests measuring narrower constructs, and lower when more generic, broad constructs are measured. To increase the trustworthiness of the results of this study, I also employed strategies to relax participants before and during the interviews. These strategies are discussed in the next section.

4.12 Creating a Conducive Environment Before, During, and After the Interviews

As advised by Basch (1987), my role as a moderator was to create a non-hostile encouraging environment that gave confidence to all study participants to share their views. For example, I avoided interfering too abruptly with participants' conversations during the interviews by carefully interposing probing remarks, in-between questions, and summaries during facilitation of the process. Millward (1995), also recommends that the moderator should be a person who is directly involved in the project because he or she will be sensitive to the issues and the need for methodological rigour, even if their group management skills are not specially refined. However, Carey (1994) states that the researcher is not always the best person to act as moderator because they may not have the necessary skills. Aware of those possible disadvantages I could face as a moderator, I conducted pilot and mock interviews with friends to acquire group management skills, which helped to mitigate my deficiencies with each interview. Before commencing with the interviews, the participants and I developed ground rules as advised by Krueger (1994). I explained this process to the study participants by writing on the flip chart and by reading out the rules to them. They agreed to speak individually and not to speak over each other. They also set a time limit of one and a half hours for the discussion. I explained to them my role as a moderator, which was to ask the questions and seek elaboration while staying as neutral as possible (Reiskin 1992). I encouraged them to express their thoughts and feelings, assuring them that they would not face repercussions relating to any contentious issues that would come up. I gave them the opportunity to ask any questions before commencing the interview.

Furthermore, I, as a male, deliberately chose a female research assistant because in qualitative research, it is desirable to match the gender of researchers to the gender of study participants to increase the comfort level of the participants when discussing potentially sensitive issues (Redman-MacLaren, Api et al. 2014). However, I did not

observe marked differences in the discussions of men and women during the data collection stage. Furthermore, I chose the healthcare facility or office environment to hold the interviews because they were a familiar and neutral environment for the study participants. Dilorio, Hockenberry-Eaton et al. (1994) and White and Thomson (1995) have advised that a conducive and familiar setting is essential in enhancing participation by all members. Aimed at further improving a relaxing atmosphere during the interviews (McDaniel and Bach 1996), the participants received some refreshments such as tea, soft drinks, cakes, and biscuits.

4.13 Ethical Considerations

I submitted the study protocols to the Ethical Committee of the London School of Hygiene and Tropical Medicine and to the Ugandan MoH for review and approval before commencing with the study. I considered several ethical issues while designing the study protocol. I developed an information sheet (Appendix 2) and an informed consent statement (Appendices 3 and 4) detailing the purpose, nature of the research, and the procedures for the interview.

I would read out the information sheet and the consent statement to the prospective participants before commencing with the interviews. I would inform them about the potential benefits of this study, which included an opportunity for them to verbalise their views on a proposed new type of ART delivery model that could help shape policy formulation for the benefit of all. I would also inform them about the potential risks of participating in this study, which included loss of privacy and time, emotional discomfort caused by some sensitive topics covered by the study, and non-payment to the participants after the interviews.

I mitigated these risks by assuring the participants that they could decline to answer any questions that made them uncomfortable and that they would withdraw their participation at any point during the interview. I informed them of the confidentiality of the information obtained during this study. I also informed them that all the data would be anonymous, as I would not use the participants' names during and after the interviews. I also informed them that I would change all references to specific healthcare

facilities. I further let them know that I would lock up the interview papers in a filing cabinet, and I would safely store the electronic data in password-protected computer files for ten years after which I would shred the interview papers and delete the data from the computer as necessary.

Finally, on the issue of compensating the participants for the time spent taking part in the study, I followed the policy of the MoH in Uganda that prohibits offering monetary payment to study participants. However, I sought for and received special permission from the ministry to give a soft drink and a cake to each participant during the interview since the interviews were to take place after some of the participants had been waiting in line for a long time to see the healthcare provider. Furthermore, I was granted permission to provide each participant with transport facilitation, equivalent to three British pounds, at the end of the interviews because they were delayed by the activity. The study setting is presented in the next chapter.

5 Study Setting

5.1 Introduction

This chapter provides background information on Uganda, its public health system, and task shifting in Uganda. I chose Uganda as a case study for this research mainly because it has a high prevalence of HIV with few doctors to provide ART for those in need of it. Moreover, the country has been at the forefront in the fight against HIV with considerable success, yet for the past decade, it has struggled to introduce nurse-led ART clinics with little success.

5.2 Background Information on Uganda

Uganda is a land-locked country in Eastern Africa bordered by Kenya to the east, the Democratic Republic of Congo to the west, the Republic of South Sudan to the north, and Tanzania and Rwanda to the south (Figure 5.1). It is comprised of 112 districts across eight administrative regions including Central, East-central, Eastern, North-central, North-east, West-Nile, South-west, and Western. This study was conducted in Central and East-central regions, the biggest two regions, comprised of 33 districts with 40 percent of the population of the country (UBOS 2015) - Figure 5.1.

Figure 5-1: Map of Uganda Showing the Regions and Study Area



Uganda has a disease burden typical of many developing countries. Diseases related to poverty such as malnutrition and diarrhoea are common, while chronic diseases such as diabetes and hypertension are on the rise (MOH 2015). Although the national adult HIV prevalence declined significantly from 30 percent in the early 1990s, it remains quite high — currently estimated at 7.3 percent (MoH 2016) — and HIV-related illnesses remain among the most common causes of death in all age groups (UBOS 2015). The HIV epidemic in Uganda is generalised (UNAIDS 2014, MoH 2016). Uganda’s key national demographic and HIV epidemiological data are summarised in Table 5.1.

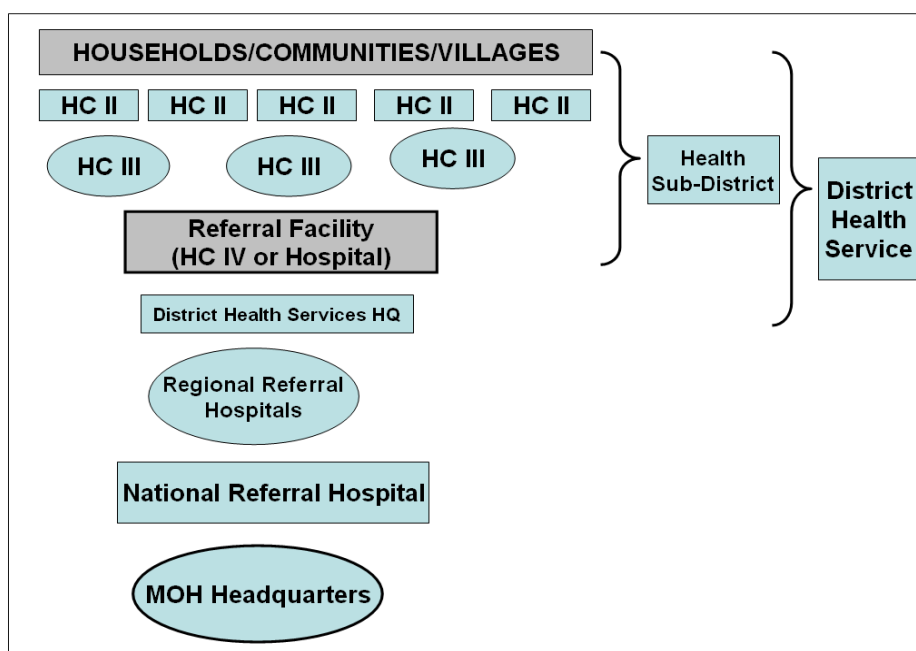
Table 5-1: Key National Demographic and HIV Epidemiological Data

Total Population	34,844,095
HIV Prevalence (%)	7.3%
AIDS Deaths (per year)	31,000
PLHIV	1,439,974
Incidence Rate (per year)	0.8%
New Infections (per year)	140,000

5.3 Uganda's Public Health System

Uganda's public health system is made up of the MoH headquarters, two national referral hospitals, 13 regional referral hospitals, 38 general hospitals, 214 county-based Level IV health centres (HCIV), 826 sub-county-based Level III health centres (HCIII) and 2,169 parish-based Level II health centres (HCII) as shown in Figure 5.2 (MOH 2015).

Figure 5-2: The Public Health System of Uganda



Source: Ministry of Health Strategic Plan (MOH 2015)

The general hospitals, where they exist, and the county-based HCIVs, serve as the referral points for what is termed as the health sub-district comprised of the HCIIIs and HCIIIs in the district or the county. In Uganda, HIV services are provided mostly in HIV outpatient clinics based at the two national referral hospitals, 13 regional referral hospitals, 38 general hospitals, 214 HCIVs, and 316 HCIIIs (MOH 2015). Even though it has not happened since 2004 when first proposed, the GoU continues to envision that nurse-led ART clinics will be based at HCIVs and HCIIIs, which are closest to the population in need of HIV services (MOH 2015).

5.4 Overview of Antiretroviral Treatment in Uganda

Since the early 1990's, Uganda has been at the forefront of many SSA countries regarding the declining incidence of HIV, resulting mainly from effective leadership, prevention, education, and treatment. In keeping with the HIV continuum of care strategy, the GoU promotes and supports universal access to free ART at the point of delivery to all those in need of it. As early as 2003, the government developed a national strategy to expand access to ART through public and private sector partnership (MOH 2003). Expansion of ART services at government healthcare facilities is phased nationwide and is mainly supported by the Global Fund for HIV/AIDS, Tuberculosis, and Malaria (GFATM), while the United States of America Presidential Emergency Plan Fund for AIDS Relief (PEPFAR) supports the non-profit health facilities (MOH 2015).

Under its public health and primary care model, Uganda promotes the team-based approach in providing ART, where doctors play the leading role in assessing PLHIV for ART eligibility, initiating or switching treatment, managing serious medical conditions, and supervising staff. Nurses and counsellors provide counselling and initial diagnosis, patient education, psychosocial support, prevention for positives, clinical staging, prophylaxis (cotrimoxazole, fluconazole), preparation for ART, initiation of a fixed-dose first-line ARV regimen in patients without complications under the supervision of doctors, and follow-up of patients on ART. Nurses also conduct clinical monitoring, response to side effects, adherence preparation and support, management of chronic problems including treatment of common opportunistic infections, data collection based on a simple treatment card and referral of those in need of specialised care (MOH 2003).

In taking the decision to promote the team-based approach in providing ART, Uganda built on the experience of its own community AIDS service organisations and on the experience from other countries that have adopted similar approaches (Grubb, Perriens et al. 2003, Okero, Aceng et al. 2003, Okero, Aceng et al. 2005). This model is very much similar to the WHO public health approach to ART upscaling (WHO 2003b). It uses a standard fixed dose first line, second line and third line ART protocols aided by simplified monitoring procedures. Most patients are started on a standard first line and are only moved to the second and third line in cases of treatment failure. This is done to

make ART easy and cheap to use. In the absence of laboratory facilities, the policy advocates for the use of clinical symptoms and signs to start patients on ART (MOH 2003).

Nurses form the bulk of healthcare workers providing ART in most healthcare facilities in Uganda (MOH 2015, Spies, Gray et al. 2016). The proposed nurse-led ART delivery model will entail giving nurses, based mostly at lower level healthcare facilities, more authority and autonomy to provide HIV care including initiating first-line ART in uncomplicated patients, managing, and referring only the complicated patients to doctors (MOH 2015). The HIV burden, the HRH situation, and task shifting in Uganda are briefly discussed in the next section.

5.5 Human Immunodeficiency Virus, the Human Resources for Health, and Task Shifting in Uganda

The HIV prevalence in Uganda estimated at 7.3 percent among the 14-49 years age group is very high (UAC 2016). This high prevalence is mainly due to two major reasons, including improved access to ART, which is keeping many HIV-positive patients alive, and new infections. Approximately 1.5 million Ugandan children and adults are living with HIV, of whom 874,124 persons were accessing lifesaving antiretrovirals (ARVs) by June 2016 (UAC 2016). The major reason for not reaching universal access, as stipulated in Uganda's ART policy, continues to be the lack of trained healthcare workers, particularly doctors, who are still the only ones legally mandated to initiate this treatment (O'Brien and Gostin 2011, Baine and Kasangaki 2014, UAC 2016).

The provision of ART is labour-intensive (Kombe and Galaty 2005, Hirschhorn, Oguda et al. 2006, WHO 2007a), with the WHO recommending a team consisting of a minimum of two doctors and seven nurses for every 1,000 HIV-positive patients on ART (Hirschhorn, Oguda et al. 2004, WHO 2007a, WHO 2007b, WHO 2007d). Using these estimates, Uganda would require at least 3,200 doctors to put its 1.6 million HIV-positive people on ART using the new WHO guidance of 'Test and Treat'. This number is far beyond the estimated 2,300 doctors who were working in Uganda's public health

system in 2012 (MoFPED 2013). Given their small number, it is unreasonable to expect doctors to take care of all the healthcare needs of the population, including those of PLHIV. The requirement that only doctors initiate ART is thus a significant barrier to access (MOH 2003, The-Capacity-Project 2007, Baine and Kasangaki 2014). With Uganda's doctor-nurse ratio of 1:12 (MoH 2016), it would be sensible to empower nurses legally to initiate ART and to manage stable patients since they are many more than doctors, even though their number is also inadequate.

Task shifting has been reported to be the mainstay of health service delivery in Uganda for a long time (Zachariah, Ford et al. 2009, Bryar, Kendall et al. 2012, Emdin and Millson 2012, Dambisya and Matinhure 2012, WHO 2014, Zuber, McCarthy et al. 2014, Chamberlain, Stolz et al. 2015, Mijovic, McKnight et al. 2016, Spies, Gray et al. 2016), even when there is no official policy or guidelines to support it (Baine and Kasangaki 2014). In practice, tasks have been shifted across different cadres, from specialist doctors to non-specialist doctors, from doctors to clinical officers, and from nurses to nursing aides, among others (Mullan and Frehywot 2007, Baine and Kasangaki 2014). Clinical officers have been reported to handle health conditions such as post-abortion cases and minor surgery, while nurses give anaesthesia to patients undergoing surgery and perform medical male circumcision, tasks previously reserved for doctors (Baine and Kasangaki 2014). Unsurprisingly, as is the case in many other countries in SSA, task shifting in Uganda is driven by severe shortages in HRH and the high demand for healthcare services (Baine and Kasangaki 2014).

Since the inception of the Uganda national ART programme in 2004, nurses have inevitably taken on tasks such as history-taking, ordering for laboratory investigations, making diagnoses and prescribing medications including ART, all tasks traditionally reserved for doctors (Guberski 2007, Philips, Zachariah et al. 2008, Stevens, Mathijs et al. 2008, WHO 2008, Baine and Kasangaki 2014). Indeed, for some time now, nurses in Uganda have been envisaged to provide and are surely providing, primary healthcare services including ART in medically under-served rural areas and in urban clinics with high patient loads (Okero, Aceng et al. 2005, Guberski 2007, WHO 2007a, Baine and Kasangaki 2014). Although the few studies conducted in Uganda have revealed that task shifting offers high quality and cost-effective care to more patients than a doctor-centred

model, major barriers have been identified with it (Nganwa 2008, Callaghan, Ford et al. 2010, Baine and Kasangaki 2014). Such barriers have included a lack of legislation to grant lower cadres the authority and autonomy to perform clinical tasks, reluctance to change views on which cadres should perform which services based on their training, and issues to do with professional boundaries and regulations (Nganwa 2008, Callaghan, Ford et al. 2010, Baine and Kasangaki 2014, Spies, Gray et al. 2016). The other challenges to effective task shifting have included inadequate and unsustainable training, lack of support and pay for staff in new roles, difficulties of integration of new members into healthcare teams, and lack of compliance with regulatory bodies (Nganwa 2008, Callaghan, Ford et al. 2010, Baine and Kasangaki 2014, Spies, Gray et al. 2016). Another significant barrier to task shifting is the overreliance on donor funding for the AIDS response in Uganda (DANIDA 2014). For example, in 2014, PEPFAR provided more than eighty percent of the resource envelope, GFATM and other bi-lateral donors contributing at least ten percent, while the GoU only contributed between 5 and 10 percent of the resource envelope (DANIDA 2014, PEPFAR 2015). Uganda's overreliance on external donors to run its national HIV programme is worrying since it threatens sustainability, especially that funding from them has stagnated over the years (Giorgio, Moses et al. 2016).

Issues for further consideration arising from the Ugandan experience of task shifting can be broadly categorised into two groups (ECSA-HC 2010, Dambisya and Matinhure 2012, Baine and Kasangaki 2014). The first group comprises of human resource issues including the reluctance to change, protection of professional turf, unclear professional boundaries and regulations, heavy workload, high disease burden, and the under-utilisation of unemployed healthcare professionals. The second group of issues for consideration is related to strategic leadership as reflected in the identification of poor planning, lack of a task-shifting champion and lack of guidelines as barriers to implementation of task shifting. Since these barriers have been identified in studies on general task shifting, whether the same or other issues influence the development and implementation of effective nurse-led ART clinics in Uganda remains questionable and is the concern of the current study. In the next three chapters, I present the results of this study, starting with those on patients' experiences with, and attitudes and views towards nurses as providers of expanded HIV clinical services.

6 Patients' Experiences with, and Attitudes and Views towards Nurses as Providers of Expanded HIV Clinical Services

6.1 Introduction

This chapter presents the results of Objective 1 of this study, an objective that seeks to understand the patients' experiences with, and attitudes and views towards nurses as providers of expanded HIV clinical services including ART. Specifically, the chapter presents the findings of questionnaire survey interviews with 279 participants (patients on ART), as well as the findings of four FGDs conducted to explore and understand issues that emerged from the survey. The qualitative interviews, unlike the closed-ended survey, enabled me to hear more directly from patients, in their own words, how they defined quality ART services, what qualities they used to define a competent ART healthcare provider, and why they chose those qualities.

The results are presented in four sections including characteristics that patients use to determine nurses' competencies in ART provision, patients' perception of nurses' and doctors' competencies in the provision of the different HIV care services, the overall acceptability of nurse-led ART clinics, and the chapter summary. Hereafter, in this chapter, the patient-participants will be referred to as patients.

6.2 Nurse Characteristics that Patients use to Determine Nurses' Competencies in Antiretroviral Treatment Provision

Patients in this study considered nurses' age, gender, education level, and their previous experience with receiving HIV-specific services from nurses to determine whether the nurse was competent in ART provision or not, as summarised in Table 6.1 below.

Table 6-1: Nurse Characteristics that Patients use to Determine Nurses' Competencies in Antiretroviral Treatment Provision

Question about nurse characteristics	Number (n)	Percentage	95% CI
Does the nurse's age determine nurses' competence in ART provision? (N=279)			
Yes	232	83.1	79.0-87.2
No	47	16.9	13.1-20.7
<i>If Yes, what is the preferred age?(N=232)</i>			
Less than 40 years	83	36	33.8- 38.2
More than 40 years	149	64	60.7- 67.3
Does the nurse's gender determine nurses' competence in ART provision? (N=279)			
Yes	156	55.9	50.0-61.7
No	99	35.5	29.8-41.1
Unsure	24	8.6	5.3-11.9
<i>If Yes, what is the preferred gender? (N=156)</i>			
Female	156	100	
Male	0	0	
Does the nurse's educational level determine nurses' competence in ART provision? (N=279)			
Yes	269	96.4	94.2-98.6
No	10	3.6	2.5-4.7
<i>If Yes, what is the preferred education level? (N=271)</i>			
Diploma	179	65.8	60.1-71.5
Degree	92	34.2	28.5-39.9

6.2.1 Nurses' Age

Of the 279 patients interviewed, 232 (83 percent) thought that the nurse's age was an important determinant of technical competencies in ART provision. Of the 232 who considered age important, 149 (64 percent) thought that nurses aged 40 years and above were more appropriate to run nurse-led ART clinics (Table 6-1).

As in the survey, most participants in the FGDs used nurses' age to gauge their technical competence in ART service provision. Most of them preferred older nurses whom they believed had gained the necessary experience and thus the competence to handle ART

initiation prescription and to manage any complications that could arise. A female participant in one of the FGDs illustrated these thoughts:

“I think older nurses are very competent in HIV care . . . they have over time seen many HIV-positive patients . . . the older nurses have met all there is to see concerning HIV and have developed the necessary knowledge and skills to handle all aspects of HIV care, including complications arising from ART.”

Some patients also believed that older nurses could handle HIV-positive patients with more understanding and confidentiality. For example, one female participant in another FGD said, *“I prefer older nurses because they understand my concerns better than younger ones.”* A male participant in the same FGD endorsed this view by describing his dislike for young nurses when he said, *“Oh yes, I don’t like young nurses. They don’t keep secrets . . . The young nurses tell others whatever you tell them about yourself.”*

6.2.2 Nurses’ Gender

Of the 279 patients in the survey, 156 (56 percent) preferred female to male nurses as providers of ART, with only 99 (36 percent) of them preferring male nurses, while the rest did not have any gender preference (Table 6-1). Patients in the FGDs expressed similar sentiments saying that they preferred nurses of the same gender as themselves, especially for consultations they considered more intimate in nature. For example, a female participant in one FGD shared her story that when she had a problem in her genital area, she found it much easier to discuss it with the nurse who was a woman, than with the doctor who was a man. Other female participants in the same FGD supported her view by expressing their unwillingness to seek advice from male doctors in preference for female nurses if they had genital problems. This feeling was common among female patients as further demonstrated by two other female participants from another FGD. One participant mentioned her sensitivity to gender when seeking treatment, *“I had a problem in my genital area . . . however, I could not tell the doctor because you know he is a man. I found it much easier and usual to tell the nurse who is a woman like me.”* Another participant agreed with her colleague but added the age dimension to her preference: *“If I have a complaint in my ‘private parts’ . . . I prefer nurses who are females like me . . . the doctors are mostly young men who might ask to see . . . I really don’t like that.”*

On the contrary, the male patients did not seem to consider gender as an important issue in determining nurses' competence, as was illustrated by one male participant: *"I do not have any problem with a female nurse or doctor asking to see any part of my body if it is deemed necessary . . . I see no problem whatsoever."*

6.2.3 Nurses' Education Level

Of the 279 patients, 269 (96 percent) thought that the education level of the nurse providing ART was an important determinant of competence. Of the 269 who considered education level critical, 179 (66 percent) believed that the nurse providing ART should have a minimum qualification of a diploma in nursing while 34 percent of them thought that the minimum qualification for that nurse should be a degree in nursing (Table 6-1).

Corroborating the survey findings, most participants in the FGDs felt that nurses with adequate education and experience in HIV care had acquired the necessary competencies to provide high-quality HIV care, including ART initiation prescription, without the help of doctors. For example, a female participant in one FGD said, *"I think nurses with adequate education and appropriate experience in HIV care have acquired the competencies to provide good quality HIV care on their own"*. In these FGDs, the participants who placed a high value on nurses' education and qualifications thought nurses running these clinics should have at least a diploma in nursing. Most patients did not think that a nurse with a certificate in nursing had acquired the necessary competencies to initiate ART in new clients safely. A male participant who illustrated this thinking said, *"Well, I think if a nurse has a diploma in nursing and a specific education in HIV care, she can prescribe my ART."*

Some participants believed that for nurses to prescribe ART safely, they should acquire special knowledge in HIV care through training and access to updates. For example, one male participant said, *"I see no drawbacks, not at all, as long as I see a nurse with specialised HIV training . . . you know who has access to updates in HIV care"*.

However, a few patients thought to the contrary, insisting that nurses did not have what it takes regarding education and therefore had to work alongside doctors for them to initiate ART safely. A male participant illustrating this feeling said:

“No . . . whether with a degree in nursing or not, nurses do not have the necessary medical education to initiate ART safely, and they have to work alongside doctors as it has always been . . . Why then do we have doctors and nurses in the hospital at the same time?”

In agreement, a female participant in another FGD said:

“The complexity I can see, if there is some change in my health condition, I don’t think the nurse has the necessary education and skill to manage that kind of situation. Then the nurse really has to refer back to the doctor . . . which is sort of a put-off . . . why not see the doctor together with the nurse as is the case now?”

6.3 Patients’ Previous Experience with Receiving HIV-Specific Services from Nurses

To varying degrees, most patients mentioned that they had received all but one HIV-specific service from nurses. All the patients reported that nurses had taken their history, educated them on HIV prevention and the importance of taking medications, prescribed to them for opportunistic infection prophylaxis, and provided them with ART follow-up services. Most of them, 212 (76 percent), reported that nurses had managed their minor ARV side effects, diagnosed opportunistic infections in them, and ordered laboratory investigations and interpreted laboratory results for them. Sixty-six percent of them reported that they had received treatment for opportunistic infections such as oral thrush and herpes zoster, had received an assessment for ART eligibility, and had had ART prescription initiation from a nurse.

Of the 36 patients who developed TB, only 14 (39 percent) reported that they had received both TB treatment and ART from a nurse and 10 of 53 (19 percent) of the patients who reported developing meningitis at one time said that they had received treatment from a nurse. Of the six patients who needed second-line treatment, only one reported that a nurse had switched her prescription. The only HIV-specific service, which none of the patients reported to have ever received from a nurse, was the management of

severe ARV drug side effects. Thirteen clients reported that they had developed severe side effects.

In conformity with the findings from the survey, most participants in the FGDs reported that they had received numerous HIV-specific services from nurses, except for those who had complicated conditions. Patients with previous experience of receiving HIV-specific services from nurses rated nurses' competencies highly and linked their confidence in nurses to instances where nurses had solved their health problems, which doctors had either ignored or missed. For example, a male participant who linked a particular nurse's enhanced competence to his experience with her said:

“I had been seeing the nurse for a long time. So one time the nurse already knew something was wrong when I explained to her about a headache I had developed after taking my ARVs, but unfortunately, the doctor had ignored that . . . the nurse in this clinic is quite good. I have confidence in her . . . she can initiate ART and manage any complications that may arise quite well.”

Other members of the FGD affirmed his experience.

6.4 Patients' Perceived Differences of Doctors' and Nurses' Interpersonal Skills

In this section, the comparison made by the patients between doctor's and nurse's interpersonal skills are presented as interpersonal skill domains in which patients perceived nurses to perform better than doctors and interpersonal skill domains in which patients did not perceive any differences in performance between nurses and doctors.

6.4.1 Interpersonal Skill Domains in which Patients Perceived Nurses to Perform Better than Doctors

During the survey, when the 279 patients were asked who was better at various interpersonal skill domains, 251 (90 percent) of them thought that nurses were better than doctors at giving clients sufficient time during a consultation, promoting clients' needs, and talking to clients in a clear and respectful way. The same number of patients (n=251) thought that nurses were better than doctors when it came to involving clients' families in support care provision, listening to clients in a way that made them feel comfortable, helping clients understand their HIV disease condition, and helping clients understand their ARV medicines. Seventy-nine percent thought that nurses were better than doctors at gaining personal knowledge of their clients, meeting their clients' emotional needs, and talking to their clients with respect.

During the FGDs, patients perceived that nurses performed better than doctors in four specific interpersonal skill domains including giving clear explanations, listening attentively, giving enough time for consultation, and paying attention to detail. Each of these interpersonal skill domains is presented in the next sections.

6.4.1.1 Giving Clear Explanations

Among the four interpersonal skill domains, giving clear explanations to clients was a dominant theme of discussion among most FGD patients. One participant who explained the value of clear explanations to patients said:

“A competent HIV care provider is one who explains to me in a way that is easy for me to understand . . . using illustrations and using words that I can easily understand . . . to me, it does not matter whether it is a nurse or a doctor . . . moreover, the nurses I have met are certainly much better than doctors at this.”

The other FGD members nodded affirmatively.

To these patients, nurses explained things better than doctors, which enabled patients to understand better their HIV disease condition and their medication. They complained that doctors tended to use complicated medical language, which made it difficult for patients to understand their HIV disease condition. They also complained that most

times, doctors prescribed medicines to patients without giving clear explanations about how to use them, and without explaining why certain types of medicines were given and not others. They further said that this lack of clear explanations from doctors often resulted in confusion about how to take the medicines, and often resulted in poor adherence. A male participant who preferred nurses to doctors illustrated this confusion: *“I do not have medical training . . . moreover; I would be wondering why the doctor cannot tell me in plain language . . . I honestly prefer the nurse because I understand very well whatever she tells me.”*

Another female participant in the same FGD who also preferred nurses said: *“I prefer nurses for my review . . . The nurses explain and describe my disease and my medication in an easily understandable way . . . The only time I need a doctor is when I have a complication.”*

A female participant from another FGD gave another dimension to the preference for nurses who attempt to explain medicines in a creative way: *“The nurses explain my disease well and in a detailed manner. There is also this particular nurse who also uses local stories to make sure that I learn more about the medicines I am taking.”*

This effort by nurses to explain complex information in a simplified way was highly appreciated by most participants in the FGDs. A male participant, in acknowledgement of nurses' ability to explain complex information about their disease condition and medication in a simplified way, said: *“The nurse I usually see explains things so clearly, helping me to understand how the drugs are working. Each time I see her, I come out feeling much clearer about my ARV medicines because I really didn't know anything before.”*

6.4.1.2 Listening Attentively

In the FGDs, participants considered nurses and doctors who are good listeners to be highly competent in ART provision. They explained that they considered these nurses and doctors highly competent ART providers because they understood their clients'

concerns and their disease condition better and were thus able to give them appropriate treatment and advice. Most patients gave examples of doctors, and in a few instances nurses, whom they felt did not listen to them adequately. For example, one male participant gave his complimentary opinion about a nurse who listens to him when he said, *“The nurse, unlike the doctor, truly listens to me and does not ignore my concerns and feelings . . . the nurse is really superb and competent”*. In agreement with this participant, most FGD participants reported that they related well with nurses, unlike with doctors whom they thought did not give them enough attention. They said that this relationship made them feel more comfortable to ask questions and raise concerns more often with nurses than with doctors. Some patients further said that because nurses listened to them well, they often understood their plight and were able to treat them well. A female participant in illustration of this feeling said: *“The nurse listens to us well, and she can understand our situation. Everything she says after is very logical and clear. I have a feeling she is very competent at her work, and I do not mind getting my ART prescription from her”*.

6.4.1.3 Giving Enough Time for Consultation and Paying Attention to Detail

Patients in FGDs valued the amount of time spent during consultations and their healthcare providers’ attention to detail. However, to their disappointment, they described how they received insufficient consultation time resulting in limited communication with doctors during ART sessions. They complained that doctors were consistently busy doing something else during the consultation and rarely had time to listen to or talk to them during the clinic review sessions, observing further that the only time doctors seemed to interact with them was when they were prescribing medicines. Even then, they noted that the doctor-patient communication rarely went beyond their HIV condition. One male participant described his hurried experience with a doctor: *“The doctor does not spend time to talk to me during consultations. When I enter his room, he only says ‘How are you today?’ . . . The only other time he spends talking to me is to ask me to go to the lab for my CD4 test.”*

Other participants in the same FGD concurred with him, saying that such an experience is a common occurrence. For example, a male participant reported: *“The doctor usually appears to be too busy . . . moreover, he is mostly performing a procedure . . . You can*

have several ART clinic review sessions, and he will rarely have a chat with you . . . That wouldn't really happen with the nurse."

This practice of poor engagement of patients by doctors was considered a disadvantage of seeing doctors since they could not serve the patient adequately. To illustrate this thinking, a female participant in another FGD said, *"Nurses are more competent in ART than doctors are because they can educate ARV clients about HIV transmission and ARV medicines and how they work, unlike the doctors."*

Some patients also mentioned that they gained confidence in nurses' competencies in ART provision from the way nurses devoted their time to concentrate on the consultations and pay attention to detail. A female participant illustrating her increased confidence for nurses said: *"I am very confident of the nurse's skills in HIV care. . . She takes her time and concentrates . . . she is thorough at what she does, asking all the relevant questions about my condition."* Other group members nodded affirmatively.

6.5 Interpersonal Skill Domains in which Patients Perceived No Difference in Performance Between Nurses and Doctors

In the survey, 251 (90 percent) of the patients perceived no differences between the nurses and the doctors in most interpersonal skill domains. These included respecting clients as individuals with personal beliefs, ensuring clients' privacy during consultations, not sharing clients' information with others unless the client agreed to it, and providing equal care to all clients without discrimination. Only 133 (48 percent) of the patients felt that there was no difference in the way nurses and doctors examined them, including making them feel comfortable, and 126 (45 percent) of them felt that nurses did this better than doctors.

However, in the FGDs, participants did not mention that they used the criterion of *"ensuring clients' privacy and confidentiality"* to determine nurses' or doctors' competencies in HIV care, despite several attempts I made to probe them on this issue. Furthermore, patients did not report any difference between nurses and doctors in the

provision of equal care to all HIV-positive patients without discrimination and in ensuring patients' privacy and confidentiality. A male participant in one FGD reported: *"There is no difference between nurses and doctors in ensuring our privacy and confidentiality . . . it all depends on the nature of a particular nurse or doctor as an individual . . . Really, there is no difference between the two."*

However, the need to respect HIV-positive patients as individuals with personal beliefs featured prominently in the FGDs. Patients viewed nurses and doctors who were competent in ART provision as those who treated their patients as valuable individuals. One participant defined competent ART providers as those able to recognise, acknowledge, and accept patients as unique individuals with distinctive perspectives and health conditions. In conformity to this belief, a participant in the same FGD explained that competent ART providers were those nurses and doctors who appreciated differences among patients and did not make the same diagnosis and treatment for everyone.

Participants in the FGDs rated highly nurses and doctors who actively involved their patients in decision-making about their ART care. They noted that nurses were better than doctors at involving them in their care. One male participant who preferred nurses to doctors explained: *"Nurses are competent in ART provision because they involve us in care and do not look down on us . . . I don't like doctors because they relate to us like we are children."*

6.6 Established Healthcare Provider-Patient Relationships and Honesty

Although established healthcare provider-patient relationships and honesty of healthcare workers were not among the a priori issues investigated in the survey, they came up during the FGDs with patients - each of them is presented below.

6.6.1 Established Healthcare Provider-Patient Relationships

Participants in the FGDs expressed how established healthcare provider-patient relationships were important in the care of chronic conditions such as HIV. They explained that these relationships between patients and their healthcare providers grew with time. These patients mentioned that over the time, they had established meaningful relationships with nurses more than with the doctors whom they said they rarely saw.

Patients viewed the continuity of care with the nurses as an advantage for the proposed nurse-led ART clinics because nurses developed a better understanding of patients' social circumstances, disease conditions, and their treatment needs. They further argued that because of these relationships, nurses became more knowledgeable about individual patient conditions, and thereby made better treatment decisions than doctors. A male participant in one FGD illustrated that perception when he said, *“The nurse is competent because she is always present at the HIV clinic. . . She spends more time with us than the doctor does . . . she is much aware of what is happening in our lives.”* A female participant in the same FGD also explained her preference for nurses to doctors whom she considered unreliable in offering consistent care:

“Each time when you come, you find another doctor . . . If you are lucky to find one at all, you find a different doctor now and then, so they don't get to know you or your disease condition, unless they look at your records, but the nurses are here most times . . . the nurse gets to learn you and know you off-head.”

6.6.2 Honesty

Honesty as a nurse attribute was not investigated a priori in the survey, but it came out in all the four FGDs as an important criterion that patients used to determine whether a nurse was competent in ART provision. They considered competent nurses in ART provision as those who were sincere about what they could or could not do. Furthermore, patients considered competent nurses in ART provision as those who acknowledged mistakes, took responsibility, and apologised for them. A male participant who rated honest nurses as competent said: *“A nurse is competent in ART provision so long as she is honest about what she can or cannot do . . . moreover, if mistakes are made she can point them out and take responsibility for those mistakes.”*

6.7 Patients' Perception of the Quality of Human Immune-Deficiency Virus Clinical Tasks Provided by Nurses and by Doctors

In this section, HIV clinical tasks in which patients perceived nurses to perform better than doctors, HIV clinical tasks in which doctors were perceived to perform better than nurses, and HIV clinical tasks in which patients did not perceive a difference in the quality of care provided by nurses and doctors are presented. These perceptions are summarised in Table 6.2.

Table 6-2: Patients' Perception of who between nurses and doctors is more competent in the performance of the different HIV clinical tasks

HIV Clinical Task	Number (N=279)	Percentage	95% CI
History taking			
Nurse	172	61.6	55.9-67.4
Doctor	107	38.4	32.6-44.1
No difference	0	0.0	
Education about HIV disease prevention and adherence to medication			
Nurse	225	80.6	76.0-85.3
Doctor	54	19.4	14.7-24.0
No difference	0	0.0	
Managing ARV patients who develop meningitis			
Nurse	0	0.0	
Doctor	279	100.0	
No difference			
Switching Clients from First-line to Second-line ARVs			
Nurse	0	0.0	
Doctor	277	99.3	98.2-100.0
No difference	2	0.7	0.0-1.7
Managing ARV patients who Develop TB			
Nurse	0	0.0	
Doctor	239	85.7	81.5-89.8
No difference	40	14.3	10.2-18.5
Diagnosis of illnesses (OIs)			
Nurse	2	0.7	0.3-1.7
Doctor	147	52.7	46.8-58.6
No difference	130	46.6	40.7-52.5
Interpreting laboratory results			
Nurse	2	0.7	0.3-1.7
Doctor	140	50.2	44.3-56.1
No difference	137	49.1	43.2-55.0
Assessing ART eligibility			
Nurse	2	0.7	0.3-1.7
Doctor	62	22.2	17.3-27.1
No difference	215	77.1	72.1-82.0
Management of severe drug side-effects			
Nurse	0	0.0	
Doctor	275	98.6	97.2-99.9
No difference	4	1.4	0.0-2.8

6.7.1 Human Immune-Deficiency Virus Clinical Tasks in which Patients Perceived Nurses to Perform Better than Doctors

During the survey, all 279 patients were asked whether they thought doctors or nurses were more competent at performing different HIV clinical tasks. Most participants thought that nurses perform better than doctors at the HIV clinical tasks of history taking, provision of education on HIV disease prevention, and provision of education on adherence to medications. Specifically, 172 (62 percent) believed that nurses are better than doctors at history taking, while 225 (81 percent) of them thought that nurses are better than doctors at the delivery of HIV prevention education and provision of education on adherence to medications (Table 6-2).

During the FGDs, most participants agreed with the survey findings arguing that nurses are better than doctors at history taking, provision of education on HIV disease prevention, and provision of education on adherence to medications, reasoning that these were nurses' natural roles. A male participant in illustration of this thought said: *“I would definitely prefer to receive HIV prevention counselling and education about HIV and medicines from the nurse . . . Nurses have a special way of doing this kind of thing . . . You feel them.”*

6.7.2 Human Immune-Deficiency Virus Clinical Tasks in which Patients Perceived Doctors to Perform Better than Nurses

During the survey, most patients felt that doctors performed better than nurses in interpreting laboratory results, diagnosing clients' illnesses, managing severe drug side effects, managing ARV clients who developed diseases such as TB and meningitis, and switching clients from first-line to second-line ART in those who developed complications. Specifically, all 279 patients thought that doctors managed HIV-positive patients on ART who developed meningitis better than nurses and 277 (99 percent) of them thought that doctors performed better than nurses in switching clients from first-line to second-line ARVs and in managing severe drug side effects (Table 6-2). Furthermore, 239 (86 percent) of them thought that doctors managed HIV-positive patients on ART who developed tuberculosis disease better than nurses, and 147 (53

percent) of them thought that doctors were better than nurses at diagnosing HIV-related illnesses (Table 6-2).

During the FGDs, most participants agreed with the survey findings and explained that doctors were more educated than nurses and thus more technically competent at diagnosing and treating complicated illnesses. A male participant in illustration of this feeling said:

“I would definitely choose to see a doctor if I felt I needed technical advice on something serious, like if I needed second-line HIV medicines or developed serious ARV side-effects . . . I would go straight to the doctor and not to the nurse . . . I mean doctors are better trained and understand stuff like that better.”

6.7.3 Human Immune-Deficiency Virus Clinical Tasks in which Patients Perceived No Difference in the Quality of Care Provided by Nurses and by Doctors

Most patients in the survey (81 percent), perceived no difference between the quality of care provided by nurses or doctors in some of the HIV clinical tasks. These included the prescription of cotrimoxazole for prophylaxis, prescription of medicines for opportunistic illnesses, management of simple drug side effects, follow-up of patients on ART, and referral of patients who develop or present with difficult conditions.

This thinking came out precisely in the FGDs when patients stated that anyone with basic training in health could do simple tasks such as prescription of cotrimoxazole for prophylaxis, follow-up of clients on ART, and management of simple side effects without much difference. As one participant in a FGD summarised it all, *“There are things that don’t need a university degree to do, things like prescribing cotrimoxazole . . . no difference whether it is the nurse or the doctor who does it”*.

6.8 Patients’ Definition of a Competent Antiretroviral Treatment Provider

During the FGDs, some patients considered nurses’ and doctors’ interpersonal qualities – such as being welcoming, gracious, forthcoming, warm, humane, gentle, considerate,

compassionate, empathetic, sensitive, hopeful, approachable, sociable, pleasant, friendly, happy, and constantly smiling and showing kindness - to determine their technical competence in HIV care provision. Furthermore, they associated these qualities with more with nurses than with doctors. A female participant who appreciated the virtues she placed on interpersonal qualities said:

"A nurse or a doctor who is competent in HIV care should be able to smile, welcome, and be gentle to his or her clients . . . This shows that he or she cares about you as a person and will certainly do their best to provide you with the best treatment there is . . . Moreover for me, this is what I find in my nurse . . . it is more important to me than the qualifications of the doctors . . . It certainly makes me feel better, and I know the nurse is competent in HIV care."

However, other patients defined technically competent ART providers as those that were able to ask appropriate questions about the clients' HIV disease condition, examine clients well in an orderly manner, order for appropriate laboratory investigations, prescribe appropriate medicines, and monitor treatment outcomes. Some other patients thought that technically competent ART providers were nurses and doctors who were able to follow guidelines from the government as well as apply their medical knowledge and skills appropriately to solve ARV clients' health problems. Yet others mentioned that technically competent ART providers are those who are aware of their limitations and know when to call their superiors for help. That perception was demonstrated by a male participant who gauged the competence of ART providers by specifically looking at what they did during care. To him: *"Competent ART providers should be able to ask suitable questions, examine well, and give proper medications. Also, they should be able to consult others when faced with difficulties."*

6.9 Perceived Benefits of Nurse-Led ART Clinics by Patients

In the survey, all the 279 patients agreed with the notion that the introduction of nurse-led ART clinics would help reduce waiting time and subsequently lead to an increase in the number of HIV-positive patients receiving ART and in the range of services available to them. One hundred and fifty-eight (65 percent) thought that the nurse-led ART clinics would improve the quality of care provided to HIV-positive patients.

These findings were supported in the FGDs with most participants observing that empowering nurses to prescribe ART for initiation and to conduct clinical review sessions, which at the time entailed seeing both the nurse and the doctor on the same visit, would improve the quality of care and access to ART services. They explained that nurse-led ART clinics would spare some of the doctors' time, enabling them to concentrate on the management of complicated cases. They further argued that since nurses would be able to prescribe ART for initiation and medications for opportunistic infection, clients would no longer have to wait for the nurse to obtain a prescription from a doctor.

Other patients also argued that nurse-led ART clinics would make it easier for HIV-positive patients to access medication because nurses are more available at the clinics than doctors. For those reasons, most patients supported the proposed nurse-led ART clinic initiative, reckoning that it would certainly improve access to HIV care under the prevailing circumstances where doctors were very few. For example, a female participant expressed this view: *“Doctors are almost impossible to come by . . . These nurse-led ART clinics will certainly improve access to ART.”*

The patients were also clear that nurse-led ART clinics would help improve timeliness and accessibility of HIV care services to those in need of them. As one participant explained, *“I would go anywhere . . . if it is quick, easy, and readily accessible . . . I don't really want to know if the clinic is run by a nurse or a doctor . . . If I feel pain, I want something done.”* In concurrence, a participant in the same FGD said, *“Quick prescription is what I want. I don't really mind who does it.”*

6.10 Overall Acceptability of Nurse-Led ART Clinics by Patients

The survey results revealed that whereas 271 (97 percent) patients were willing to receive an assessment for ART eligibility from a nurse, only 179 (64 percent) were willing to have their ART initiation prescription made by a nurse. Surprisingly, despite the high percentages of willingness amongst patients to receive many of the HIV-specific

services from nurses, only 30 (11 percent) of them would go for a nurse-led ART clinic in preference to a doctor-led clinic, if given the option.

The finding that a few patients in the survey opted for nurse-led ART clinics over the traditional doctor-led ART delivery model was also observed in the FGDs, with most participants saying that they only wanted nurses to prescribe ART for initiation when doctors were not available. They perceived the roles of nurses in HIV care as those of health education, counselling, and monitoring clients' progress while on ART. Some patients also felt that nurses were better suited to manage HIV-positive patients with minor complaints such as skin illnesses, oral thrush and headache, whereas patients with conditions they perceived to be more complicated such as severe drug side-effects, meningitis, and second-line ART needed to be seen by doctors whom they thought were better trained to manage such illnesses.

Some participants in FGDs explained that they would be willing to receive HIV care from nurse-led ART clinics because HIV was a chronic disease, which did not necessitate making new diagnoses all the time. It is apparent that these patients expected nurses only to continue dispensing medication prescribed initially by doctors but not to make new diagnoses and not to initiate treatment because they felt that nurses did not have the necessary knowledge and skills to do that. A male participant reflected this view, saying:

“If the nurse is to work with patients who have been diagnosed and it is a matter of regular check-ups, patient education, then is okay with me . . . however, if I am a new patient, or I develop a new condition, I want to see a doctor who is trained to do that . . . though, I could see a nurse if there is no doctor.”

Nevertheless, a few participants in the FGDs said that even when given an option between the doctor-led ART clinic and the nurse-led ART clinic, they would still choose the nurse-led ART clinic. They argued that nurses know them at a more personal level than doctors, and thus appreciate patients' challenges such as lack of food and lack of money for school fees. One female participant who reflected this view said, *“I ask the nurses a lot more than the doctor . . . I find it easy especially with social problems, I find*

that nurses know a lot more how to handle these kinds of problems than doctors . . . so, I would choose the nurse over the doctor.”

Other patients preferred nurse-led ART clinics because they found nurses more approachable and easier to talk to than doctors. For example, a female participant said, *“When I developed nausea after starting ART . . . it was easier to contact her because she is more welcoming than the doctor who is difficult to approach.”*

Some patients recognised that nurse-led ART clinics were already happening because nurses were prescribing ARVs in most situations. They described situations where nurses prescribed ART but had to obtain doctors’ signature on the prescription they had actually written, viewing these nurses as the ones who in reality had made the prescription while the doctors had only authorised it. These patients wanted the government to recognise these nurses as ART prescribers so that they could be better regulated to ensure patient safety. One participant illustrating the need for recognition of the nurses’ expanded roles in HIV care, said: *“Nurses prescribe the medicines, dispense it and get doctors to sign the prescription after that, but nurses decide what medication clients take.”* Another participant in the same FGD concurred with this opinion, citing her experience to show why she thought nurses were competent prescribers:

“In fact, five months ago I developed TB. I went to the HIV clinic, and the doctor was unavailable. Luckily the nurse happened to be there . . . she examined me and looked at my lab results and said ‘Yes you have got TB’, and wrote out the prescription and gave the medicines and then took the prescription to another doctor to sign . . . it is really the nurse who did it.”

However, some patients did not want nurses who were going to run the proposed nurse-led ART clinics to be given authority to make their own treatment decisions but to work within clear and strict guidelines. They also felt strongly that these nurses should keep within their area of expertise. One male participant with reservations about nurses’ competencies as prescribers stressed, *“In the existence of strict guidelines ... and nurses are professionally qualified, and they are good people, observant people. I mean observant not only in observing things but observing the rules, really then it should be*

okay.” In agreement with the male participant, a female participant in the same FGD said, *“It is quite okay to have nurse-led ART clinics introduced if it is clear that the nurse has received specialised training . . . from a patient’s point of view I think it is fine if the nurse operates within the limits she is allowed.”*

6.11 Chapter Summary

Patients in this study used a wide range of criteria to determine whether a nurse was competent at ART provision or not. In most cases, they considered the nurse’s age, gender, education level, and interpersonal and communication skills, and not necessarily technical expertise, to determine whether a nurse was competent at ART provision or not.

Most patients supported the proposal by the GoU to introduce nurse-led ART clinics for varying reasons. All of them agreed that nurse-led ART clinics would increase the number of HIV-positive patients accessing ART. In addition, some of them felt that nurses were more competent in ART provision than doctors because they had better interpersonal skills, and were always available at the clinics. The results have also revealed that previous experience of receiving ART-specific services from a nurse, nurses’ work experience in HIV care, and the perceived benefits from nurse-led ART clinics are associated with patients’ acceptability of nurses as providers of ART.

Patients also emphasised that their confidence in the quality of HIV services provided by nurses grew because nurses spent more time with them discussing their medical and social problems and took sufficient time examining them, unlike the doctors. Most of the patients considered HIV services such as education about the HIV disease and counselling as more acceptable from nurses whom they felt had an established role and level of experience to provide these services. However, the patients expressed major concerns about nurses’ abilities to manage illnesses and conditions they perceived complicated, with most of them expressing a preference for doctors over nurses if they perceived their illness to be of a serious nature. Such illness and conditions considered complicated included severe ARV medicine side effects, tuberculosis in a patient on ART, and cryptococcal meningitis in a patient on ART, among others.

The biggest surprise is that although most patients supported the introduction of nurse-led ART clinics and gave positive comments about nurses, they confirmed that they would still choose doctor-led ART clinics if given the option. This preference could be due to patients' concerns about nurses' competencies to take up roles formerly played exclusively by doctors, particularly those of diagnosis and prescription.

7 Nurses', Doctors', and other Key Stakeholders' Views on the Factors Influencing the Development and Implementation of Effective Nurse-Led Antiretroviral Treatment Clinics

7.1 Introduction

This chapter presents the results of Objective 2 of this study that seeks to understand the key facilitators and barriers to the development and implementation of effective nurse-led antiretroviral treatment clinics in Uganda based on the perceptions of nurses, doctors, ART coordinators, national ART trainers, policymakers, and officials from both the nursing and medical regulatory bodies. The results are presented in three sections, starting with the study participants' personal characteristics, followed by the themes and subthemes that emerged from the interviews, and lastly the chapter summary.

7.2 Personal Characteristics of the Study Participants

In this study, twenty-six nurses with a median age of 42 years (range 28-58 years) were interviewed. They were all female and registered with a minimum qualification of a diploma in nursing. Each of them had undertaken the MoH two-week course on Integrated Management of Adolescent and Adulthood Illness (IMAI) - adapted from the WHO course of public health approach to scaling up ART in resource-limited settings. Their working experience in HIV care, particularly in ART delivery, ranged from 3-8 years, with an average of 5.4 years.

Four female and six male doctors with a median age of 45 years (range 26-56 years), were also interviewed. They were all working in HIV clinics at different professional levels: four were physician specialists, each with a Master's degree in Internal Medicine, and six were non-specialist doctors, each with a Bachelor's degree in Medicine and a Bachelor's degree in Surgery. All these doctors had undertaken the two-week IMAI course. Their working experience in HIV care, particularly in ART delivery, ranged from 1-8 years, with an average of 3.2 years.

Interviewed also were three policymakers, three officials from the Uganda Nursing and Midwifery Council (UNMC) and three officials from the Uganda Medical and Dental Practitioners' Council (UMDPC) with working experience of three to six years. Other interviewees included three national ART trainers, each with four years of working experience and two regional ART coordinators, one with five years of working experience and the other with seven years of working experience. The next section presents the interview themes and their corresponding sub-themes, with illustrative short verbatim extracts where appropriate.

7.3 Themes and Sub-Themes that Emerged from the Interviews

The in-depth face-to-face interviews with the study participants revealed that facilitators and barriers to the development and implementation of effective nurse-led ART clinics are related to different environments. These environments together with nurse-level outcomes represent the themes while the numerous factors within them represent the sub-themes, as summarised in Table 7.1.

Table 7-1: Themes and Sub-Themes Identified from the Interviews with Nurses, Doctors, Policymakers, and other Stakeholders

<p>1. Patient and Community Environment Demand for nurse-led antiretroviral treatment services Community and Patients' Attitudes towards Nurse-led ART Care</p>	<p>2. Policy and Funding Environment Legislation Funding and cost implications of nurse-led ART clinics</p>
<p>3. Wider Health System Environment Job descriptions and regulations Participatory planning and stakeholder involvement Nurses' Education and Curriculum HIV in-service training course Mentorship, support supervision and feedback on performance programme Compensation of nurses who take up expanded HIV clinical roles Effect on nursing roles and profession aims Effect on other health service area</p>	<p>4. Healthcare Facility Environment Clarity of roles and effect on nursing work Manager's support Doctor's support Teamwork Clinical guidelines and protocols Tools, Supplies and Working Space Referral system Staffing levels and workload Authority and autonomy</p>
<p>5. Personal Nurse Environment Experience in HIV care Education Age Gender Altruism</p>	<p>6. Nurse-Level Outcomes Competencies Self-confidence Motivation</p>

Each of the themes and their corresponding sub-themes are presented in this chapter, starting with those related to the patient and community environment.

7.3.1 Patient and Community Environment

The current study has identified the patient and community environment theme comprised of the demand for nurse-led ART services and community and patients' attitudes towards nurse-led ART clinics as sub-themes, as a major influence on the development and implementation of effective nurse-led ART clinics.

7.3.1.1 Demand for Nurse-Led Antiretroviral Treatment Services

Some participants (6 of 26 nurses, 4 of 10 doctors, 1 of 2 regional ART coordinators, and 2 of 3 policymakers) observed that the huge number of PLHIV in need of ART coupled with the low numbers of doctors to provide this treatment was a major facilitator for the

development of nurse-led ART clinics in Uganda. They observed that in rural and poor peri-urban areas mostly, nurses were already informally involved in many ART-related activities such as patient education, prescribing medicines for acute opportunistic infections, and prescribing ART for initiation. For example, one regional ART coordinator illustrating the need for nurse-led ART clinics said, *“The huge number of PLHIV in need of ART in Uganda, with extremely few doctors, makes the nurse-led ART clinics inevitably necessary”*.

7.3.1.2 Community and Patients’ Attitudes towards Nurse-Led ART Care

Twenty-one of twenty-six nurses mentioned that the community as a whole, and HIV-positive clients, in particular, appreciated the services that nurses provided to them. They said that this appreciation motivated them to continue providing care for their clients in the face of numerous daily challenges at their workplaces. One appreciative nurse working in a rural Level IV health centre said: *“It is satisfying, a good feeling, when, during a community meeting, I am praised and thanked by the community for the good work I am doing here... Oh yes, it makes me feel very proud.”*

However, nine nurses expressed concerns about some patients whom they said were dissatisfied with nurses taking up expanded HIV clinical tasks and instead preferred doctors whom they perceived to be more educated and therefore more knowledgeable. These negative attitudes towards nurses are a significant barrier to the success of the proposed nurse-led ART clinics because they discourage nurses from taking up expanded HIV clinical tasks and can prevent patients from coming forward for nurse-led services. This concern was common among nurses already providing the whole range of HIV services. For example, a nurse from a rural general hospital HIV clinic said:

“When some clients come and find us . . . they insist on being seen by a doctor, even when it is evident that the patient does not need to be seen by the doctor, I mean a client with a common cold. These kinds of patients think that doctors are better than nurses, whatever the case.”

A nurse leader from a rural general hospital, also unhappy at being underlooked by patients said: *“I really feel bad when patients do not appreciate what we go through to help them. Instead, they insist on seeing the doctors whom they see as more skilled.”*

Furthermore, six doctors and two participants from UMDPC were concerned that patients on ART already used to nurses taking instructions from doctors rather than nurses working independently would more likely resist the nurse-led ART clinics. Indeed, twenty nurses, seven doctors, and all the three policymakers advised of the necessity of the government to involve patients and communities while setting up the nurse-led ART clinics if the design of these clinics is to take care of their concerns and thus gain their support.

7.3.2 Policy and Funding Environment

The current study has identified the policy and funding environment theme comprised of two sub-themes, namely legislation and regulations, and funding and cost implications of the nurse-led ART clinics that influence the development and implementation of effective nurse-led ART clinics.

7.3.2.1 Legislation and Regulations

Most participants (23 nurses, 9 doctors, all 3 policymakers, and both regional ART coordinators) observed that the lack of legal protection for nurses deterred many of them from taking up expanded clinical roles in HIV care. For example, a nurse from a rural Level III health centre who felt discouraged from taking up HIV clinical roles in the absence of legal protection in case of a mishap during patient care explained her dilemma, *‘We are not supposed to prescribe ARVs. There is no law to protect us if we get problems, but if we do not prescribe, then patients will die.’*

The nurses, in particular, expressed fears that regulations requiring only doctors to initiate ART for patients could land nurses in litigation trouble if their patients developed complications, noting it also as a significant disincentive for nurses to take up expanded HIV clinical tasks. For example, a nurse from a general hospital said: *"I should have the authority, power, and approval to do the job I do, and this should be clearly written out*

in the practice guidelines, which currently is not the case. So I must have it in there if I am to initiate ART confidently."

In concurrence with the previous nurse, another nurse from a Level IV health centre, arguing for well-laid out regulations expressed clearly in operational guidelines said:

"Now, nurses are expected to obey doctors' orders only, give the drugs, do the injections, monitor the vitals, and write the nursing notes, but not to intervene independently. That is what the guidelines and regulations exactly say. Nurses are expected just to obey and not to think."

While the nurses' concerns about the lack of legislation were predominantly related to their indemnity, most doctors (7 of 10) were concerned about the possible negative consequences of lack of legislation for both patients and nurses. They feared that without legislation and regulation patients could receive unregulated and unsafe services. A senior doctor from a regional referral hospital, for example, cautioned: *"It may backfire . . . There is currently no law to protect patients from unsafe services from nurses. I know some people may misunderstand us for protecting our profession."*

In agreement with the doctors, all the participants from the UMDPC and all the three policymakers recommended that the government should put in place a law that recognises nurses' essential skills and competencies in HIV care to ensure effective care and patient safety. To them, such a law should spell out the necessary requirements for nurses taking up clinical roles in nurse-led ART clinics, such as experience, training, and certification. They further said that such a law should clearly spell out which services nurses should offer and which ones they should refer to doctors. Nurses, on the other hand, argued for legislation that would safeguard them from liability and provide for their compensation if they got nosocomial infections from their workplaces.

7.3.2.2 Funding and Cost Implications of Nurse-Led Antiretroviral Treatment Clinics

All the three policymakers and six of the ten doctors were concerned about the high costs associated with the proposed nurse-led ART clinics since nurses taking up expanded HIV clinical roles would eventually demand higher salaries. They were also concerned that costs would escalate from ill-prepared nurses ordering for inappropriate laboratory

investigations, making inappropriate prescriptions, and from treating complications that may arise. Additionally, they were concerned about costs arising from capacity building activities such as training, support supervision, and mentoring of nurses taking up these new roles. For example, a doctor from a regional referral hospital expressing fears about increased costs associated with nurse-led ART clinics argued:

“Nurses will increase HIV care costs . . . Nurses being unsure of the diagnosis will resort to ordering a battery of investigations . . . This will be followed by the prescription of many medicines - I mean polypharmacy - with the hope that one of them will hit the target.”

Seven of the ten doctors were also concerned about the opportunity cost resulting from nurses seeing fewer patients because they had been found to spend longer consultation times, making them unavailable to do their routine nursing work, thus increasing the overall costs of providing HIV services.

Another concern expressed by all the three policymakers was the current overdependence of Uganda’s HIV programme on donors, whom they said financed as much as eighty percent of the HIV budget. These participants were worried that the government would find it challenging to finance nurse-led ART clinics, mentioning especially that there were already signs of donor fatigue in the country evidenced by budget cuts in their support.

On the contrary, two of the three policymakers and one of the three officials from UMDPC argued that the nurse-led ART clinics might help reduce costs associated with providing routine HIV services by having lowly paid nurses rather than the highly paid doctors offering them. An official from UMDPC, for example, argued, *“Having nurses managing HIV-positive patients will inevitably reduce the cost of providing care to them because nurses are paid less compared to doctors.”* A few nurses (3 of 26) also argued that HIV-related prescription costs could reduce because nurses prescribe strictly within the clinical guidelines, unlike the doctors whom they said always prescribe expensive medicines, which are outside the national guidelines.

7.3.3 Wider Health System Environment

The current study has identified the wider health system theme comprised of eight sub-themes that influence the development and implementation of effective nurse-led ART clinics. These sub-themes include job descriptions, participatory planning and stakeholder involvement, nurses' education, HIV in-service training, mentorship, support supervision and feedback on performance, remuneration of nurses who take up expanded HIV clinical tasks, nurse-led ART clinics' effect on nursing roles and profession aims, and their effect on other health service areas.

7.3.3.1 Job Descriptions

Twenty-one of the twenty-six nurses expressed concerns about the existing nurses' job descriptions defining their scope of practice being restrictive as they do not include HIV clinical services, thus presenting a significant barrier to nurses taking on expanded HIV clinical tasks. To them, much of the work proposed for nurses in the nurse-led ART clinics falls outside their existing job descriptions. They explained that job descriptions determine the tasks nurses have authority to perform, adding that authority is a key factor in enabling nurses to execute expanded HIV clinical tasks. However, they were concerned that their job descriptions restricted their authority to just a few HIV clinical tasks, which consequently limited their ability to think, as well as to make independent but important decisions for their patients.

In agreement with the nurses' views, both of the regional ART coordinators observed that healthcare facilities that strictly enforced what tasks nurses could and could not do as defined by their job descriptions did not always encourage nurses to take up expanded HIV clinical tasks. For example, a regional ART coordinator observed, *“Definitely, health centres that are doctor-centred and strictly enforce tasks in job descriptions for nurses will find it difficult to implement nurse-led ART clinics.”*

These nurses and regional ART coordinators advised that if the nurse-led ART clinics are to be implemented well, the Health Service Commission (the responsible government

agency) in conjunction with the UNMC, have to review and revise job descriptions and guidelines to allow the nurses take up expanded clinical roles in HIV care.

7.3.3.2 Participatory Planning and Stakeholder Involvement

Seven of twenty-six nurses and two of ten doctors complained about the top-down planning approaches used by the government, where front-line healthcare workers come to know about new initiatives during the implementation phase. These participants said that they do not always execute such new initiatives well because their concerns are not factored into their designs since they are excluded from the planning process. A senior doctor-participant from a rural general hospital expressed these front-line healthcare workers' concerns:

“The biggest problem is that we are neither consulted nor involved during the planning stage of new initiatives . . . We only come to learn about them when we are ordered to implement . . . Of course, this is very annoying, and it affects the implementation process.”

All the three national ART trainers and both the regional ART coordinators also reflected the feeling of non-involvement of some of the key stakeholders by the government. These participants believed that the government was uncritically accepting guidelines developed by international agencies and donors without adequately consulting all the stakeholders and without analysing the human resource needs to deal with the healthcare challenges of Uganda. They further observed that the lack of stakeholder involvement leads to low levels of awareness about nurse-led ART clinics, which undermines them, as they now become subject to personal interpretation, allusion, and ridicule, often done maliciously.

These participants suggested that before introducing nurse-led ART clinics, the government should carry out wide consultations with all the relevant stakeholders including PLHIV, nurses, doctors, training institutions, donors, and the ministries of health, public service and finance to get their input and buy-in. They explained that involving such stakeholders was critical because of the interdependence of human resources for health. They further explained that this interdependence results from the education sector producing the healthcare workers, the public service employing them, the health ministry using them to provide health services, and the finance ministry

paying them using money mostly from donors while the patients use the services provided by healthcare workers. A national ART trainer illustrating this thinking said: *“If this whole thing of nurse-led ART clinics is to succeed, the ministries of education, health, public service, and finance, as well as patients and healthcare workers have to be involved from the start.”*

7.3.3.3 Remuneration of Nurses in Expanded HIV Clinical Roles

Many participants (24 of 26 nurses, 4 of 10 doctors and all the 3 officials from UNMC) were concerned that the non-commensurate salaries for nurses who took up expanded HIV clinical tasks posed a significant barrier to the success of nurse-led ART clinics. Eight nurses who were already doing clinical work in HIV care complained that the lack of compensation for the extra work they were involved in had caused much discontent and stress among them and had discouraged some of their colleagues from working in the HIV clinics. One nurse from a general hospital, for example, stated, *“This lack of recognition and reward for those with extra skills and knowledge and who take on additional tasks is a potential barrier to this whole thing.”* In her support, another nurse from a Level IV health centre argued: *“Nurses are going to ask the difficult questions such as why should they bother to take on additional work in HIV care, only to end up in the same position and earning the same salary?”*

Twenty-four nurses, who were sceptical about the proposed introduction of nurse-led ART clinics, perceived them as a ploy by the government to use nurses as a cheaper option to achieve its political ends. To them, if the government used nurses to deliver HIV services including ART initiation prescription, it would claim to be providing universal access to care for HIV-positive patients, which would garner it more votes during the elections. They expressed much anger and frustration as they felt that politicians were using them for political gain at the expense of improving nurses' working conditions. For example, a nurse from a general hospital expressed nurses' general scepticism about the nurse-led initiative: *“The proposed nurse-led ART clinics are a manoeuvre by the government to avoid paying the right people to do their rightful jobs, and it wants to use us nurses as the cheaper option.”* In agreement with the nurses, nine doctors argued that the government prefers to introduce nurse-led ART clinics because it is scared of doctors who might demand higher salaries.

7.3.3.4 Nurses' Education and Curriculum

Most participants (17 nurses, 8 doctors, all the 3 policymakers, and all the 3 officials from the UNMC) observed that the current education system in Uganda does not support nurses to acquire competencies necessary for clinical reasoning. They specifically mentioned the inability of the education to build nurses' competencies to take appropriate health history, to conduct the necessary general and system examination, to order appropriate laboratory and other diagnostic tests, to interpret the results, to make a diagnosis, and to prescribe medication. To them, competencies in those areas are necessary if nurses are to conduct HIV clinical staging, diagnose opportunistic infections, prescribe for ART initiation, and manage side effects successfully should they occur.

Indeed, nurses (n=23) more than any other group of participants, specifically mentioned that the current nursing education system does not promote clinical reasoning at all. For example, a nurse from a regional referral hospital with a nursing school illustrated this thought when she asserted, *"Although nurses' education has an important role in developing nurses' clinical reasoning . . . a skill that is critical in HIV care, it is not promoted currently."* In agreement, a senior nurse leader from the UNMC said, *"The current education system does not prepare its students to be effective clinical decision-makers. Then, how do you expect them to run these HIV clinics independently?"*

Nineteen of twenty-six nurses blamed the inadequacy of clinical reasoning skills among nurses on the methods of instruction that emphasised theory at the expense of practice. They singled out for blame some nurse tutors whom they said were supposed to mould student nurses but were themselves inexperienced, which discouraged student nurses from assuming greater responsibility in independent clinical reasoning. Six nurses believed that some tutors at the nursing school thought that the best nurses should have much theoretical knowledge rather than practical clinical reasoning skills. They felt that such tutors taught their students too much theory at the expense of practical skills. They went on to explain that such tutors spend much time teaching theory on a wide range of subjects (aetiology of diseases, pharmacology, physiology, and pathology) but less than ten minutes on the practical clinical reasoning skills in a session lasting two hours. To

these participants, this results in most nurses graduating from nursing schools unable to make appropriate clinical decisions. A nurse from an urban general hospital reflected that thought: *"The student-nurses are taught much theory, but they have little, if any, the opportunity to apply what they have learnt in practice."*

Another nurse with over 20 years of clinical experience from a regional referral hospital agreed with her fellow nurse when she lamented her lack of clinical decision-making skills:

"No one ever taught me how to make an independent decision and implement it using my own conclusion, . . . you know to have that power, I was trained to give the drugs and effect doctors' orders, I was never trained to think critically and make independent decisions in patient care. I would, therefore, need much training to run an HIV clinic independently."

On the contrary, a senior nurse at a regional referral hospital, who was also a tutor at the nursing school, praised the nurses' education system, but was concerned about role models at the hospital whom she believed displayed inappropriate behaviours:

"...Our education is very good, but when these student-nurses enter the hospitals to practice, they come in contact with task-oriented behaviours displayed by hospital nurses that hinder them from acquiring independent clinical reasoning skills that are highly valued in nurse-led care."

Most participants (17 nurses, 8 doctors, all the 3 policymakers, and all the 3 officials from the UNMC) identified the need to change the nursing curricula and to develop appropriately nurse tutors' competencies and experience in clinical reasoning, arguing that an improved curriculum delivered by competent and experienced tutors would prepare nurses for more clinical roles in HIV care.

7.3.3.5 The HIV In-Service Training Course

Some participants (24 nurses, 9 doctors and all 3 national ART trainers) recognised the presence of the MoH IMAI in-service training course as a key facilitator to the development and implementation of effective nurse-led ART clinics in Uganda. They pointed out that this 14-day training programme, introduced in 2004, uses simplified and

yet comprehensive training materials and guidelines to build the competencies of low-cadre healthcare workers to provide high-quality HIV services. They explained that this course is skills-based as it combines classroom theory and clinical practice at the set-up skills stations, where the trainees can practice immediately the theory learnt in class with model patients (expert patient trainers). They further explained that this course, which also emphasises the team-based approach to HIV care, could build the competencies of nurses quickly while promoting teamwork required to provide high-quality services. Furthermore, they argued that because nurses and doctors are trained together in one course, they are presented with an opportunity to appreciate each other's roles, strengths, and weaknesses, which could foster their improved collaboration in patient care. They stressed that collaboration of nurses and doctors is a prerequisite for the development and implementation of effective nurse-led ART clinics since neither of them has the required knowledge and skills to manage HIV-positive patients independently.

However, some participants (13 nurses, 6 doctors, 2 policymakers, and 2 national ART trainers) were unhappy about the content and duration of this course. Pointing out that nurses and doctors had varied knowledge and skills in patient management, they questioned how a single course with a defined content and limited duration could accommodate these differences. For instance, the participants perceived nurses to have adequate counselling and interpersonal skills, but inadequate pharmacological knowledge, whereas they perceived doctors to have adequate knowledge in pharmacology and adequate diagnostic skills, but inadequate counselling and interpersonal skills. All this led to conflicting beliefs amongst the various stakeholders about the feasibility of teaching different professions together, with most of them acknowledging that inter-professional teaching on a joint-HIV course as done in Uganda could be problematic.

Twenty-three nurses were also concerned about the lack of clear criteria for choosing the healthcare workers to attend the training, which results in abuse as most healthcare facility managers, who are mandated to select course participants, tend to choose "their friends" to benefit from the out-of-pocket allowances provided at the workshops. They called for the introduction of training logs to keep track of all those trained to prevent re-training the same healthcare worker on the same course.

All three national ART trainers also warned against the blanket statement that all nurses are capable of undertaking the ART training and coming out as competent clinicians. They pointed out that although some of the nurses who had taken up ART prescription roles were highly motivated and exceptionally intelligent, which enhanced their capacity to deliver ART, it is not always the case for most nurses. One national ART trainer, for example, cautioned:

“A number of brilliant nurses who had very good grades at high school missed university admission due to the limited number of places. Such nurses are always eager to learn and are always the first on the course and can easily learn new skills required to provide HIV care - I mean not all nurses can.”

7.3.3.6 Mentorship, Support Supervision, and Feedback on Performance

Most participants (25 nurses, 7 doctors, and all the 3 policymakers) identified support supervision and mentorship as a critical component of capacity building for nurses to develop competencies in HIV clinical roles. However, one policymaker mentioned that although properly planned mentorships and support supervisions after the training would ensure that healthcare workers properly implement what they have learnt in class, they are mostly not done due to resource constraints. He explained that effective mentorship and support supervision, focused on the common conditions seen at the HIV clinic, would equip nurses with the necessary competencies to manage HIV-positive patients appropriately. In his words:

“Mentorship and support supervision are critical elements of our capacity building strategy for the public health ART expansion programme in Uganda, particularly as we start to think about nurse-led ART clinics, but they are not happening due to lack of resources.”

However, all the three policymakers had concerns about doctors’ negative attitude towards mentorship and support supervision, which they mentioned were hurriedly done. In agreement, six doctors gave examples of mentorship visits they had done hurriedly, and which had therefore been ineffective. Thirteen nurses also complained about poorly conducted mentorships and support supervision they had received. For instance, a nurse from a rural general hospital complained: *“As much as continuous mentorship by the*

district and regional ART coordinators is important to the success of the ART programme . . . the so-called mentors are always in a hurry to address our concerns.”

Furthermore, seventeen nurses and four doctors were concerned that mentorship and support supervision opportunities were restricted to a few donor-supported health centres. They noted that the few times mentorship visits are done at a public sector health centre without donor support, they are irregular, not well integrated within the capacity-building plan of the MoH, and do not immediately follow the training. They argued that this makes it almost impossible for nurses in new HIV clinical roles to concretise the knowledge learnt in class, causing safety problems for patients.

Related to the mentorship and support supervision programme, mentioned by twenty-one nurses, was the importance of feedback on performance in building nurses' competencies and self-confidence to execute expanded HIV clinical tasks. They explained that although currently lacking, feedback on performance could give nurses in expanded roles an opportunity to discuss and confirm the correctness of their assessment and prescription decisions, particularly at the beginning of their new roles in HIV care when their competence and self-confidence was still very low. Indeed, all the five nurses who worked at ART clinics with external donor support and where mentorship, support supervision visits, and feedback on performance were happening on a consistent and regular basis reported that they were more confident in providing HIV services including ART initiation prescription. They attributed their confidence to the HIV in-service training programme and to the timely and continuous supportive feedback on their performance that they received from their mentors. They shared experiences of their mentors helping them to identify problem areas in their HIV clinical work, analysing the problems in detail, and coming up with some possible solutions. To these nurses, mentors' support empowered them and their teams to try out changes one at a time to solve their problems before acting accordingly. They explained that if the tested change solved the problem, they adopted it and recommended it for implementation. If it did not solve the problem, it was discarded or modified and re-tested. They further said that the process of testing continued until they found an appropriate solution to the problem. A senior nurse from a donor-supported ART clinic claimed:

“The MoH ART training is excellent in providing nurses with knowledge and skills in HIV care . . . You know it has practical skills stations and is immediately followed up with mentorship . . . with mentors working with you to address the challenges you face . . . This kind of programme has helped my colleagues and me a lot.”

All the officials from UMDPC and UNMC and all the three policymakers pointed out the need for an effective support supervision and clinical mentoring programme to be part of the continuum of education offered to help nurses in expanded HIV clinical roles acquire the necessary competencies in expanded HIV clinical tasks. These participants reasoned that this would be necessary because nurses have less training to prepare them for high levels of decision-making required to manage HIV-related disease conditions when compared to doctors. They recommended that the government should plan for support supervision and mentorships conducted by skilled and motivated doctors. The nurses particularly suggested the need to institute case review meetings and monitoring systems, to enable nurses in expanded HIV clinical roles to get feedback from senior colleagues, which would enhance their competencies and confidence in HIV care.

7.3.3.7 Effect of Nurses’ Expanded HIV Clinical Roles on Nursing Roles and Professional Aims

Twenty-two nurses were unhappy with the notion that the proposed nurse-led ART clinics were going to remove nurses from performing nursing work to performing what they called medical work. They believed that it was being done for selfish reasons as a temporary solution to the acute shortage of doctors. Fourteen nurses, who claimed that they did not want to fall into the pattern of some doctors providing only technical care at the expense of holistic patient-centred care, emphasised the importance of talking and listening to patients’ concerns, which they believed was not only critical in deciding the correct management plan but also in facilitating the healing process of patients. For example, a nurse from an urban general hospital illustrated this feeling: *“It is painful to know that nurse-led ART clinics are being proposed to stop us from doing nursing work, which is about caring holistically, as opposed to medical work which is impersonal . . . moreover, it is also being proposed mainly to save doctors’ time.”*

Eight nurses, all seniors with more than ten years of work experience, were not happy with the view that doctors were shifting their work to nurses, and the fact that only simple tasks would be appropriate for them. They argued that this tendency reinforces the perception by doctors that nurses only filled in to perform routine tasks that required less skill and only when doctors were in short supply. They complained that most of the proposed tasks for nurses were related to patient pre-assessment and education, but not to decision-making. They observed that nurses had already undertaken a variety of HIV clinical tasks for many years, even though they were not often recognised. These nurses advised the government to plan well and use rational approaches that avoid piling many routine tasks on nurses, who could bring many skills to HIV care. They also requested the government to introduce the post of Nurse Clinician in HIV care formally so that their role is developed while ensuring that the fundamental nature of nursing culture as a profession is not lost.

7.3.3.8 Effect of Nurses' Expanded HIV Clinical Roles on Other Health Service Areas

Sixteen nurses expressed disappointment that some of their colleagues had been attracted to HIV clinical work, in preference to their core nursing work and values. They cited examples of intensive care nurse specialists who had taken on HIV work at the expense of their work, arguing that it could undermine the health system's capacity to provide a wide range of services often needed by patients. To them, it was much easier to interest and train other nurses for HIV work than it was to train them for intensive care nursing. One nurse from a regional referral hospital who reflects this sentiment commented: *"It is unfortunate that some of our colleagues who are highly specialised, say in intensive care nursing, now prefer HIV work to their area of specialisation"*.

Similarly, two policymakers and all the officials from UMDPC and UNMC expressed concerns about the negative effects of the government focusing on only HIV for the task shifting initiative when the country had many other health problems such as malaria. They observed that if not well implemented, nurse-led ART clinics could move nurses away from other critical service areas such as antenatal and immunisation clinics to HIV services with undesirable results. For example, an official from the UMDPC reflected

this sentiment: *“What shall we benefit as a country if we save all those people living with HIV but lose patients to malaria?”*

These participants advised that the government should develop a comprehensive policy on task shifting that covers all priority disease conditions in the country and should avoid focusing on only HIV services.

7.3.4 Healthcare Facility Environment

The results revealed teamwork, doctors’ support, managers’ support, clarity of roles and responsibilities in HIV care, the effect of nurse-led ART clinics on nursing work, HIV clinical guidelines and protocols, tools and physical environment, referral system, and staffing levels and workload as sub-themes under the healthcare facility environment theme.

7.3.4.1 Teamwork

Seventeen of the twenty-six nurses and both the regional ART coordinator-participants argued that if the proposed nurse-led ART clinics were to succeed, the team-based approach to clinical work had to be emphasised and encouraged from the very beginning. These participants described numerous advantages with the team-based approach to HIV care, noting that teams could enhance creativity, improve clients’ and healthcare workers’ satisfaction, increase healthcare workers’ skills, boost the speed of working, act as sounding boards, and offer support to all members. The nurses, in particular, argued that what worked best in the patient's interest was that each member of the team recognised their limitations to practice and involved a more appropriate member of the team when required. More than the doctors, nurses mentioned that a collegial and respectful relationship with other healthcare workers was critical in providing chronic care, since no single professional group, doctors inclusive, could claim to have all the necessary skills required to provide the full range of comprehensive care services often needed by PLHIV, particularly those on ART.

According to these nurses, when nurses, doctors and other healthcare professionals worked together, they availed a wide range of skills to the team, which could be utilised to deliver extraordinary results for their patients. Furthermore, while it was true that doctors brought unique skills to the team, particularly those of interpreting laboratory results and making complex diagnoses, nurses were critical in providing holistic care, including patient education, which prepared clients for the lifelong adherence to their HIV medication. A nurse from a small Level III health centre who agreed with that argument said, *“Even the best-qualified doctor cannot have all of the skills to do all that is necessary and required by patients in HIV care.”*

On creativity in teams, one nurse leader said:

“We all have different skills, knowledge, and personal attributes. All of us bring these different talents, qualities, and ideas to the team, thus, generating solutions that are more creative, which leads to better results for our clients.”

All the eight nurses who were working in healthcare facilities participating in a USAID-funded MoH quality of care initiative supporting government and private health centres to improve the quality of services they provide to PLHIV shared their experiences. They said that the team-based approach emphasised by the initiative had helped nurses taking up expanded HIV clinical roles to provide high-quality services. To these participants, because of the quality of care initiative, some of the nurse-led ART clinics had at times performed better than the doctor-led ART clinics on many clinical indicators, citing the MoH national HIV surveillance and monitoring report to confirm their statements. A nurse from a rural Level IV health centre that had benefited from the quality of care initiative emphasised the need for teamwork saying:

“Teamwork is critical if the nurse-led ART clinics are to succeed . . . one nurse may excel at coming up with new ideas; others love the detail of understanding the patients’ problems while there are those that focus on the big picture, there are yet others who are hands-on when it comes to implementing an agreed plan.”

Twenty-three nurses observed the need to work with, consult with, and learn from experienced doctors, particularly during the early stages of these clinics. Further, they mentioned that nurses need to work with other healthcare workers, including other

nurses, to help with other routine clinic tasks, such as retrieving patients' files, filling in patients' records, calculating ART adherence levels, and taking the vitals such as temperature and weight.

A nurse from a general hospital who appreciated teamwork, said:

“We have an inspiring HIV clinic, and we do make a difference. Teamwork is what it is all about. The doctor in this clinic is willing to listen to our suggestions and will change the patient management plan . . . I love working here . . . I feel the relationship between nurses, doctor, and management is quite good. There is much respect for one another. The doctor looks to us for guidance in managing patients with adherence problems quite often.”

However, twelve nurses noted that it would not always be easy to work in teams since some hostility existed between some doctors and nurses who took up clinical roles in HIV care on the one hand and between these nurses and other nurses on the other hand. They mentioned some nurses not willing to take orders from fellow nurses, as well as some doctors who felt that nurses had to take doctors' orders rather than to act independently as indicators of this hostility.

Furthermore, the nurses from levels III and IV health centres, in particular, reported that in most cases, they had more experience in HIV care than the newly qualified doctors and did not always find it useful to consult them, which led to tension because the novice doctors became uncooperative whenever nurses did not consult them. For example, a nurse from a Level IV health centre complained:

“These newly graduated doctors may deliberately decide to do the opposite to reaffirm their dominant position, even when they know that the suggestion from the nurse is actually the best for the patient.”

Eleven nurses further emphasised the importance of teamwork by expressing doubts about the ability of doctors, particularly those not working specifically in the HIV clinic, to remain up-to-date on important HIV care issues. They complained that the doctors, especially those who did not want to work in collaboration with nurses, did not always notice important patient-related aspects, which could lead to adverse events for the patient, such as the patient developing resistance resulting from poor adherence to ARV

medication because the doctors had not counselled them well. To them, those complications were avoidable if the doctors worked as a team with the nurses. One nurse from a general hospital, advocating for teamwork, recounted her experience of working with a doctor:

“I see things in the file that the doctor has simply disregarded and then I think about patient readiness or an immune reconstitution reaction if the patient has a quiet opportunistic infection in there . . . things that just do not interest them, or they have just passed over the patient to the pharmacy for medicines, things that could have been avoided if we worked as a team.”

7.3.4.2 Doctors’ Support

Doctors’ support for the proposed nurse-led ART clinics came out prominently as critical during the interviews with nurses, doctors, and other key national-level stakeholders, since doctors would take on the difficult cases that nurses would refer to them. Furthermore, they argued that doctors would work with and mentor nurses, particularly at the beginning of their new roles in HIV care. However, as already alluded to in the discussion on teamwork, nurses held mixed feelings about how doctors might receive nurses’ new clinical roles in HIV care, with eight of them arguing that doctors might not support the notion of nurses taking up expanded clinical roles in HIV care, particularly the role of ART initiation prescription. However, fourteen nurse-participants felt that doctors were already supporting them to take up clinical roles in HIV care.

Those nurses, who expressed concerns about doctors’ unwillingness to support them, believed that doctors did not trust nurses’ competencies in diagnosing diseases, and subsequently in prescribing medicines, and would therefore not support nurses to assume these roles. They further noted that the doctors lacked information and knowledge about the policy developments around nurse-led ART clinics, which hampered their support for the initiative. In addition, some nurses felt that some doctors feared to lose their medical superiority status in society, as the only ones with knowledge and skills to prescribe ARV medicines.

The nurses’ concerns about getting little or no support from doctors were confirmed in interviews with doctors, with four of the ten doctors interviewed condemning the

proposed nurse-led ART clinics initiative for fear that society would undermine them. These doctors argued that as far as the public was concerned, prescription of medicines, particularly ARVs, was what differentiated doctors from nurses in HIV care delivery. For example, a sceptical doctor from a rural general hospital against nurses prescribing ART said: *“Why should people spend many years in medical school if anyone can do a doctor’s job? There are things that have always been done by doctors, and we had better keep it like that. How will the public then differentiate nurses from doctors?”*

A senior doctor from a regional referral hospital agreed: *“If anyone can prescribe ART, then why do doctors spend six years at medical school, spending sleepless nights and studying all these abstract concepts? I mean this whole thing of nurse-led ART clinics makes no sense to me.”* In conclusion, a doctor from a Level IV health centre said, *“The doctors’ profession will suffer when nurses start doing small bits and pieces from our area of work.”*

In fact, seven doctors were concerned about patients’ safety if nurses initiated ART. One doctor from a regional referral hospital reflecting this general feeling said, *“I am extremely concerned about the safety of our patients, the HIV in-service training provided by MoH to nurses does not in any way come to the six years training that doctors have undertaken.”*

Two doctors went further and advised that for nurses to deal directly with undiagnosed diseases in PLHIV and to prescribe medicines, they would need to undergo training similar to that of doctors. In so doing, they would be appropriately recognised and rewarded for the tasks they would be executing. A senior doctor from a rural general hospital argued:

“While I am confident about the ability of suitably trained nurses to conduct patient follow-up visit reviews and at the worst do repeat prescriptions, I believe that only doctors have the necessary medical training and therefore competencies to safely initiate ART for PLHIV.”

Additionally, three doctors felt that the nurse-led ART clinics driven by cost-minimisation plans rather than by adequate scientific evidence, undervalued medical training and the multifaceted expertise doctors had, and would eventually result in adverse effects on patients. For example, a senior doctor from a regional referral hospital argued: *“It is madness, dangerous for patients; this moving to a purely nurse-led service would be a backwards step in HIV care provision.”* Five doctors also thought that the nurse-led ART clinics could limit patients’ right to quality care and raise many ethical questions. They argued that while they were not against the principle of nurses taking on extra clinical work in HIV care, they were concerned about the safety of the patients.

However, despite the negative sentiments expressed by some doctors, most of them (9 of 10) believed that nurse-led ART clinics could work if medical authority in decision-making were maintained, particularly for complicated cases. Indeed, three doctors acknowledged that nurses were competent and thus effective in carrying out their work, and had saved many lives, including those of PLHIV.

7.3.4.3 Managers’ Support

Nineteen nurses mentioned that managers’ support was critical for the successful implementation of nurse-led ART clinics. They specifically talked about managers with excellent interpersonal skills, enthusiasm, and motivation, as a significant driving force behind the successful implementation of the nurse-led ART clinics’ initiative. These nurses wanted their managers to provide to them with emotional support, medical supplies, opportunities for financial supplementation, time and the opportunity to attend in-service training, time and opportunity to work in HIV clinics and opportunities to contribute their ideas and opinions in decision-making. They considered those areas of managers’ support vital ingredients for the success of these clinics.

Seventeen of the twenty-six nurses repeatedly mentioned that HIV clinics had high patient loads, often presenting to medical staff with various complications, which translated into a stressful work environment. Under such stressful conditions, nurses considered managers and other colleagues a useful source of emotional support. However, to their disappointment, these nurses did not think that their managers

supported them adequately. They perceived their managers' unsupportive behaviour as a significant barrier to the effective running of these clinics, as depicted by one nurse from a rural general hospital, who was dissatisfied with the untenable situation at her workplace: *"I have felt frustrated many times . . . When I have needed to be supported by my manager, she has not supported me."* Indeed, nurses cited examples of nurse-led ART clinics that had collapsed when a good manager transferred to another clinic or moved to another job.

Although some nurses (8 of 26) were aware that their managers were not responsible for providing financial rewards to them, they referred to their unfulfilled financial needs as a clear illustration of a lack of managers' support. These nurses believed that managers had the option of supplementing their income through sending them to workshops and for other off-station activities that attracted allowances.

Additionally, most nurses (21 of 26) mentioned that although it was their managers' responsibility to provide them with medical supplies (such as gloves, disinfectants, injection, and dressing equipment), they did not always supply them, which was a primary source of demotivation as it made their work tough. To those nurses, that clearly indicated that their managers did not support, which posed a major barrier to the successful development and implementation of the proposed nurse-led ART clinics.

Furthermore, nineteen of the twenty-six nurses expressed frustration at the failure of their managers to allocate nurses time and opportunity to work in the HIV clinic. They gave examples of frustrated colleagues who had undertaken training in HIV care and were willing and ready to work in the HIV clinic, only for their managers to allocate them other work, such as theatre work. According to these nurses, the lack of time and the opportunity was not only caused by high patient loads but also by their managers' lack of appreciation of HIV work as part of the services to be provided by the healthcare facilities. These nurses attributed the managers' lack of interest in HIV work to the vertical way in which the MoH introduced HIV services. They believed that because their managers did not appreciate HIV services, they were reluctant to assign nurses to work in the HIV clinics. They pointed out that in some healthcare facilities, managers

did not assign them to the HIV clinic altogether and that some nurses only went to work there voluntarily whenever they were off-duty, because of their personal interest to help patients out. Some nurses (5 of 26) explicitly complained that that kind of situation, which rendered them unable to have control of their work at the HIV clinic, would seriously impede the smooth running of nurse-led ART clinics. One nurse, for example, reflected the common feeling among the nurses interviewed: *“Our managers need to give us time and the opportunity to work here at the HIV clinic . . . How then will the nurse-led HIV clinics work?”*

Twenty-two nurses also felt that when conflicts between nurses and other colleagues arose at the HIV clinic, their managers supported the other cadres rather than the nurses. They felt that this lack of support during conflicts discouraged and demotivated nurses from taking up expanded HIV clinical roles, particularly, if those roles caused conflict. One nurse from a rural general hospital who illustrated this situation, lamented, *“There is no one listening to our story . . . the sufferings we go through every day. The healthcare facility in charge never supports us.”* In agreement, a senior nurse at a regional referral hospital complained: *“If there is a conflict between nurses and other cadres, the senior nurse manager supports the others rather than the nurses.”* Lastly, some nurses (4 of 26) were frustrated that their managers did not seem to consider nurses’ ideas and opinions as important, which could be a barrier to nurses’ effective participation in the smooth running of the HIV clinics.

The nurses advised that while planning the introduction of the nurse-led ART clinics, the MoH should institute measures to safeguard against gaps in management by training health centre managers in management. Furthermore, they recommended that the MoH should put in place mechanisms to encourage joint-management and succession planning.

7.3.4.4 Clarity of Nurses’ Roles in HIV Care

A nurse working in a busy HIV clinic at a general hospital stated: *“When what is expected of you by your manager is clear and well written, you have a sense of control*

and understanding of your work, and you devise ways of doing it very well, and you are actually happy doing it.’’

Similarly, nineteen nurses echoed this thought when they pointed to the need for a common understanding of everyone's role expectations by all members of the healthcare team. They argued that when roles were unclear, as was the case with nurses' roles in HIV care, then role ambiguity set in. They believed that nurses were neither sure about their roles at the HIV clinics nor what others in the team thought they should be doing.

I considered this sense of understanding of nurses' work and what was expected of them in HIV care to be best captured by role clarity, the extent to which nurses' roles and responsibilities in HIV clinics were well communicated and well understood by all the concerned stakeholders. I noticed that nurses' complaints about the absence of clearly written and communicated nurses' roles and responsibilities in HIV care had left many of them frustrated. I also noted that their explanation for this frustration resulted from not knowing precisely what their managers expected of them in HIV clinics. I further noted that the lack of clarity about nurses' roles and responsibilities had led to the preoccupation of most of them with administrative and other non-nursing work often required of them by their healthcare facility managers. To them, this lack of clarity of nurses' roles and responsibilities in HIV care would be a major obstacle to the successful development and implementation of the proposed nurse-led ART clinics, if not well addressed.

A nurse from a regional referral hospital reflected the nurses' plight below:

“The government does not want to define clearly the role of nurses. They do not want to employ other cadres because they know that nurses are there to do all the donkeywork in addition to nurses' work. Then what is the role of the nurse in HIV care? We do not have clear responsibilities.’’

In her support, a nurse from a general hospital added:

“What is nurses' work in the ART clinic at the moment? It is not clear . . . Because nurses' roles are not clear... heaps of small tasks

trouble us . . . Most of us do not have time to provide psychological care, implement health education and monitor patients' condition. We cannot do them now . . . We are not the nurses we trained to be. All sorts of responsibilities are given to us. Therefore, much nursing work is left undone.'

Seven nurses also related their inability to carry out important tasks such as patient education and psychosocial and emotional support, which they had been trained to do, to lack of clarity of nurses' roles and responsibilities in HIV care. They believed that their managers did not allocate them time to provide these services because they did not quite understand nurses' roles in HIV care and regarded such tasks as 'wasted time' if nurses undertook them. For example, a nurse from an urban Level IV health centre complained: *"Because my roles at the HIV clinic are not clear to my manager, he allocates me lots of paperwork, and I spend more time than is necessary filling in registers and making monthly reports to the ministry. This results in too much work for me to be effective."*

The nurses believed that because of role ambiguity, they spent less than thirty percent of their time doing technical work in the HIV care clinic and the rest, on work they felt less-trained people could do.

Eleven nurses recommended that the government should clearly define the roles and responsibilities of nurses taking up expanded HIV clinical tasks in the nurse-led ART clinics and communicate these roles well to all concerned stakeholders, including healthcare facility managers.

7.3.4.5 HIV Care Clinical Guidelines and Protocols

All participant groups recognised the importance of having in place clear guidelines and protocols in HIV care in enabling nurses to execute expanded HIV clinical tasks at nurse-led ART clinics. Twenty-two nurses reported that they always made prescriptions following national guidelines. One nurse from a rural Level IV health centre who appreciated the role of guidelines and protocols said, *"I feel safe working within the guidelines. In that way I am sure . . . the procedures are very clear, and that is good."*

All the doctors and national ART trainers argued that they expect nurses to use the guidelines and protocols at all times when prescribing medications for PLHIV to give them direction in their new expanded clinical roles because they believed that nurses had limited clinical competencies. The regional ART coordinator and the national ART trainers also suggested that nurses' clinical accuracy in providing HIV care would have to be measured against standards and guidelines to safeguard patients against possible error resulting from nurses' limited knowledge and skills in HIV management.

There was a general perception by participants (4 doctors, 22 nurses, all 3 officials from UMDPC, and all 3 policymakers) that nurses might offer an acceptable quality of HIV services, including ART initiation prescription if they follow guidelines. These participants reported that HIV care in Uganda was a highly standardised and protocol-driven programme, and that nurses more than doctors would strictly follow clinical guidelines, which would ensure the provision of quality services. However, they were concerned that government did not always “*walk the talk*”, as illustrated by one doctor: “*Today the government says it is going to implement this in a particular way, then down the road, you find that the nurses are on their own with no doctors to consult, and with no current guidelines to refer to when faced with complicated patients.*”

However, all the nurses and doctors were concerned that the general absence of guidelines in their healthcare facilities limited the quality of services provided by nurses. They mentioned instances where guidelines had been developed and widely disseminated, and had resulted in the successful implementation of those programmes. Indeed, nurses frequently cited how well disseminated guidelines on the prevention of mother-to-child transmission of HIV had helped them to provide these services at the lowest Level III health centres. Twenty-one nurses and two doctors, named one or more national HIV guidelines they referred to when prescribing for patients. In particular, nurses talked about how they used the Acute Care guidelines to make informed decisions when prescribing medication for opportunistic infections in HIV-positive patients. A nurse working in a nurse-led ART clinic at a Level IV health centre underlining her adherence to guidelines said, “*I stick to guidelines all the time . . . I cannot prescribe*

something if it is outside the guidelines. I know I have to prescribe within the guidelines basically.”

Six doctors were doubtful about nurses' decision-making capabilities in HIV care, saying their decisions were always directed by guidelines and protocols. The doctors wondered what would happen, as it usually did when a patient could not be managed by the protocol. One doctor from a rural Level IV health centre expressed doubts about the appropriateness of following guidelines for all patient conditions: *“You will find times when you cannot use the guidelines for all your patients and you have to use clinical judgement. I wonder what nurses do when they come across such patients!”* Another doctor from a general hospital also agreed: *“I check the guidelines, but not every patient fits into the guidelines.”*

Contrary to the doctors' thinking, seventeen nurses felt that most of the HIV-positive patients were manageable within the available guidelines and protocols. Only two nurses commented on situations where patients did not fit within the guidelines and therefore considered it inappropriate for nurses to prescribe for those patients.

Most participants (22 nurses, 8 doctors, and 2 policymakers) suggested that the GoU should develop and disseminate clear-cut guidelines and protocols to all nurse-led ART clinics if they are to be successfully developed and implemented. The doctors, in particular, suggested that nurses would need experience and training to recognise when the guidelines and protocols were not appropriate for managing certain patients.

7.3.4.6 Equipment, Supplies and Working Space

Most participants (21 nurses, 7 doctors, 2 national ART trainers and 2 policymakers) complained about the general lack of communication facilities, laboratory facilities, working space, medicines, clinical equipment, ambulance, referral systems, and medical supplies, which they said were necessary for the optimal provision of HIV services. Nurses in particular (21 of 26), emphasised the importance of developing the nurse-led

ART clinics together with an enabling work environment to aid nurses in decision-making.

(i) Communication Facilities

Nurses, in particular, cited challenges of consulting with doctors when faced with difficult patients because of the lack of communication facilities like telephones and internet services. This lack of communication facilities was noticeably common in rural health centres where the proposed nurse-led ART clinics are likely to be located. For example, a nurse described her frustration with the lack of communication facilities at her health centre: *“Sometimes you get very complicated patients, and you want to consult the doctor . . . however, there is no telephone around here . . . I really get very disturbed with this because I am stuck and can do nothing.”*

(ii) Laboratory Facilities

Twenty-three nurses and six doctors, from HIV clinics, stressed the importance of having a functioning laboratory on site to support nurses taking up expanded HIV clinical roles to make correct diagnoses as well as monitor patients on ART. They mentioned tests such as CD4 count cell estimation, haemoglobin level estimation, and liver and renal function tests, as critical in the management of HIV-positive patients. They considered monitoring patients’ CD4 cell count levels critical because it helped the healthcare worker to determine if a patient was eligible for ART. They explained that CD4 cell count tests also helped them to determine if ART was working or not, arguing that if the patient’s CD4 cell count levels increased, then it would be an indicator that the ARVs were working well. These participants further explained that nurses in their new roles, more than doctors, would need more laboratory support because doctors who had better clinical skills could manage ART clients using clinical signs without necessarily carrying out numerous laboratory tests. A nurse from a rural Level IV health centre argued: *“If the CD4 testing facilities are unavailable, as is the case currently . . . It will be difficult for us to decide when to initiate antiretroviral treatment and to know if the treatment is working or not.”*

These participants suggested that the GoU should put in place laboratory facilities at health centres with nurse-led ART clinics to enable nurses to manage their patients well.

(iii) Working Space

Because the nurse-led ART clinics would most likely be located in remote areas with substantial infrastructure limitations, most doctors and nurses (22 nurses and 6 doctors) felt that inadequate space would adversely affect their proper functioning more than doctor-led clinics that are based at big hospitals. Indeed, only four of 18 clinics visited during this study had private rooms designated for counselling and examination. In fact, these participants believed that patients were likely to shun the nurse-led ART clinics if they were introduced at healthcare facilities with limited space, which would not ensure patients' privacy and confidentiality. All the twenty-six nurses, in particular, complained about overcrowded HIV clinics, which they said, were often located in one room, leading to haphazard patient flow and increased waiting times. They warned of the dangers of nosocomial infections in such overcrowded and poorly ventilated environments. To ensure that nurse-led ART clinics function optimally, the participants advised the GoU to remodel or construct extra rooms for the HIV clinics.

(iv) Availability of Medicines

The nurses and doctors, who were from the rural-based lower level healthcare facilities (8 of 13 nurses, 3 of 5 doctors), complained about the frequent shortage of medicines for opportunistic infections and the occasional stock-outs of antiretroviral medicines that often occurred at their facilities. Furthermore, fourteen nurse-participants complained that the essential drug list defining the medicines supplied by the National Medical Stores for the different health centre levels limited the variety of medicines available at lower-level health centres and thus restricted nurses' ability to treat a wider range of opportunistic infections. The participants were concerned that this shortage of medicines would affect the proper functioning of the nurse-led ART clinics because nurses would make unnecessary patient referrals to hospitals where they could access the medicines. These participants recommended that the GoU should continuously make available all the medicines and expand the essential drug list for lower-level health centres to ensure the proper functioning of nurse-led ART clinics.

(v) Medical Equipment and Supplies

The scarcity and inadequacy of medical equipment and supplies were the other major concerns raised by fourteen nurses as negatively affecting their work at the HIV clinics. They complained about their inability to provide quality care to their patients resulting from the absence or poor quality of supplies (gauze, plasters, and disposable syringes) from the National Medical Stores. These nurses also complained about the lack of basic equipment, mentioning weighing scales, blood pressure sets, and thermometers, but emphasising the lack of weighing scales to take the patient's weight. They explained that it was almost impossible to manage HIV-positive patients on ART without knowing their weights, which they argued was useful in determining proper medicine dosages and necessary in monitoring their response to treatment. They clarified that a steady increase in the patient's weight meant that the ARVs were working well, while the continued loss of weight indicated that there could be a problem. A nurse from a rural Level IV health centre, illustrating the challenges caused by the scarcity of medical equipment and supplies said: *"I highly doubt if the proposed nurse-led ART clinics will succeed . . . I know these clinics will mostly be located in the small remote health centres with no basic equipment like weighing machines, let alone essential supplies."*

The nurses observed that if the scarcity and inadequacy of medical equipment and supplies were not rectified, the proposed nurse-led ART clinics would not function properly.

(vi) Referral System

Most participants (22 nurses, 7 doctors, both regional ART coordinators, and all 3 policymakers) believed that the successful development and implementation of effective nurse-led ART clinics would largely depend on having a good referral system in place. They explained that an effective referral system should start at the nurse-led ART clinic and extend upwards to the general hospital or beyond, depending on the patient's needs. These participants argued that through an effective referral system, complicated patients seen by nurses could be referred to higher levels, with doctors specialised in HIV care and with specialised diagnostic equipment. The nurses, in particular, mentioned their frequent frustration whenever they received complicated patients who needed urgent

referrals. They attributed their frustrations to the absence of transport for patients, or to the absence of a next functional point of referral lacking doctors or appropriate diagnostic equipment required to manage the patients. For example, a nurse from a rural Level IV health centre described a scenario she had always encountered:

“Usually I refer patients for either CD4 count tests, or liver function tests, or renal function tests, or for more specialised care in case of ART treatment failure, but the patients usually return saying the machines were faulty, or the doctor concerned was unavailable. It is frustrating, very discouraging . . . I tell you if this is not worked on, those nurse clinics will fail before they start.”

Seven nurses and three doctors further advised that every patient referred upwards from the nurse-led ART clinic needed to be accompanied by a written record of the findings, the questions asked, any treatment given, specific reasons for referral, and the expectations of the referring nurse. Such communication had to accompany the patient and needed to have a clear designation of which healthcare facility the patient had been referred to. They added that once the patient had received attention at the higher-level healthcare facility, back referral to the first clinic was of vital importance. The back referral communication needed to contain answers to the questions posed by the referring nurse with specific findings, and mention the special investigations done, the results of the clinical examinations and investigations, the diagnosis made, the treatment offered, and the follow-up expected from the nurse.

However, the nurses noted that communication mechanisms for referral were non-existent in most primary health centres. They singled out the referral form that did not facilitate communication in both directions as a major limitation to effective referral of patients by nurses. A nurse from a rural general hospital, for example, presented this referral shortcoming:

“This to-and-fro exchange of information about referred patients is currently not possible and will be a major barrier. Because the patient is moving between different service providers, there needs to be proper communication that accompanies them in both directions. Upwards, describing the problem as seen by the nurse and requesting specific help. Importantly, information downward to the nurse describing the findings, which actions were taken by the doctor, and the follow-up needed . . . is lacking.”

All the three policymakers suggested the need for mentors to assess the appropriateness of the nurse's decision to refer by regularly reviewing all referrals. They emphasised that the mentor should also discuss with the nurse the back referrals to determine whether the nurse is acting upon the recommendations of the doctor. They explained that these discussions stimulate and reinforce the transfer of knowledge and skills from the mentors to nurses and are an important form of capacity building, which can enable nurses to gain progressively clinical reasoning skills. They further mentioned the lack of ambulances as a critical concern causing referral difficulties since they could not transport patients who developed complications requiring management at higher-level healthcare facilities.

Nineteen nurses noted that the absence of transport to refer patients in need and the lack of telephones to consult doctors on difficult patients were major barriers to guaranteeing patient safety in nurse-led ART clinics. A nurse working in a rural Level IV health centre depicted this scenario:

“At times, you get a patient with many complications . . . you do not know what next to do for this patient. When you refer . . . the patient just cries . . . ‘No transport’. Then, you somehow have to treat. You are disturbed, wondering if the treatment you have prescribed is safe.”

The participants advised that the government should integrate an effective referral system into the design of the nurse-led ART clinics to be able to manage patients who develop complications.

7.3.4.7 Staffing Levels and Workload

Almost all the nurses (24 of 26), more than any other group of participants, believed that appropriate staffing levels are crucial to the successful development and implementation of nurse-led ART clinics. They cautioned that transferring HIV tasks such as diagnosis and prescription of medicines from doctors to nurses without a corresponding increase in the number of nurses would have severe negative effects. They explained that the severe shortage of nurses was already creating difficulties in providing other essential health services like immunisation, let alone in the provision of standard HIV quality care, such as adequate adherence counselling services for PLHIV. They argued that over time, nurse shortage coupled with excessive work had caused disinterest in working altogether. A nurse from a Level IV health centre lamented her work overload, saying:

“I am the only qualified nurse in this health centre and I am required to run the antenatal clinic, the under-five clinic, the maternity ward, the medical ward, the paediatric ward . . . This leaves me no time to meaningfully run the HIV clinic which requires a lot more time counselling and talking to patients.”

In agreement, another nurse, also from a Level IV health centre said:

“On a typical day, I see forty and sometimes up to sixty patients, all by myself. I know that I provide merely routine patient care devoid of attention to individual needs of patients. I have no time to think and make those important clinical decisions, and I know this will create complications for my patients.”

Nurses already working in clinics with high patient loads complained that additional work had caused them much emotional suffering including stress and burnout. They cited examples of some of their colleagues who had become demotivated and lost interest in HIV work because of the heavy work involved. They attributed this increasing demotivation and disinterest to take on tasks of others to the heavy workload at HIV clinics.

A nurse from a small rural Level III health centre painted a grim picture of what would happen if they gave them more work at their clinic:

“We are already stretched beyond limits; we are only two nurses here, and we see over seventy patients every day. We have been having an excuse of not treating PLHIV, who require ART, preferring to refer them, with a reason that we do not have a doctor on site to initiate them on ART. Now, you are saying that we are going to initiate! Who is going to do that added work that is going to come with it?”

One nurse from an urban Level IV health centre described the debilitating effects of work overload on her:

“One suffers exhaustion . . . heaps of things you continuously feel you should be doing, looking after the patient, you have to write in the patient cards, you know, document. It is a lofty load. You are now talking about adding ART initiation; I do not sense I will be productive anymore; I am bored, burnt-out, and tired.”

Surprisingly, twenty-one nurses did not appreciate much the role of lay providers in HIV care. Most of them thought that although lay providers such as PLHIV helped with routine clinic tasks like patient education, retrieving of patient files, and packing of

medicines, they created additional work for nurses because they had to supervise them closely to ensure that they carried out these tasks well. For example, a nurse from a general hospital said: *‘‘If lay providers are performing HIV counselling and testing, then I must establish regular meetings with them so that I can observe and supervise them to make sure they do well, and that is more work for me. So they really don’t help that much.’’*

These nurses suggested that the GoU should consider recruiting more nurses and further decentralising HIV services to lower-level health centres while planning to introduce nurse-led ART clinics. They reasoned that this would result in sharing of patients among many healthcare facilities, subsequently reducing patient loads in individual HIV clinics. They further recommended that more nurses and other healthcare workers should take over the routine nursing work including, but not limited to, running of antenatal care clinics, immunisation clinics, and under-five clinics. In agreement with the nurses, eight doctor-participants and all the three policymakers noted the importance of recruiting competent healthcare workers across all cadres including nurses, as well as proper personnel planning and organisation as a prerequisite to the successful development and implementation of the nurse-led ART clinics. A policymaker, for example, argued: *‘‘For nurse-led ART clinics succeed and provide acceptable quality HIV care, they must have adequate numbers of competent healthcare workers across cadres.’’*

Thirteen nurses and six doctors as well observed that if the government employed all the available unemployed healthcare workers, including doctors and nurses, the need for the nurse-led ART clinics would not arise. They further advised that the government should employ data clerks to carry out the administrative tasks, to provide nurses more time for clinical work in HIV clinics.

7.3.4.8 Authority and Autonomy

This study has identified numerous factors within the patient and community, policy and funding, wider health system, and healthcare facility environments to diminish nurses’ authority and autonomy to execute expanded HIV clinical tasks. These factors include negative attitudes from the community, restrictive legislation and regulations, narrow

scope of practice as defined by nurses' job descriptions, and unsupportive managers, doctors and other members of the healthcare team, among others. For instance, nine of the twenty-six nurses complained that their authority and autonomy was diminished by their having to seek for support and permission to execute expanded HIV clinical roles from doctors. All the nine nurses worked at healthcare facilities with doctors on site. They explained that their lack of autonomy resulted from having to work under the doctors' command, which left them in a very reliant position with limited space to make critical patient-related decisions. To these nurses, disagreeing with doctors' opinions was tough. They argued that if the doctors' dominance that contributed to nurses' limited authority and autonomy were not addressed, it would be a major barrier to the smooth running of nurse-led ART clinics, as these clinics necessitate nurses (at their discretion) to make independent decisions in the interest of their patients without necessarily getting authorisation from the doctor. A senior nurse at a regional referral hospital, who complained about uncooperative doctors, shared her experience:

“Many doctors are not good team players and would, therefore, consider it unusual if you as a nurse were to say, ‘Doctor it is the rule here to have three counselling sessions before we initiate our patients on ART . . . If we take a look at the guidelines . . .’ They (doctors) would say, ‘Yes . . . but I am in charge here’.”

7.3.5 Personal Nurse Environment

The personal nurse environment theme involved two sub-themes including altruism and nurses' number of years of experience in HIV care.

7.3.5.1 Altruism

Most nurses (22 of 26) acknowledged that the development of nurse-led ART clinics was an excellent initiative that would help nurses realise their professional call of helping those HIV-positive patients in need of care. The nurses, in particular, explained that nurses in expanded HIV clinical tasks would be motivated because they would be able to provide the whole range of care for HIV patients, including the prescription for ART initiation without having to refer to doctors. A nurse from a rural Level IV health centre illustrating this thinking said, *“It is being able to do almost everything for the patient . . . being able to manage from start to finish, the entire holistic care that motivates me.”* Nurses reported that they would be able to respond more quickly to the needs of HIV-positive patients, thus forestalling potential crises. They stated that ART prescribing

permitted nurses to adopt a more hands-on and spontaneous approach when providing care. As one nurse from a general hospital argued, *“You can be more proactive and supportive of your client, and I think it is far more spontaneous, as well, so you can change dosages and you can also be very aware of the side-effects.”*

Twenty-one of the twenty-six nurses felt that they would be able to dedicate more time to listening to patients, and less time to thinking about how to get them initiated on ART. They mentioned that nurse-led ART clinics would help nurses overcome frustrations associated with having to wait for doctors, and gain confidence to use their knowledge and skills to provide quality HIV care. They believed that this would increase job satisfaction since nurses would be able to prescribe without having to consult doctors, who are rare. To them, increased job satisfaction would come when nurses witnessed positive treatment outcomes for their patients, a sentiment reflected by one nurse from a rural Level IV health centre, who said: *“It will give us satisfaction as we provide the whole range of HIV services. We have always assessed our patients . . . made a diagnosis, but now we will be able to prescribe and actually follow up our patients without having to wait for a doctor to initiate ART.”*

7.3.5.2 Work Experience in HIV Care

Most study participants, particularly nurses (25 of 26), suggested that nurses who took up clinical tasks in the nurse-led ART clinics would need a minimum of two-to-three years of experience in HIV care to acquire the necessary competencies. They emphasised that such a high level of experience in HIV care was necessary for nurses to gain the necessary competencies to undertake expanded HIV clinical tasks, particularly ART prescription for initiation, and to monitor for treatment success and drug side effects. A nurse-participant from a general hospital argued: *“Before you start prescribing medicines for anybody, you need to have relevant experience, to know what is suitable, what is not, what are the common disease conditions, what to do with them.”*

Eight doctors reported that nurses who had some years of relevant experience in HIV care had developed the skill and ability to interpret laboratory results and correctly prescribe medicines for opportunistic infections. They, however, were concerned that the

less-experienced nurses would not be able to manage PLHIV, who often manifested with complex multiple disease conditions that required treatment using a combination of medicines. For instance, a senior doctor working in a regional referral hospital argued:

“The disadvantage is if you have got inexperienced nurses, they misinterpret the clinical signs which are there, and as a result, the patient might be inappropriately assigned a wrong WHO clinical stage, and these patients may actually not be given a comparable level of care as a doctor would give. Nevertheless, the experience I have had is good because it has largely been with very experienced nurses who have actually taken up clinical work in HIV clinics.”

The participants observed that experience in HIV care was fundamental for nurses to be adequately prepared to take up clinical roles in nurse-led ART clinics. For example, a policymaker from the MoH headquarters in support of considering experience in taking medical decisions, said:

“Disease conditions are never interpreted in seclusion. It is in the perspective of that patient’s other medical problems. Moreover, if nurses are going to be making high-level medical decisions, then the only way they can safely do that is by having had the relevant experience.”

7.3.6 Nurse-Level Outcomes

The interview results revealed nurse-level outcome as a major theme comprised of three sub-themes, namely, nurses’ competencies, motivation, and self-confidence.

7.3.6.1 Nurses’ Competencies

The significance of nurses “*being capable*” of providing HIV services, including ART initiation prescription, was widely mentioned by twenty-four nurses as one of the most important factors that would affect the proper functioning of the proposed nurse-led ART clinics. To describe capability, the nurses used expressions like ‘*having a right level of HIV knowledge*’, ‘*having excellent skills in HIV care*’, ‘*having relevant HIV experience*’, and ‘*having the ability to use this knowledge properly*’. I, therefore, interpreted these expressions to mean ‘competence’. Twenty-five nurse-participants believed that a good level of knowledge and skills in HIV care, good skills about diagnosing concurrent infections, relevant experience in HIV care, and the ability to use this knowledge and

skills appropriately were crucial prerequisites for nurses taking up clinical roles in the proposed nurse-led ART clinics.

Nineteen nurses expressed fears that they lack the capability to request and interpret laboratory results, to make a correct diagnosis of opportunistic infections, to prescribe ARV medication for initiation, and to manage adverse drug reactions. They felt that this lack of capability made them reluctant to take on those clinical tasks in ART clinics. A nurse from an urban general hospital said: *"A nurse running an ART clinic independently, must be capable, have rich knowledge and skills, and be an expert in HIV care including ART."* A nurse-participant who was a leader from the UNMC also expressed this view, saying: *"The success of nurse-led ART clinics primarily depends on the level of the nurse's professional knowledge, expertise, and experience, and the ability to use these competencies well."*

Eleven nurses frequently stressed the importance of *'appropriate use'* of knowledge, explaining that effective provision of HIV care including ART depended on one's ability to collect, comprehend and put together the patient's information from history taking, examination, and investigations while focusing on the patient's needs. To them, this helped the healthcare professional to identify the patient's clinical condition, make a diagnosis, and subsequently, treat or refer appropriately. For example, one nurse from a rural general hospital shared an experience when she had made a decision critical to the patient's life:

"A woman with severe skin rash, yellow eyes, and severe abdominal pain, who had been recently diagnosed with HIV and started on ARVs, was brought in. I immediately knew I was dealing with severe hepatitis resulting from Nevirapine, and I called the doctor . . . I arranged for her labs . . . I put up an intravenous line. Looking at her labs, the doctor exclaimed that any further delay could have been catastrophic . . . if I had not felt capable and my knowledge had been inadequate, something terrible would have happened to this patient."

The nurse's HIV knowledge, experience, clinical reasoning skills as well as her *'feeling capable'*, helped her to get a complete understanding of the clinical picture and come up with an appropriate management plan for that particular patient.

Differences between nurses' and doctors' competencies were regularly mentioned by nine doctor-participants, both regional ART coordinator participants, and all the three national ART trainers, who commented that doctors' thorough understanding of pharmacology meant safer prescription for ART initiation and for opportunistic infections. Four of the five senior doctors believed that nurses lacked the necessary expertise to competently assess and diagnose particularly complex and sometimes concurrent medical conditions in HIV-positive patients. They pointed out that diagnostic skills require systematic training starting with basic medical sciences, anatomy, pharmacology, physiology, biochemistry, and microbiology, to be able to explain phenomena, before moving into clinical practice, history taking, physical examination, laboratory and radiological investigations, diagnosis and treatment plans, to enhance clinical reasoning skills.

A doctor from a regional referral hospital shared his experience as follows:

“Just last week, I admitted a patient with HIV, hypertension, diabetes, and tuberculosis, and I prescribed four different sets of medicines. While I am almost confident that the nurse I work with can prescribe anti-TB medicines, I feel very uncomfortable that all these conditions can be assessed and treated by nurses without doctors' input.”

Furthermore, most participants from both regulatory councils (2 from UNMC and all three officials from UMDPC) and nine of the ten doctor-participants, raised concerns about nurses' competencies in prescribing ARVs for patients with concurrent opportunistic infections. They believed that nurses did not have adequate knowledge and skills to provide safe ART and opportunistic infections co-treatment. All the three participants from the UMDPC raised the same concerns and advised that nurses taking up expanded HIV clinical tasks should be sensitised to identify their limitations and know when to call for help. They called for the monitoring and assessment of nurses' performance as they took up expanded clinical roles in nurse-led ART clinics.

Some participants (4 doctors, 2 national ART trainers, all three officials from UMDPC and all three officials from UNMC) advised the MoH to work with the regulatory councils to clearly develop, communicate, and articulate the range of competencies required for nurses to take up expanded HIV clinical roles. They believed that this would avert any dangers and confusion about the necessary HIV competencies that will come

with the introduction of the nurse-led ART clinics. Furthermore, the participants advised the MoH to put in place capacity-building plans including training followed by on-site mentorships that would help build the competencies of nurses going to take up clinical roles in the nurse-led ART clinics.

7.3.6.2 Nurses' Self-Perceived Competencies in Specific ART Clinical Tasks

When nurses were asked which specific HIV clinical tasks they felt competent at doing, twenty-one nurse-participants felt confident that they had the necessary knowledge and skills to collect appropriately patients' history, provide patients' education on HIV transmission and prevention, and provide adherence counselling. The same number of nurses (21 of 26) felt confident at ordering appropriate laboratory investigations, establishing medical eligibility for ART, and recommending first-line ARV regimen for ART-naïve patients, including HIV-positive pregnant women. Ten nurse-participants felt competent at deciding when to start ART in patients without active opportunistic infections, prescribing first-line ART medicines, and conducting clinical monitoring for patients on first-line ARV regimen. The same number of nurses (10 of 26) felt confident at recognising and managing self-limiting ARV drug side effects, recognising treatment failure from clinical symptoms, recognising and referring PLHIV with difficult medical conditions, and following-up those patients on ART. A nurse illustrating this feeling of confidence said, *"I am a lot more confident at ordering appropriate laboratory investigations, making a diagnosis and suggesting different regimens and approaches to medication as the need may be."*

Eight nurses felt confident at interpreting laboratory results, making an appropriate diagnosis, treating opportunistic infections such as oral thrush, prescribing ARV drugs, and managing drug side effects. However, none of them felt confident at interpreting laboratory and radiological investigation results, and at managing HIV-positive patients co-infected with tuberculosis and cryptococcal meningitis (particularly in children). Furthermore, none of them felt confident at switching from first-line to second-line ART in HIV-positive patients with treatment failure.

7.3.6.3 Nurses' Self-Confidence

Twenty nurses considered nurses' self-confidence as an important determinant in executing expanded HIV clinical tasks. To them, self-confidence was one's belief in themselves and their capabilities. They argued that self-confidence increases their possibility of making independent decisions, which was critical in managing complex illnesses often experienced by PLHIV. For example, a nurse from an urban Level IV health centre illustrating the importance of self-confidence said, *"When you are confident, then you can manage even the most complicated HIV case . . . I mean you can affirm yourself and implement your decisions for the benefit of the patient."*

In agreement, a nurse from a rural general hospital described her experience:

"A patient on ARVs for three months was brought in unconscious and with generalised lymphadenopathy . . . I knew I was dealing with a severe case of immune reconstitution inflammatory syndrome in a patient who was wrongly started on ART without ruling out tuberculosis. I put up an intravenous line, started her on steroids, and called for the ambulance that took eight hours to arrive. I was positive about my ability, but many nurses I know would wait for doctors because they lack self-confidence."

Most participants (24 nurses, 9 doctors, and both regional ART coordinators) noted that nurses lacked self-confidence due to inappropriate education and negative sentiments within the health system and the community, which frequently affirmed that nurses were not as competent as doctors because they were not as educated. A policymaker from the MoH headquarters pointed out the effects of these perceptions on nurses: *"This frequent assertion by doctors and the community as a whole that nurses are not as educated as doctors, has ultimately made nurses believe that they are not competent and are only special agents for carrying out doctors' orders."*

A national ART trainer also pointed out that the effects of lack of self-confidence: *"We trained the nurses to provide ART to children, but when you visit them, they are not initiating children, claiming that they fear and are not confident at handling children."*

Six doctors and two policymakers attributed doctors' confidence in making complicated decisions such as managing ART clients with treatment failure to their extensive training and intellect. They wondered how nurses, who lacked confidence in themselves due to inadequate training, would take on clinical roles in HIV care. This claim could be traced to the notion that nurses' roles and education are inferior to those of doctors. In fact, three senior doctors categorically alleged that nurses' intelligence is too low for them to manage HIV-positive patients confidently and competently on their own. For example, a senior doctor from a regional referral hospital stated, *'I have very strong concerns about some of the nurses' basic intelligence to manage HIV patients on ART on their own.'*

On the contrary, three doctors were concerned about overconfident nurses. They explained that they were talking about inappropriate confidence, and gave examples of over-confident nurses who took on clinical roles for which they had no competencies and therefore caused severe adverse reactions in patients. For example, a senior doctor from a regional referral hospital, citing the need for moderation among nurses said, *"You are rather cross by the under-confident ones but scared to your bone marrow by the over-confident ones."*

However, eight doctors, including those who thought that nurses did not have adequate intelligence, acknowledged that nurses' confidence could be developed over time through experience and mentoring, but only when the concerned nurse was interested in learning, and the mentor was interested in training.

To introduce the nurse-led ART clinics successfully, most participants, including nurses, advised the GoU to institute a training curriculum that covers motivational education to build nurses' self-confidence and technical elements of HIV care to build their technical competencies. They further recommended that the government should put in place a mentoring programme for nurses to build their self-confidence as well as their technical competencies.

7.3.6.4 Nurses' Motivation

There was a general view from participants (14 nurses, 1 regional ART coordinator, and the 3 national ART trainers) that only motivated nurses willing to serve HIV-positive patients will be appropriate to take up expanded HIV clinical tasks. They argued that motivation was more important than the prior level of education because only nurses with a passion for carrying out HIV work would be willing to expend the extra effort, first to acquire the necessary competencies and, second to do the work amidst numerous challenges often experienced in HIV clinic environments. Fourteen nurses mentioned that some of their colleagues trained in HIV care did not work in HIV clinics because they lacked motivation. They perceived this as a waste of resources and raised the issue of the need to choose carefully nurses who were motivated to work in HIV clinics to go for the training. Both regional ART coordinators as well observed that some healthcare workers did not implement the skills they had learnt due to lack of motivation or interest in HIV work. As one national, ART trainer explained:

“Self-motivation of nurses is critical if they are to work in these often high-patient-loads HIV clinics with severe scarcity of supplies. Some healthcare workers only come to the training to pick a certificate for their CV; they are not motivated to perform the new tasks.”

Another aspect of motivation brought up during the interviews was staff morale. Nineteen nurses interviewed thought that in the absence of financial incentives, it was important to find other non-financial ways, such as recognition and appreciation, to motivate them. As a nurse in-charge of a primary health facility suggested, *“Even a letter of gratitude and appreciation for their work is comforting”*.

7.4 Summary

The study participants have revealed numerous factors within the patient and community, policy and funding, wider health system, healthcare facility and personal nurse environments positively or negatively influence the development and implementation of effective nurse-led ART clinics in Uganda. They have reported major facilitators to the development and implementation of effective nurse-led ART clinics to include the high demand for HIV services amidst the acute shortage of doctors and the presence of the HIV in-service training course. They have also identified major barriers to nurse-led ART in Uganda as including restrictive legislation, which limit nurses'

prescriptive powers; the limited clinical reasoning skills among nurses; unclear nurses' roles and responsibilities in HIV care, which leave nurses allocated lots of administrative work, and restrictive job descriptions that prevent nurses from taking up expanded HIV clinical roles. Other challenges identified in this study are low numbers of healthcare workers, including nurses themselves, coupled with high patient loads, which result in unmanageable workloads and a lack of reward and recognition for nurses who take on extra tasks in HIV care, which demotivate nurses from taking up expanded roles. Further, the perception among nurses that the government was developing nurse-led ART clinics to substitute the more expensive doctor-led ART clinics, which demotivate nurses from taking up expanded HIV clinical roles, would remain a major barrier unless addressed. A significant challenge also revealed by this study was related to the negative patients' and community perceptions that doctors have superior skills to nurses, which discourage nurses from taking up expanded clinical roles in ART. Further, infrastructural challenges such as inadequate clinic space, laboratory services, equipment, and communication facilities, as well as the ineffective referral system, were revealed by this study as negatively influencing the effectiveness of nurse-led ART clinics.

8 Nurses' and Doctors' Competencies in HIV Clinical Care

8.1 Introduction

This chapter presents the results of Objective 3 of this study, an objective that seeks to assess nurses' and doctors' competencies in providing HIV clinical care including ART. These competencies were assessed through their mean scores in eight paper-based HIV clinical vignette tests, comprised of four simple and four complex vignettes. Each simple vignette represents a common, uncomplicated HIV-related disease condition in Uganda, while each complex vignette is a complicated version of the simple. For example, the Simple HIV Clinical Vignette 1 represents an HIV-positive patient with tuberculosis disease of the lungs, while the corresponding complex version, the Complex HIV Clinical Vignette 1, represents an HIV-positive patient with disseminated tuberculosis disease involving both the lungs and the meninges.

In this chapter, nurses' and doctors' mean scores in the HIV clinical vignettes are presented as follows: each of the eight HIV clinical vignettes, the four simple HIV clinical vignettes aggregated, the four complex HIV clinical vignettes aggregated, and the eight HIV clinical vignettes aggregated. Hereafter, each of the eight HIV clinical vignettes will be referred to as simple vignette (1,2,3,4) and complex vignette (1,2,3,4); the four simple HIV clinical vignettes aggregated as four simple vignettes aggregated; the four complex HIV clinical vignettes aggregated as four complex vignettes aggregated; and the eight HIV clinical vignettes aggregated as eight vignettes aggregated.

The results are presented in seven sections. The first three sections present study participants' socio-demographic characteristics, nurses' and doctors' mean scores in each of the eight vignettes, nurses' and doctors' mean scores in the four simple vignettes aggregated, four complex vignettes aggregated, and the eight vignettes aggregated. The last four sections present the nurses' and doctors' mean score variations in the four simple, the four complex, and the eight vignettes aggregated categories; nurses' and doctors' mean scores by domains of HIV clinical care; the effect of years of work experience in HIV care on mean scores; and the chapter summary.

8.2 Study Participants' Demographic Characteristics

Of the one hundred and thirty-five participants who took the vignette tests, ninety (67 percent) were nurses and the rest doctors. Irrespective of their profession, seventy-two (53 percent) of the participants had more than two years of working experience in HIV care. Fifty-nine of the ninety nurses (66 percent) had more than two years of working experience in HIV care, compared to only twelve of the forty-five doctors (27 percent) with similar experience.

8.3 Mean Scores in each Vignette

Although doctors' mean scores in each of the eight vignettes are higher than those of nurses, their greatest differences are observed in the four complex vignettes when compared to the four simple vignettes (Table 8.1). For example, although doctors scored higher than nurses in the simple vignettes 2 and 4, the differences in mean scores are not significant. On the other hand, doctors scored higher than nurses in each of the four complex vignettes, with all the differences being highly significant. Based on this finding, one can reasonably say that nurses might be as competent as doctors at managing fifty percent of the simple HIV-related disease conditions in Uganda, while doctors are most likely more competent at managing the other fifty percent of the simple HIV-related disease conditions and all the four complicated HIV-related disease conditions presented to them.

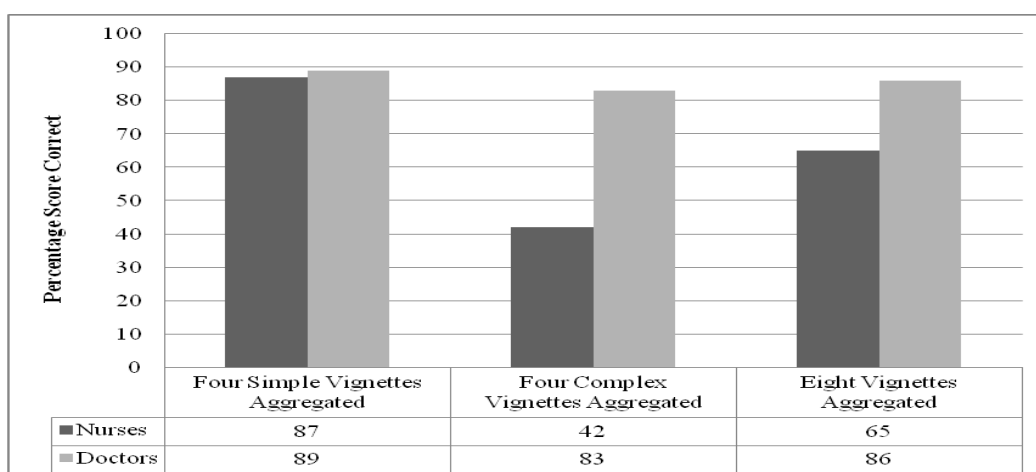
Table 8-1: Mean Scores in each Vignette

Clinical Vignette	Percentage Mean Score (Sd)			P-value
	Doctors	Nurses	Difference	
Simple Vignette 1	83 (9.3)	78 (5.4)	5	< 0.001
Complex Vignette 1	84 (10.4)	47 (12.5)	37	< 0.001
Simple Vignette 2	89 (5.4)	88 (5.0)	1	0.991
Complex Vignette 2	81 (9.0)	45 (11.3)	36	< 0.001
Simple Vignette 3	95 (4.6)	92 (6.0)	3	0.004
Complex Vignette 3	74 (7.6)	33 (13.0)	41	< 0.001
Simple Vignette 4	90 (5.6)	89 (5.8)	1	0.340
Complex Vignette 4	91 (5.5)	44 (9.4)	47	< 0.001

8.4 Mean Scores in the Four Simple, Four Complex, and the Eight Vignettes Aggregated Categories

Although doctors' mean scores are higher than those of nurses in all the three vignette categories (four simple, four complex, and eight vignettes aggregated), they are much higher in the four complex and in the eight vignettes aggregated categories with differences that are highly significant (Figure 8.1). From these results, it is apparent that doctors' much higher mean score in the eight vignettes aggregated category results from their considerably better scores in the complex vignettes compared to those of nurses.

Figure 8-1: Mean Percentage Scores in the Four Simple Vignettes Aggregated, Four Complex Vignettes Aggregated, and the Eight Vignettes Aggregated Categories



% difference	2% (Sd 2.6%)	41% (Sd 5.3%)	21% (Sd 4.7%)
P-value	= 0.003	< 0.001	< 0.001

These results suggest that although doctors are more competent than nurses at managing the simple HIV-related disease conditions taken as a whole, they are much more competent at managing the four complex HIV-related disease conditions aggregated, and all the eight HIV-related disease conditions aggregated.

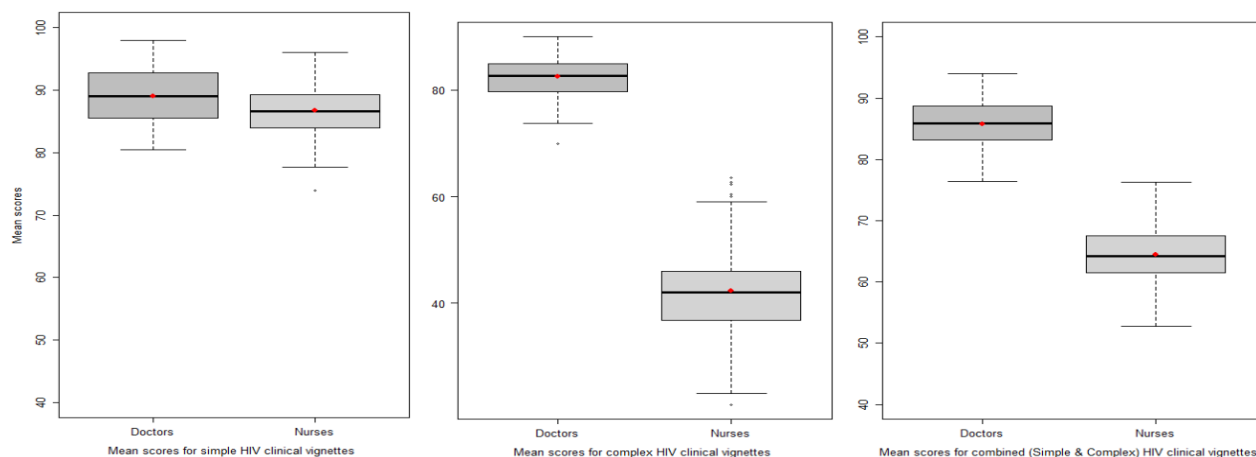
8.5 Mean Score Variations in the Four Simple, Four Complex, and Eight Vignettes Aggregated Categories

The results of analyses of variations between nurses' and doctors' mean scores in the four simple, four complex, and in the eight vignettes aggregated categories are presented in this section.

8.5.1 Mean Score Variations in the Four Simple Vignettes Aggregated

In the four simple vignettes aggregated, an analysis of variation within the doctors' group shows a narrow variation of the lowest- and highest-scoring doctors from their group mean score (Figure 8.2). Similarly, an analysis of variation within the nurses' group shows a narrow variation of the lowest- and highest-scoring nurses from their group mean score. These narrow variations point to uniformity in the scores of individual doctors and individual nurses within their respective groups in the four simple vignettes aggregated. In other words, individual doctors have almost similar scores within their group, which is also the case for individual nurses within their group. By implication, individual doctors and individual nurses might have similar competencies at managing simple HIV-related disease conditions taken as a whole, within their respective professional groups.

Figure 8-2: Variations in Nurses' and Doctors' Mean Scores in the Four Simple, Four Complex, and Eight Vignettes Aggregated Categories



P-value for four simple vignettes aggregated is 0.003
P-value for four complex vignettes aggregated is < 0.001
P-value for eight vignettes aggregated is < 0.001

A cross-group analysis of variation between doctors' and nurses' mean scores in the four simple vignettes aggregated reveals an overlap (Figure 8.2). This overlap indicates that the scores of some nurses are identical to those of some doctors. In other words, there is no difference in the scores of some individual nurses and some individual doctors in the four simple vignettes aggregated. Indeed, some nurses performed better than some doctors in these vignettes. From these results, it is evident that some doctors might have the same level of competencies at managing simple HIV-related disease conditions taken as a whole as some nurses.

8.5.2 Mean Score Variations in the Four Complex Vignettes Aggregated

Similar to what is observed in the four simple vignettes aggregated, in the four complex vignettes aggregated, the results indicate narrow variations of the scores of the lowest- and highest-scoring doctors from their group mean score. On the contrary, the results indicate wide variations in the scores of the lowest- and highest-scoring nurses from their group mean score. The narrow variations within the doctors' group indicate that the scores of individual doctors in the complex vignettes are homogenous while the wide variations within nurses' group indicate that the scores of individual nurses are

heterogeneous. From these results, it appears that while individual doctors might have more or less the same level of competencies at managing complex HIV-related disease conditions taken as a whole, individual nurses have different levels of competencies at managing the same disease conditions. Indeed, in the four complex vignettes aggregated, a few nurses scored close to sixty percent, while some of their colleagues scored less than ten percent.

On a cross-group analysis of variation, the overlap between doctors' and nurses' mean scores observed in the four simple vignettes aggregated does not occur in complex ones. In the four complex vignettes aggregated, doctors scored much higher than nurses, with the lowest-scoring doctor getting an even higher score than the highest-scoring nurse. By inference, these results affirm the earlier assertion that doctors are probably much more competent at managing complex HIV-related disease conditions than nurses.

8.5.3 Mean Score Variations in the Eight Vignettes Aggregated

In the eight vignettes aggregated, while the results show a narrow variation of the scores of the lowest- and highest-scoring doctors from their group mean score, the same is not true for nurses as there is a wide variation of the scores of the lowest- and highest-scoring nurses from their group mean score (Figure 8.2). As is observed with the four complex HIV-related disease conditions, these results suggest that individual doctors have more or less the same level of competencies at managing all the HIV-related disease conditions taken as a whole compared to individual nurses who have significantly varying levels of competencies at managing the same disease conditions.

8.6 Mean Scores by Domains of HIV Clinical Care

In this section, nurses' and doctors' mean scores broken down by domains of HIV clinical care starting with the four simple vignettes aggregated, followed by the four complex vignettes aggregated, and the eight vignettes aggregated is presented.

8.6.1 Mean Scores in the Four Simple Vignettes Aggregated by Domains of Clinical Care

In the four simple vignettes aggregated, nurses scored higher than doctors in the domains of ‘elicited the entire relevant history’ and ‘determined the relevant physical examination items’ with highly significant differences (Table 8.2). On the other hand, doctors scored higher than nurses in the domains of ‘made a correct diagnosis including aetiology’ and ‘made a complete treatment plan’ with highly significant differences. However, there is no significant difference observed between the doctors’ and nurses’ mean scores in the domain of ‘ordered the necessary laboratory or imaging tests’ in the four simple vignettes aggregated. Based on this finding, it is evident that in the four simple vignettes aggregated, nurses might be more competent than doctors in the HIV clinical care domains of eliciting relevant patient history and conducting a physical examination, which involve pre-assessment. On the other hand, doctors might be more competent than nurses in the domains of making a correct diagnosis including aetiology and making a complete treatment plan, which involves clinical reasoning.

Table 8-2: Mean Scores in the Four Simple Vignettes Aggregated by Domains of Clinical Care

Domains of clinical care	Mean Scores		Difference	P-value
	Doctors Mean(Sd)	Nurses Mean(Sd)		
1 Elicited the entire relevant history	93 (1.1)	99 (0.3)	6	<0.001
2 Determined relevant physical exam items	89 (1.1)	95 (1.1)	6	<0.001
3 Ordered necessary lab or imaging tests	89(1.4)	90 (1.5)	1	0.288
4 Made correct diagnosis including aetiology	88 (1.0)	79 (1.7)	9	<0.001
5 Made a complete treatment plan	88 (1.5)	71 (2.1)	18	<0.001

On further analysis in the four simple vignettes aggregated, both doctors’ and nurses’ groups obtained their highest mean scores in the domain of ‘elicited the entire relevant history’ and their lowest mean score in the domain of ‘made a complete treatment plan’. However, although the two groups scored highest and lowest in the same domains, the

nurses' group has a wider variation range with a twenty-eight percent difference between the domains in which they scored highest and lowest compared to the doctors' group with a five percent difference (Table 8.2). The wide variation range among the nurses' group suggests that their competencies might vary significantly for the different domains of the four simple vignettes aggregated, with nurses probably being more competent in the domain 'elicited the entire relevant history', but much less competent in the domain 'made a complete treatment plan'. By implication, this finding further affirms the earlier assertion that nurses, unlike doctors, might be less competent in domains involving clinical reasoning since they score low in such domains when compared to those involving patient assessment.

8.6.2 Mean Scores in the Four Complex Vignettes Aggregated by Domains of Clinical Care

As depicted in Table 8.3, although doctors scored higher than nurses in all the five domains of clinical care in the four complex vignettes aggregated, with all the differences in mean scores being highly significant, their greatest differences are observed in the domains of 'made a complete treatment plan' and 'made correct diagnosis including aetiology', which involve clinical reasoning.

Table 8-3: Mean Scores in the Four Complex Vignettes Aggregated by Domains of Clinical Care

Domains of clinical care	Percentage Mean Scores			
	Doctors(<i>Sd</i>)	Nurses(<i>Sd</i>)	Difference	p-value
1 Elicited the entire relevant history	86 (1.7)	72 (2.4)	14	<0.001
2 Determined relevant physical exam items	83(1.2)	57 (2.8)	26	<0.001
3 Ordered necessary lab or imaging tests	82 (1.2)	40 (2.4)	42	<0.001
4 Made correct diagnosis including aetiology	81(1.1)	29 (2.3)	52	<0.001
5 Made a complete treatment plan	82(1.5)	14 (2.0)	69	<0.001

On further analysis of the scores in the domains of the four complex vignettes aggregated, the doctors' and nurses' groups obtained their highest mean scores in the same domain, 'elicited the entire relevant history'. The two groups, however, obtained

their lowest mean scores in different domains, ‘made a correct diagnosis including aetiology’ for doctors and ‘made a complete treatment plan’ for nurses.

As is observed in the four simple vignettes aggregated (Table 8.2), in the four complex vignettes aggregated, the nurses’ group has a wider variation range with a fifty-eight percent difference between the domains in which the group scored highest and lowest compared to the doctors’ group with a five percent difference. This finding again implies that unlike with the doctors, nurses’ competencies in the different domains of clinical care might vary significantly. Nurses are probably more competent in the domain of ‘eliciting the entire relevant history’, which involves patient assessment than they are in the domain of ‘making a complete treatment plan’, which involves clinical reasoning.

8.6.3 Mean Scores in the Eight Vignettes Aggregated by Domains of Clinical Care

In the eight vignettes aggregated, doctors scored higher than nurses in all the five domains of clinical care with all the differences being highly significant (Table 8.4). Still, as is observed with the four complex vignettes aggregated, the greatest differences between doctors’ and nurses’ performance in the eight vignettes aggregated are observed in the domains of ‘made a complete treatment plan’ and ‘made correct diagnosis including aetiology’, which involve clinical reasoning.

Table 8-4: Mean Scores in the Eight Vignettes Aggregated by Domains of Clinical Care

Domains of clinical care	Percentage Mean Scores (Sd)			
	Doctors	Nurses	Difference	P-value
Elicited the entire relevant history	88(1.2)	86 (1.2)	2	<0.001
Determined relevant physical exam items	86 (0.9)	76 (1.6)	10	<0.001
Ordered necessary lab or imaging tests	85 (1.1)	65 (1.3)	20	<0.001
Made correct diagnosis including aetiology	84 (0.8)	54 (1.5)	30	<0.001
Made a complete treatment plan	85 (1.2)	42 (2.1)	43	<0.001

In the eight vignettes aggregated, doctors and nurses obtained their highest mean scores in the same domain of ‘elicited the entire relevant history’, but the two groups obtained their lowest mean scores in two different domains - ‘made a correct diagnosis including aetiology’ for doctors, and ‘made a complete treatment plan’ for nurses (Table 8.4). As observed in the four simple vignettes aggregated and in the four complex vignettes aggregated, in the eight vignettes aggregated, the nurses’ group has a wider variation range with a forty-four percent difference between the domains in which the group scored highest and lowest compared to the doctors’ group with only a four percent difference. This finding suggests that in all the eight HIV-related disease conditions taken as a whole, nurses are probably more competent at eliciting the entire relevant history but much less competent at making a complete treatment plan, unlike the doctors who have more or less the same level of competencies across the five domains of HIV clinical care.

8.7 Effect of Nurses’ and Doctors’ Work Experience in HIV Care on their Mean Scores in the Vignette Categories

This section describes the results of the effect of years of work experience in HIV care on nurses’ and doctors’ mean scores in three vignette categories investigated by comparing the mean scores of those with two or fewer years of work experience in HIV care with those with the same or more years of work experience. The results of this effect are presented starting with the four simple vignettes aggregated, followed by the four complex vignettes aggregated, and lastly by the eight vignettes aggregated categories.

8.7.1 Effect of Work Experience in HIV Care on Mean Scores in the Four Simple Vignettes Aggregated

The results show no significant difference between mean scores of nurses with more than two years of work experience in HIV care and doctors with two or fewer years of experience (Table 8.5). Based on this finding, it appears that nurses with more than two years of work experience in HIV care might have more or less the same level of competencies at managing the simple HIV-related disease conditions taken as a whole, as doctors with two or fewer years of experience.

Table 8-5: Mean Scores in the Four Simple Vignettes Aggregated by Nurses' and Doctors' Years of Work Experience in HIV Care

Years of work experience in HIV care	Mean Score (Sd)	Mean Score (Sd)	Mean Difference	P-value
Doctors (≤ 2) vs Nurses (≤ 2)	89(4.4)	85(3.7)	4	<0.001
Doctors (≤ 2) vs Nurses (> 2)	89(4.4)	88(3.9)	1	0.209
Doctors (>2) vs Nurses (≤ 2)	88(4.5)	85(3.7)	3	0.135
Doctors (>2) vs Nurses (>2)	88(4.5)	88(3.9)	0	0.958
Doctors (>2) vs Doctors (≤ 2)	88(4.5)	89(4.4)	1	0.858
Nurses (>2) vs Nurses (≤ 2)	88(3.9)	85(3.7)	3	0.048

Further, as shown in Table 8.5, there is no significant difference in the mean scores of doctors with more years of work experience in HIV care and nurses with less work experience, which again implies that these two groupings might have the same level of competencies at managing the simple HIV-related disease conditions taken as a whole. These findings are rather surprising, because as shown in Figure 8.1, without disaggregation by years of work experience in HIV care, doctors scored higher than nurses in the four simple vignettes aggregated with a significant difference. Thus, one would expect that doctors with more years of work experience in HIV care would score even better, but instead, they scored at the same level as nurses with less experience. By inference, these findings strongly suggest that work experience in HIV care might improve nurses' competencies at managing the simple HIV-related conditions taken as a whole, but not those of doctors.

8.7.2 Effect of Work Experience in HIV Care on Mean Scores in the Four Complex Vignettes Aggregated

In the four complex vignettes aggregated, doctors' mean scores are higher than those of nurses irrespective of either group's years of work experience in HIV care, with significant differences (Table 8.6).

Table 8-6: Mean Scores in the Four Complex Vignettes Aggregated by Nurses' and Doctors' Years of Work Experience in HIV Care

Years of work experience in HIV care	Mean (Sd)	Mean (Sd)	Mean difference	P-value
Doctors(≤ 2) vs Nurses(≤ 2)	69(8.9)	12(6.5)	57	<0.001
Doctors(≤ 2) vs Nurses(> 2)	69(8.9)	22(9.2)	47	<0.001
Doctors(>2) vs Nurses(≤ 2)	70(5.4)	12(6.5)	58	<0.001
Doctors(>2) vs Nurses(>2)	70(5.4)	22(9.2)	48	<0.001
Doctors(>2) vs Doctors(≤ 2)	70(5.4)	69(8.9)	1	0.843
Nurses(>2) vs Nurses(≤ 2)	22(9.2)	12(6.5)	10	<0.001

Also, in the four complex vignettes aggregated, analyses of mean scores within the nurses' group disaggregated by years of work experience in HIV care revealed that nurses with more than two years of work experience scored ten percent higher than their counterparts with two or fewer years of work experience with a highly significant difference. However, in the four complex vignettes aggregated, even though doctors with more than two years of work experience in HIV care scored one percent higher than those with two or fewer years of experience, the difference is not significant.

As observed in the four simple vignettes aggregated, based on these findings, years of work experience in HIV care might improve nurses' competencies at managing complex HIV-related disease conditions taken as a whole, but not those of doctors. However, contrary to what is observed in the four simple vignettes aggregated, the competencies of nurses with more years of work experience in HIV care still do not match those of the doctors with less work experience in the four complex vignettes aggregated, even with these improvements.

8.7.3 Effect of Work Experience in HIV Care on the Mean Scores in the Eight Vignettes Aggregated

As is observed in the four complex vignettes aggregated, in the eight vignettes aggregated, the doctors' mean score is higher than that of nurses irrespective of either group's years of work experience in HIV care (Table 8.7). This difference is also highly significant, implying that experience might not improve nurses' competencies to manage complex HIV-related disease conditions to the level of doctors.

Table 8-7: Mean Scores in the Eight Vignettes Aggregated by Nurses' and Doctors' Years of Work Experience in HIV Care

Years of work experience in HIV care	Mean (Sd)	Mean (Sd)	Mean difference	P-value
Doctors (≤ 2) vs Nurses (≤ 2)	74(5.4)	35(2.8)	39	<0.001
Doctors (≤ 2) vs Nurses (> 2)	74(5.4)	45(9.5)	29	<0.001
Doctors (> 2) vs Nurses (≤ 2)	72(8.7)	35(2.8)	37	<0.001
Doctors (> 2) vs Nurses (> 2)	72(8.7)	45(9.5)	27	<0.001
Doctors (> 2) vs Doctors (≤ 2)	72(8.7)	74(5.4)	2	0.668
Nurses (> 2) vs Nurses (≤ 2)	45(9.5)	35(2.8)	10	<0.001

Still, like in the four complex vignettes aggregated, in the eight vignettes aggregated, nurses with more than two years of work experience in HIV care scored ten percent higher than their counterparts with two or fewer years of work experience, with a highly significant difference. This finding strongly suggests that work experience in HIV care might improve nurses' competencies at managing all the HIV-related disease conditions taken as a whole, compared to their counterparts with less experience. However, as is observed in the four complex vignettes aggregated, the improvements in mean scores among the nurses with more experience did not even match those of the doctors with less experience in the eight vignettes aggregated.

8.8 Chapter Summary

This chapter has presented the findings of a survey that examined the competencies of nurses and doctors in eight HIV-related disease conditions comprised of four simple and four complex conditions presented as paper-based vignettes. The results have revealed that although on the whole doctors scored higher than nurses in all the eight HIV-related disease conditions, a marked difference in their mean scores was observed in the four complex cases. Overall, while there is a narrow variation range in the mean scores of doctors in the five domains of HIV clinical care in all the vignette categories, there is a wide variation range in the mean scores of nurses. Nurses scored highest in the domain of 'elicited the entire relevant history' but much lower in the domain of 'made a complete treatment plan' in all the three vignette categories. The mean scores of nurses with more years of work experience in HIV care in the three vignette categories (four simple vignettes aggregated, four complex vignettes aggregated, and the eight aggregated) were higher than of those with less work experience; such a case is not true for the doctors. By implication, doctors might be more competent than nurses at

managing all the eight HIV-related disease conditions, but their greatest differences in competencies are with the complex disease conditions. In the three vignette categories, doctors are competent across the five domains of HIV clinical care, unlike the nurses who are more competent at eliciting the entire relevant history but less competent at making a complete treatment plan. Lastly, years of work experience in HIV care might improve nurses' competencies at managing HIV-related disease conditions but not those of doctors. In the next chapter, I present the discussion of the current study findings.

9 Discussion

9.1 Introduction

This chapter presents a discussion of the results of this study, which set out to identify facilitators and barriers to the development and implementation of effective nurse-led ART clinics in Uganda. It also presents the modified conceptual framework showing factors that influence the development and implementation of effective nurse-led ART clinics. Finally, it presents the limitations of the study. This study found factors located within the patient and community, policy and funding, wider health system, healthcare facility, and personal nurse environments to create facilitators or barriers to the development and implementation of effective nurse-led ART clinics in Uganda. A discussion of how factors within the patient and community environment influence the effectiveness of nurse-led ART clinics follows.

9.2 Patient and Community Environment

This study has revealed that the demand for HIV services amidst the severe shortage of doctors to provide them, the community and patients' attitudes towards nurses as providers of ART, the community and patients' perceived benefits of nurse-led ART clinics, and the community and patients' perceived complexity of illness have the most significant external influence on the development and implementation of effective nurse-led ART clinics. This influence can be positive or negative. The discussion of the effect of the demand for HIV services amidst the acute shortage of doctors on the development and implementation of effective nurse-led ART clinics follows.

Similar to earlier studies on task shifting in Uganda (Okero 2003, MOH 2006, ECSA-HC 2010, Dambisya and Matinhure 2012 , MOH and USAID 2015), the current study has revealed that the high demand for HIV services amidst the pervasive shortage of doctors has forced the introduction of nurse-led ART clinics in practice even though the legislation pertaining to nurses' scope of practice does not provide for them. In fact, unlike the previous studies that only examined the views of policymakers and healthcare workers, this study is unique in that it also sought the perspectives of HIV-positive patients on ART who also affirmed that most times it was nurses who made ART

initiation prescription for them and only had doctors sign them off afterwards for authorisation. The patients' revelation that it was nurses who made the prescription for ART initiation for them points to the high prevalence of nurse-led ART clinics in practical terms.

Having the already scarce nurses and doctors performing the same tasks for the same patient creates inefficiencies within the healthcare system, which could be avoided by granting nurses prescriptive authority and autonomy to provide the full range of HIV services. Prescriptive authority and autonomy for nurses might also reduce on the time patients spend waiting for doctors to sign off their prescriptions made by nurses, thus improving access to HIV care services and timeliness. Improving accessibility to HIV care and reducing patient waiting time is particularly critical for patient satisfaction and acceptability of nurses as providers of ART since most patients in the current study used accessibility to HIV services and waiting time as important criteria to gauge the quality of HIV services they received. By granting nurses authority and autonomy to execute expanded HIV clinical tasks, doctors' time might also be freed up thereby enabling them to concentrate on managing complicated cases. The influence of community and patients' attitude towards nurses in expanded HIV clinical roles on the effectiveness of nurse-led ART clinics is discussed next.

Participants in the current study, particularly nurses, doctors, and policymakers, believed that the community and patients hold negative attitudes towards nurses' ability to provide expanded HIV clinical services competently and safely, a finding also reported by earlier studies on task shifting in Uganda (ECSA-HC 2010) and Burkina Faso (Bocoum, Kouanda et al. 2013). Similar to these studies (ECSA-HC 2010, Bocoum, Kouanda et al. 2013), the current study found that nurses and many of their colleagues were demotivated and discouraged from taking up expanded HIV clinical roles by these negative community and patient attitudes. The fears expressed by nurses, doctors, and policymakers that patients who are accustomed to being seen by doctors whom they perceive as more competent than nurses might shun nurse-led ART clinics, were indeed confirmed by some patients in the current study who were unwilling to accept nurses as providers of ART unless there was no available alternative. These patients, used to seeing nurses take instructions from doctors, found it difficult to accept nurses working

autonomously in HIV clinics. People living with HIV in a study conducted by Patterson, Russell et al. (2007) in six countries in SSA, including Uganda, to solicit their views on nurse-led care, similarly expressed negative views towards nurses taking up expanded HIV clinical roles. They believed that nurses had inadequate medical training, low knowledge levels, and poor interpersonal skills manifested through their stigmatising and rude behaviour towards patients (Patterson, Russell et al. 2007). Also, Mukora, Charalambous et al. (2011) and Georgeu, Colvin et al. (2012) in South Africa, and Bocoum, Kouanda et al. (2013) in Burkina Faso found that patients did not support nurse-led ART clinics for fear of stigma and discrimination since these clinics provide HIV services closer to patients' homes. Even though patients in the current study did not raise stigma and discrimination associated with HIV as a concern, Alamo, Wabwire-Mangen et al. (2012) and Namagembe (2015) have reported stigma and discrimination linked to HIV to be on the rise in Uganda and could deter many HIV-positive patients from accessing care and treatment from nurse-led ART clinics closer to their homes. The influence of community and patients' perceived benefits of nurses in expanded HIV clinical roles on the effectiveness of nurse-led ART clinics is discussed next.

Contrary to the concerns raised by nurses, doctors, and policymakers that patients would turn down nurse-led ART clinics for various reasons, also confirmed by some patients, most patients in this study preferred nurses for their routine HIV services. Patients in the current study believed that nurses in expanded HIV clinical roles increase access to ART, reduce patient waiting time, offer friendlier services, provide better consultation time, and provide comprehensive adherence education, a finding supporting those of other studies in SSA (Boyer, Protopopescu et al. 2011, Assefa, Kiflie et al. 2012, Georgeu, Colvin et al. 2012, Iwu and Holzemer 2014, O'Malley, Asrat et al. 2014). Patients in the current study also linked their enhanced understanding of their HIV disease condition and improved adherence to treatment to nurses' effective communication skills, which doctors lacked, a finding echoing that of Assefa, Kiflie et al. (2012) in Ethiopia.

Patients in the current study particularly valued established relationships with their healthcare providers. These patients mentioned that nurses, more than doctors, were able to form meaningful relationships with their patients, and thus were able to offer individualised care to them. In the current study, the importance of established

relationships in improving patients' acceptability of nurses as providers of ART manifested itself through the finding that patients whose prior experience of receiving ART-specific services from nurses was positive tended to rate nurses' competencies highly when compared to those without such experience. Mukora, Charalambous et al. (2011), in a study in an urban clinic in South Africa, also found that patients linked their confidence in nurses' competencies to situations where nurses had solved their health problems that doctors had either ignored or missed. Other researchers in industrialised countries have also found patients' acceptability of nurses in expanded roles to be associated with nurses' approachability, communication style, and consultation time (Litaker, Mion et al. 2003, Miles, Penny et al. 2003, Flynn 2005, Burrows 2006, Caldwell, Bond et al. 2006, Stenner and Courtenay 2008, Haskard and Dimatteo 2009, Stenner, Carey et al. 2010, Mahomed, St-John et al. 2012). These nurse characteristics that are highly appreciated by patients are in many ways similar to the elements of the person-centred nursing framework suggested by McCormack and McCance (2006) and Pelzang (2010). Such person-centred characteristics, particularly, relationships and approachability will need to be promoted among nurses selected to run nurse-led ART clinics if these nurses are to be acceptable to patients. The influence of the community and patients' perceived complexity of the illness on the acceptability of nurses as providers of expanded HIV clinical services is discussed next.

This study revealed that most patients preferred nurses to manage disease conditions they perceived to be less serious in nature, a finding which is not unique to it as other researchers have also demonstrated a similar trend (Pioro, Landefeld et al. 2001, Fletcher, Baker et al. 2007, Brodsky and Van-Dijk 2008, Van-Offenbeek, Sorge et al. 2009, Rashid 2010). Patients in the current study preferred doctors to nurses to manage disease conditions they perceived to be complex arising from their belief that doctors are more educated and thus more competent at managing such conditions. It appears that patients are willing to receive from nurses HIV health education, patient assessment, and monitoring of treatment, services they consider less complex and more natural to nurses since they have all along been providing them. However, patients prefer doctors to manage HIV co-infections, adverse drug effects, and switching from the first line to the second line for patients who develop treatment failure, illnesses and services they perceive to be serious in nature. Van-Offenbeek, Sorge et al. (2009) in the Netherlands, and Rashid (2010) in the UK, similarly found that nurses are more acceptable to

stakeholders, including patients, if they work with patients requiring non-routine nursing-oriented tasks and routine medical-oriented tasks. Similar to arguments made by Van-Offenbeek, Sorge et al. (2009) that the less complex and more routine medical-oriented tasks are, the more they can be formalised for nurses to take on, some patients in the current study accepted nurses as providers of expanded HIV services based on their belief that HIV is a chronic disease condition that does not require making new diagnoses each time.

To minimise the community and patients' negative attitudes towards nurses as providers of expanded HIV clinical services, and to secure their buy-in and support for nurse-led ART clinics, policymakers and managers of health services will need to involve these key stakeholders early on in the design process of these clinics.

The results of this study seem to suggest strongly that the high demand for HIV services amidst the scarcity of doctors and community and patients' attitudes towards nurses as providers of ART could be the most important factors influencing the development and implementation of nurse-led ART clinics. This is especially so as the study findings have clearly demonstrated that these clinics are present in the absence of a supportive law, mostly due to demand of HIV services. This study has also shown that community and patients' acceptability of these clinics strongly determines their existence. Factors identified within the policy and funding environment which influence the development and implementation of effective nurse-led ART clinics are discussed in the next section.

9.3 Policy and Funding Environment

The current study has also identified legislation and regulation, and funding and cost implications as key factors within the policy and funding environment that have the second most significant external influence on the development and implementation of effective nurse-led ART clinics in Uganda, after the patient and community factors. These factors significantly influence the effectiveness of nurse-led ART clinics directly or indirectly through their effect on numerous factors within the wider health system, the healthcare facility, and personal nurse environments. The discussion of the effect of legislation and regulation on the effectiveness of nurse-led ART clinics follows.

Like prior studies in Uganda (USAID/HPI 2010, Dambisya and Matinhure 2012 , Baine and Kasangaki 2014, Spies, Gray et al. 2016) and elsewhere in SSA (Georgeu, Colvin et al. 2012, McCarthy, Voss et al. 2013, AMREF 2015, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016), the current study found that legislation and regulations addressing nurses' scope of practice continue to create barriers to the development and implementation of nurses' expanded HIV clinical roles as they are restrictive. This study found that due to these legislative and regulatory restrictions, nurses' scope of practice does not include the HIV services that nurses are currently providing to HIV-positive patients under task-shifting arrangements. The restricted scope of practice severely impedes the development and implementation of effective nurse-led ART clinics through limiting nurses' authority and autonomy to execute expanded HIV clinical tasks.

As observed elsewhere in SSA (Georgeu, Colvin et al. 2012, McCarthy, Voss et al. 2013, AMREF 2015, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016), it is apparent from the current study that in the absence of supportive legislation, nurse-led ART clinics are ineffective as they haphazardly happen without specific implementation plans and funding from the government and donors for key system supports. Internationally, earlier studies also demonstrated the negative impact of the lack of legislation including, among others, limited authority and autonomy for nurses to execute expanded clinical roles and limited funding for essential system supports (Woods 1998, Cameron and Masterson 2000, Irvine, Sidani et al. 2000, Marsden, Dolan et al. 2003).

The current study also revealed that the absence of a permissive legislation is intertwined with the lack of indemnity. In the absence of indemnity, nurses are reluctant to work in HIV clinics for fear of litigation in case they make a mistake during service delivery and for fear of nosocomial infections without workmanship compensation, a finding also reported by others (Baine and Kasangaki 2014, AMREF 2015). However, whereas the current study revealed that nurses were mostly concerned about litigation and indemnity issues for nurses in expanded HIV clinical roles, doctors were more worried about unsafe HIV services for patients resulting from the absence of legislation and regulatory mechanisms to ensure that nurses work within their scope of practice. The doctors' fears

of unlegislated and unregulated nurse-led HIV services harming patients have also been raised by other studies in SSA (Brugha, Kadzandira et al. 2010, Cameron, Gerber et al. 2012, Georgeu, Colvin et al. 2012, Dambisya and Matinhure 2012).

It is evident from the study that legislation will need to address issues of nurses' scope of practice in HIV care, autonomy, authority, funding and resources, indemnity, and accountability for mistakes made in the process of nurses' work, in the long term. In the absence of supportive legislation and regulatory mechanisms, the WHO (2008b) and other researchers (Vlasic, McKay et al. 1998, Irvine, Sidani et al. 2000) have advised ministries of health to use protocols and guidelines in the interim to support nurses to deliver expanded HIV services as policymakers continue to push for the legislative changes necessary for the sustainability of these clinics. Therefore, in the short term, health policymakers will need to develop guidelines to enable nurses to be quickly trained in HIV care and management. Closely interlinked with appropriate legislation is funding for the nurse-led ART programme, which is discussed next.

The high costs of running nurse-led ART clinics and the uncertainty about their source of funding have been identified by the current study as major barriers to the development and implementation of these clinics in Uganda. Like with participants in a study on task shifting in Uganda by Baine and Kasangaki (2014), the arguments by participants in the current study, especially policymakers, that costs related to running nurse-led ART clinics are exorbitant and thus unmanageable cannot be ignored. Participants in these two studies explained that costs of introducing nurse-led ART clinics would arise from salaries of nurses and new cadres, training and mentorship activities, infrastructure adjustments, functionalising referral systems, procuring tools and equipment, opportunity cost resulting from nurses spending longer consultation times, and over-reliance on laboratory investigations by nurses. Participants in the Baine and Kasangaki (2014) study went ahead and reasoned that it was indeed more costly to implement task shifting as recommended by the WHO than it was to recruit the unemployed healthcare workers that were prevalent in Uganda. Other studies in SSA have also found higher costs arising from training, mentorship, and system adaptations a major barrier to the effective development and implementation of nurse-led ART clinics (Zachariah, Ford et al. 2009, Barton, Fairall et al. 2013, Kredo, Adeniyi et al. 2014). In fact, Johns, Asfaw et al.

(2014) in Ethiopia and Barton, Fairall et al. (2013) in South Africa have found that costs of care associated with nurse-led ART clinics do not necessarily decrease.

On the contrary, a few participants in the current study believed that the cost of running nurse-led ART clinics could be lower with the reduced dependency on doctors who take longer than nurses to train and are expensive to employ, a finding supported by Callaghan, Ford et al. (2010) and Mdege, Chindove et al. (2013) in two separate systematic reviews on task shifting in SSA. However, against these arguments of reducing costs, Jacob, McKenna et al. (2015) observed that better patient outcomes associated with more skilled and experienced healthcare workers might offset the cost of employing them rather than employing lower cadre healthcare workers who may have poor patient outcomes.

Given the current funding gap for the health sector in Uganda, particularly against the backdrop that close to ninety percent of the national HIV programme budget is dependent on donor funding (MoH 2016), if nurse-led ART clinics are indeed more expensive than the traditional care, funding will present a significant barrier to their introduction. This study has also revealed that inadequate funding has a significant negative impact on the effectiveness of nurse-led ART clinics since it contributes to the unavailability of system supports that enable nurses to provide quality HIV services. To address the increased costs associated with task shifting, researchers have pointed to the need for long-term funding to ensure that these initiatives are effective and sustainable in SSA (Bluestone 2006, Campbell, Gibbs et al. 2008, Barton, Fairall et al. 2013, Emdin, Chong et al. 2013, Kredo, Adeniyi et al. 2014, Crowley and Mayers 2015). Donors, particularly PEPFAR and the GFATM, who fund more than eighty percent of the HIV response in Uganda (MoH 2016), need to be involved from the outset during the planning for these clinics if funding drawbacks associated with the introduction of nurse-led ART clinics are to be avoided. Factors within the wider health system environment that influence the development and implementation of effective nurse-led ART clinics are discussed in the next section.

9.4 Wider Health System Environment

This study found nurses' job descriptions, participatory planning and stakeholder involvement, nurses' pre-service education, the HIV in-service training course, support supervision and mentorship, and feedback on nurses' performance as factors within the wider health system environment that have the third most significant external influence on the development and implementation of effective nurse-led ART clinics. Other factors identified in this environment that have a significant influence on the development and implementation of effective nurse-led ART clinics include the effect of nurse-led ART clinics on nursing roles and professional aims, the effect of these clinics on other health service areas as well as the compensation issues of nurses who take up expanded HIV clinical roles. These factors are discussed in this section, one after another.

Like Zachariah, Ford et al. (2009) and Baine and Kasangaki (2014) have noted, the current study found that nurses' job descriptions that clearly define their scope of practice and thus the activities they have authority and autonomy to execute, are critical in the development and implementation of effective nurse-led ART clinics. However, this study found that nurses' current job descriptions are silent on their roles and responsibilities in HIV care leading to problems that arise from ambiguity of their work in HIV care. Worrisome though, is that these ambiguous job descriptions which negatively affect the performance of healthcare workers in expanded clinical roles appear to be widespread in Uganda (Buwembo, Munabi et al. 2014).

To improve the effectiveness of nurses in expanded HIV clinical roles, policymakers will need to redesign their job descriptions to include their proposed HIV clinical roles and responsibilities. Including nurses' expanded HIV clinical roles in nurses' job descriptions might help to reduce role ambiguity, increase their authority and autonomy to execute expanded HIV clinical tasks, and forestall role-related conflict. Through role clarification, the redesigned job descriptions could provide a partial solution to the lack of support from managers, doctors, and other healthcare team members to nurses in expanded HIV clinical roles emanating from role ambiguity. By clarifying nurses' work in HIV clinics, the redesigned job descriptions could also lessen nurses' work overload, which this study found to arise from managers of healthcare facilities allocating nurses

various tasks due to the confusion about nurses' roles and responsibilities in HIV clinics. For maximum benefit, policymakers will need to disseminate the new job descriptions to the managers of healthcare facilities and ensure that these managers pass on this information to all members of the healthcare team, including nurses in expanded HIV clinical roles. The importance of stakeholder involvement and participatory planning in enhancing the effectiveness of nurse-led ART clinics is discussed next.

A clear manifestation of lack of stakeholder involvement is the finding of the current study that some doctors and nurses believed that the GoU was wholeheartedly accepting task-shifting guidelines developed by international agencies and donors without fully analysing the human resource requirements to deal with the healthcare needs of Ugandans. The lack of stakeholder involvement also manifested itself through nurses' scepticism that the nurse-led ART programme was a ploy by the government to exploit nurses on the same salary scale instead of employing the proper people who could demand a higher salary. Feeling sidelined by the government as it did not consult them in the planning process for the introduction of nurse-led ART clinics, some doctors and nurses in the current study did not support these clinics, a finding similar to that of other studies on task shifting in Uganda (ECSA-HC 2010), and in Mozambique and Zambia (Ferrinho, Sidat et al. 2012). Indeed, Cummings and McLennan (2005), and Bryant-Lukosius and Dicenso (2004) in Canada have warned that the lack of stakeholder involvement results in their negative sentiments and resentment of otherwise useful health initiatives.

The current study identified HIV-positive patients, nurses, doctors, training institutions, donors, nursing and medical regulatory councils, and the ministries of health, public service and finance as the key stakeholders that policymakers will need to bring on board to secure their support for the nurse-led ART programme. Zachariah, Ford et al. (2009) have also argued that the involvement of key stakeholders during the introduction of new nursing roles addresses issues of role clarity, role boundaries, and role acceptance. Manley, Hamill et al. (1997) have specifically singled out the importance of involving nursing staff in the development of their advanced practice role, arguing that it enhances a culture of shared values and beliefs necessary for operationalising their expanded roles. Involving nursing associations and regulatory councils also addresses implementation

issues related to role standards, competencies, licensing, education, mentorship, and outcomes (Dunn and Nicklin 1995, Read 1999). The critical role played by nurses' pre-service education in the development and implementation of effective nurse-led ART clinics is discussed next.

This study identified nurses' pre-service education as critical in preparing student nurses for advanced clinical roles required in task shifting. Similar to the current study, Philips, Zachariah et al. (2008) and Shumbusho, Griensven et al. (2009) underscored the critical role of formal pre-service education in enhancing the confidence, competence, and autonomous practices of nurses in expanded clinical roles as well as in improving their relationship with medical staff. Philips, Zachariah et al. (2008) and Shumbusho, Griensven et al. (2009) advised that high-quality pre-service education and regular updates focusing on both theory and actual clinical practice will be key to the sustainability of task shifting.

Like in the current study, Harrowing (2009) found that nurses in Uganda complained that the pre-service education was deficient in empowering them to take on more challenging tasks like managing HIV-positive patients with co-morbidities. In the current study, nurses believed that their pre-service education does not promote clinical reasoning skills, undermining their competencies, self-confidence, and therefore their ability to undertake tasks such as making diagnoses and coming up with appropriate treatment plans, which involve analysing patient information. The inability of nurses' pre-service education to promote clinical reasoning skills was found to mainly result from inexperienced nurse tutors who emphasise theory at the expense of clinical practice, and from the task-oriented practices often displayed by role models in the wards. Similarly, Hagbaghery, Salsali et al. (2004) and Adib, Salsali et al. (2004) in their studies among Iranian nurses found that nurses lacked clinical reasoning skills due to the inappropriate curriculum content that emphasised theory at the expense of practice, and poor teaching methods.

Like earlier findings by Assefa, Pillay et al. (2014) in Ethiopia and by Zuber, McCarthy et al. (2014) in 13 countries in East, Central, and Southern Africa, including Uganda, the

current study found that nurses' pre-service education in Uganda had not been reformed to accommodate key skills required of nurses to take on advanced tasks despite the widespread existence of nurse-based task shifting. The finding of the current study that there are no immediate plans to reform the pre-service education of nurses to include skills required in task shifting is a major barrier as it threatens the sustainability of nurse-led ART clinics in Uganda. As Mullan and Frehywot (2007) and Shumbusho, Griensven et al. (2009) have advised elsewhere in SSA, policymakers will need to ensure that Uganda's nurses' education system is reviewed and reformed to enable it to equip student-nurses with key practical decision-making skills necessary for them to execute expanded HIV clinical tasks, if nurse-led ART clinics are to be viable. The critical role played by the HIV in-service training in enabling nurses to execute expanded HIV clinical tasks is discussed next.

The current study has identified the presence of the 14-day HIV in-service training course as a key strength in Uganda that will enable the MoH to build quickly nurses' competencies, self-confidence, and motivation to execute expanded HIV clinical tasks. This comprehensive competence-based HIV in-service training course uses skills stations and expert patient trainers to empower nurses to acquire clinical skills necessary for advanced tasks in HIV care. Through inter-professional training, this course also has the potential of promoting teamwork. This study identified teamwork to be critical for managing HIV-positive patients who require numerous services from providers with different skill sets. Similarly, Baine and Kasangaki (2014) in Uganda and Georgeu, Colvin et al. (2012) in South Africa have pointed out the critical role of HIV in-service training courses in equipping nurses with the required skills to execute expanded HIV clinical tasks. In the same way, Callaghan, Ford et al. (2010) in an earlier systematic review of task-shifting for HIV treatment and care in Africa, highlighted the critical role of HIV in-service training in increasing nurses' competence, efficiency, and effectiveness in HIV service delivery. Beyond improving healthcare workers' competencies, Willis-Shattuck, Bidwell et al. (2008) in a systematic review on motivation and retention of healthcare workers in developing countries found that in-service training opportunities significantly improve healthcare workers' motivation. The availability of HIV in-service training has also been found to improve the acceptability of nurse-based task shifting by patients, community, and other stakeholders (Georgeu, Colvin et al. 2012, Cohen, Lynch et al. 2009). Studies conducted in industrialised

countries have also found that in-service training increases nurses' work motivation, competencies, and self-confidence, and improves their individual achievements at executing expanded roles (Mills and Fitzgerald 2010, Nolan, Deehan et al. 2012, Rydenfält, Joansson et al. 2012, Hoonakker, Carayon et al. 2013).

Despite the current study identifying numerous strengths of the HIV in-service training course in Uganda, it also identified limitations with it, making it inefficient and ineffective. This study found that the inefficiencies and ineffectiveness with the course result from the lack of transparent selection criteria and database for participants on the course. In their absence, training openings for many healthcare workers are reduced since managers of healthcare facilities tend to favour a few of them to attend the course more than once with the sole intention of providing them with an opportunity to get out-of-the-pocket allowances offered during the training.

Another limitation with the HIV in-service training course identified by the current study is the inability of this one course to address the varied needs of different healthcare cadres and its limited duration, which makes it difficult to cover adequately the training needs of nurses in expanded HIV clinical roles. However, contrary to these concerns, inter-professional education has been advocated for and promoted as a strategy to facilitate effective teamwork (van-Soeren and Micevski 2001, DiCenso, Bryant-Lukosius et al. 2010, Reeves, Perrier et al. 2013).

Furthermore, if concerns of doctors in the current study that not all nurses who undertake the HIV in-service training course have the intelligence and motivation to become competent ART providers are indeed found to be true, policymakers and managers of healthcare services will need to choose nurse candidates for this course with such considerations in mind. Another concern revealed by the current study that policymakers will need to address is the high staff attrition rates. These high attrition rates can have severe negative effects on the functioning of nurse-led ART clinics as it is impossible for the government to train enough nurses and other healthcare providers to replace those who keep on leaving. Callaghan, Ford et al. (2010) and Sodhi, Banda et al. (2014) also noted the negative effects of staff attrition on the sustainability of task shifting initiatives.

Callaghan, Ford et al. (2010) went ahead to advise governments considering the introduction of task shifting to design measures that limit staff attrition.

Given the importance of the HIV in-service training in building nurses' competencies, motivation, and self-confidence in HIV care, policymakers will urgently need to develop guidelines and plans to support the role out of the IMAI course for nurses going to run nurse-led ART clinics. However, for the HIV in-service training course to be efficient and effective, strategies will be required to forestall the negative effects arising from the limitations identified with it in this study. For instance, policymakers and managers of health services will need to consider developing other tailor-made courses to take care of the varied training needs of the different healthcare workers involved in nurse-led ART clinics rather than relying on one course. They will also need to develop clear selection criteria for nurses and other healthcare workers to attend the HIV in-service training. Furthermore, they will need to develop a database to capture all those healthcare workers already trained to avoid double training of the same individual. Exploring innovative training approaches to improve cost-effectiveness will also be required. Such innovative approaches could include online training, on-site training and mentorship practicum, off-site training, and combinations of them. Interventions to curb the high staff attrition rates could include improving working conditions for nurses in such ways as providing them with a clean and well-lit working environment, tools and equipment, and commensurate remuneration. The importance of support supervision, clinical mentorship, and feedback on performance on the effectiveness of nurse-led ART clinics is discussed next.

Similar to previous studies on task shifting in Uganda (Dambisya and Matinhure 2012 , Baine and Kasangaki 2014), the current study has identified support supervision, mentorships, and feedback on performance as key capacity-building strategies that enable nurses to acquire the necessary competencies, self-confidence, and motivation to execute expanded HIV clinical tasks. Like in these studies (Dambisya and Matinhure 2012 , Baine and Kasangaki 2014), the current study has revealed that support supervision, mentorships, and feedback on performance, if they happen at all, are unsystematic, irregular, unsupportive, and often done hurriedly in most public healthcare facilities, particularly in those without donor support. Echoing studies by Dambisya and Matinhure (2012) and Baine and Kasangaki (2014) in Uganda, the current study has

identified problems with support supervision and mentorships to arise mainly from lack of resources for transport and lack of money for allowances to the supervisors. Other researchers elsewhere in SSA have also highlighted the critical role played by ongoing support supervision and clinical mentorships in building nurses' competencies, confidence, and motivation to provide safe HIV services, and have mentioned similar logistical challenges (Stringer, Zulu et al. 2006, Bedelu, Ford et al. 2007, Miles, Clutterbuck et al. 2007, Griensven, Naeyer et al. 2008, Hulela, Puvimanasinghe et al. 2008, Van-Griensven, De-Naeyer et al. 2008, Bussmann, Ndwapi et al. 2009, Morris, Chapula et al. 2009, Shumbusho, Griensven et al. 2009, Zachariah, Ford et al. 2009, Georgeu, Colvin et al. 2012, Munga, Kilima et al. 2012, Davies, Homfray et al. 2013, Emdin, Chong et al. 2013, Nyasulu, Muchiri et al. 2013, O'Malley, Asrat et al. 2014).

In concurrence with the recommendations made by Georgeu, Colvin et al. (2012) in South Africa, the participants in the current study, particularly policymakers, underscored the need to build the knowledge, skills, and motivation as well as support the few supervisors, who were already said to be experiencing heavy workloads, to perform their supportive duties effectively. Indeed, without supporting the supervisors to provide adequate supportive supervision and mentorship, numerous researchers in SSA have warned of a danger of shifting tasks to ill-prepared nurses resulting in dire consequences for patients as they might receive unsafe services from them (Orner, Cooper et al. 2011, Munga, Kilima et al. 2012, Baine and Kasangaki 2014, Smith, Deveridge et al. 2014, Spies, Gray et al. 2016).

Due to the logistical challenges currently faced by Uganda's public health system, policymakers will need to identify and test innovative models for providing support supervision, mentorships, and feedback on performance to nurses in expanded HIV clinical roles. Wherein regular in-person mentorships might not be possible, other cheaper options like the telephone consultation model already being used at The AIDS Treatment Information Centre in Uganda could be considered (Ario 2014). Exploring the use of self-assessment, where nurses in expanded HIV clinical roles benchmark their performance against a brief checklist derived from national standards, is another option. The senior-midwife-to-junior-midwife mentorship model, which has been implemented successfully in Uganda's Prevention of Mother-to-Child Transmission of HIV

programme, is yet another option that could be modified to a senior-nurse-to-junior-nurse mentorship model and tested for wide-scale use. The effect of nurse-led ART clinics on other health service areas is discussed next.

This study also revealed fears among policymakers and officials from the UMDPC, that the large-scale development of nurse-led ART clinics purely for medical substitution for HIV care could distract the already overstretched nursing workforce from providing other essential services, a finding echoing that of Davies, Homfray et al. (2013) in South Africa. In a qualitative study of nurse and manager perceptions of nurse-initiated and -managed ART implementation in South Africa, Davies, Homfray et al. (2013) concluded that ensuring sustainability will be a daunting task when nurses take on expanded HIV clinical roles without employing other healthcare workers and lay providers to take on their previous work. Assefa, Kiflie et al. (2012) and van-Rensburg, Steyn et al. (2008) have also argued that in most countries in SSA, simply allocating ART tasks to non-physicians can run down the already limited resources available for general health services. Likewise, Biesma, Brugha et al. (2009) in a review of country-level evidence in middle- and low-income countries have highlighted the adverse impact of disease-specific focus programmes, such as those related to the scale-up of HIV activities, on the broader health system goals. Such fears of nurse-led ART clinics drawing nurses from other essential health service areas will not only dissuade key stakeholders from supporting the introduction of these clinics but also disrupt the delivery of essential services. Disrupting other service areas is especially important in Uganda which is already experiencing a severe shortage of nursing staff to fulfil its public health mandate (MoFPED 2013, Spies, Gray et al. 2016).

During the design of nurse-led ART clinics, policymakers should also seriously consider the concerns expressed of nurses that taking on medical roles in HIV care would negatively affect their traditional caring roles, because ignoring them could discourage nurses from working in expanded HIV clinical roles. Nurses in Uganda (Spies, Gray et al. 2016) and internationally (Robinson 1993, MacAlister and Chiam 1995, Tye and Ross 2000), have raised similar concerns about the negative effect of expanded nurse roles on nurses' professional aims and goals, mentioning it as a major demotivator for nurses to work in clinical roles. Fears about nurses in expanded clinical roles becoming

medicalised and losing their caring focus, a fundamental characteristic of the nursing profession, have also been expressed (Robinson 1993, MacAlister and Chiam 1995, Tye and Ross 2000).

The development of a more integrated nurse-led service with both medical and nursing components might be a more realistic option for Uganda if weakening the capacity of the public health system to provide a comprehensive set of health services required by the population, and preventing nurses from losing their caring professional role are to be avoided. This recommendation is especially important since holistic care is not only a foundational concept of nursing but also a value appreciated by most nurses and patients in the current study. The effect of non-commensurate pay for nurses in expanded HIV clinical roles on the effectiveness of nurse-led ART clinics is discussed next.

This study found the expectation by the government that nurses should execute expanded HIV clinical tasks while keeping them on the same salary as their colleagues in general nursing to cause much dissatisfaction among nurses, with some of them refusing to work in HIV clinics altogether. Studies on task shifting in Uganda (Babigumira, Castelnuovo et al. 2009, Dambisya and Matinhure 2012, Baine and Kasangaki 2014, Spies, Gray et al. 2016) and elsewhere in SSA (Bärnighausen, Bloom et al. 2007, Stevens, Mathijs et al. 2009, Emdin and Millson 2012, Ferrinho, Sidat et al. 2012, Munga, Kilima et al. 2012, Mwai, Mburu et al. 2013) have also found the lack of commensurate remuneration, incentives, and career promotion pathways to discourage nurses from taking up expanded HIV clinical tasks. Belayneh, Tekola et al. (2009), in Ethiopia, as well found that the retention of professional or lay healthcare workers in task-shifted clinical work was difficult without fundamentally improving their remuneration. It is evident from this study that the lack of commensurate compensation and incentives for nurses in expanded HIV clinical roles not only causes major challenges to attracting nurses to expanded HIV clinical work, but also to retaining, and improving their performance. Policymakers will thus need to find resources for a fairer compensation and come up with other incentives such as developing career plans for nurses and other healthcare workers who take on extra roles and responsibilities in nurse-led ART clinics. The influence of factors within the healthcare facility environment on the development and implementation of effective nurse-led ART clinics is discussed in the next section.

9.5 Healthcare Facility Environment

The current study has revealed clarity of nurses' roles and responsibilities in HIV care, manager's support, doctor's support, teamwork, HIV care clinical guidelines and protocols, equipment, supplies, drugs, working space, referral systems, staffing levels, and workload, nurses' authority and autonomy, as factors within the healthcare facility environment that have a significant influence on the development and implementation of effective nurse-led ART clinics. These factors have the most direct external effect on nurses' ability to execute expanded HIV clinical roles since they form the immediate working environment for them. Each of these factors, acting as either a facilitator or barrier to nurses' ability to execute expanded HIV clinical tasks, is discussed in this section, starting with the clarity of nurses' roles and responsibilities in HIV care.

This study found the absence of well-defined goals and definition of nurses' roles and responsibilities in HIV care to hinder nurses' ability to execute expanded HIV clinical roles. In the absence of well-defined goals and definition of nurses' roles and responsibilities in HIV care, managers, healthcare team members, and nurses in expanded HIV clinical roles had different expectations of nurses' work in HIV care, causing conflict amongst them. This study also found that the varied expectations of nurses' work in HIV care results in increased workload for nurses as their managers allocate nurses administrative and other non-nursing tasks that nurses in this study believed less-trained personnel could perform. This study found that the resultant conflict and high workloads frustrate and de-motivate nurses, with many of them refusing to work in HIV clinics. It is apparent from this study that nurses' frustrations and demotivation are worsened by their belief that the government is deliberately refusing to define nurses' roles and responsibilities in HIV care with the sole intention of continuing to exploit nurses by adding them new tasks instead of employing other paid staff. Orner, Cooper et al. (2011) in South Africa similarly found that nurses in expanded HIV clinical roles experienced conflicts, frustrations, and demotivation resulting from role ambiguity.

Internationally, the lack of role clarity continues to be a major barrier to expanding nurse roles. For instance, Donald, Bryant-Lukosius et al. (2010) in a comprehensive study

conducted throughout Canada, where nurses in expanded roles have been in place since the 1960s, found that a lack of role clarity had continued to pose barriers to the integration of nurses in expanded roles. Similarly, Lloyd (2005), in a systematic review to identify barriers to advanced practice nurse role development, identified role ambiguity as the most important factor influencing role implementation. Like the current study, both Lloyd (2005) and Donald, Bryant-Lukosius et al. (2010) found that role ambiguity resulted from confusion among stakeholders about the objectives, scope of practice, responsibilities, and anticipated outcomes of the expanded nurse roles.

It is logical to believe that defining and communicating nurses' roles and responsibilities in HIV care will ensure that all stakeholders have consistent expectations of nurses' work in HIV care and is likely to forestall problems emanating from the lack of role clarity. Having clear roles and responsibilities for nurses in HIV care might also allay fears expressed by nurses that the government, bent on exploiting nurses, was deliberately refusing to define their roles in HIV care. As suggested in the literature (Read 2001, Roberts-Davis & Read 2001, Collins et al. 2001, Marsden et al. 2003, Robinson & Cottrell 2005), the MoH could clarify nurses' work in HIV care by developing national standards and clear job descriptions with definitions of roles and responsibilities for nurses in HIV care, based on defined patient and healthcare system needs. The discussion on the important role played by managers of healthcare facilities in enabling nurses to execute expanded HIV clinical tasks follows.

Nurses in the current study identified managers' support as crucial in enabling nurses to take on and successfully execute expanded HIV clinical tasks, a finding also supported by Nankumbi, Groves et al. (2011) in a study on task shifting in Uganda. In agreement with the literature on task shifting in SSA (Selke, Kimaiyo et al. 2010, Nankumbi, Groves et al. 2011, Georgeu, Colvin et al. 2012, Davies, Homfray et al. 2013), nurses in the current study perceived managers' support to be present only when their managers provided them with time and opportunity to work in HIV clinics, emotional and material support to do their work, and opportunities for financial supplementation. Echoing the findings of Stein, Lewin et al. (2008) and Georgeu, Colvin et al. (2012) in South Africa, most nurses in the current study believed that their managers did not support them enough in their endeavour to provide HIV services, even when they were aware that

some of their expectations were unrealistic. For instance, nurses in the current study expected their managers to supplement their income, yet they knew that it was beyond their managers' influence to do so. Hajbaghery and Salsali (2005) as well found that Iranian nurses expected their managers to find innovative ways of providing them with financial and emotional supports, with most nurses also feeling that their managers did not support them. The expectation by nurses that their managers should supplement their income is surprising but insightful since inattention to it can discourage and demotivate nurses from working in HIV clinics significantly.

Significant also is the finding by the current study that managers of healthcare facilities did not allocate nurses time and opportunity to work in HIV clinics. If nurses are to provide expanded HIV clinical services, they must have time and opportunity to do so. This non-allocation of time and opportunity to nurses is a major barrier to the functioning of nurse-led ART clinics especially that it was reportedly widespread in Uganda. This finding is not unique to Uganda as international literature has also highlighted the critical role played by managers in granting nurses time and opportunity to practice in expanded clinical roles (McFadden and Miller 1994, Woods 1998, Marsden, Dolan et al. 2003, McElhinney 2010) and to act autonomously (Gagnon, Bakker et al. 2010).

In the current study, managers' unsupportive attitude towards nurses' expanded HIV work is believed to originate from the vertical approach in which the HIV programme was introduced within the Ugandan healthcare system, causing many managers difficulties of conceptualising HIV services as part of the routine healthcare package. Policymakers will need to bring managers on board to consider HIV services as part of the national healthcare package, possibly through sensitisation activities. Bringing managers on board is particularly important because in the absence of supportive legislation and job descriptions, it is at their discretion to allocate nurses time and opportunity, as well as to provide them with the necessary system and emotional support to be able to execute expanded HIV clinical tasks. As nurses in this study mentioned, other researchers have alluded to the importance of managers' support in increasing nurses' job satisfaction and autonomy, improving role clarity, encouraging innovation,

reducing role conflict, and reducing role overload (McFadden and Miller 1994, Sanchez, Lee et al. 1996, Read 1999, Guest, Peccei et al. 2001).

Like Willis-Shattuck, Bidwell et al. (2008) in a review on healthcare worker motivation in SSA found, nurses in the current study complained that their managers lacked adequate management and leadership skills. In agreement with other authors (Nankumbi, Groves et al. 2011, Davies, Homfray et al. 2013), participants in the current study advised of the need to build managers' competencies and improve their motivation to effectively manage the human and material resources associated with the nurse-led ART programme. Short-term training and mentorship programmes such as the Makerere University and Centres for Disease Control course for managers of health services provided by Makerere University School of Public Health in Kampala, Uganda, could be a good starting point to improve management skills of the managers. Policymakers and managers of healthcare services will also have to find innovative ways of tackling nurses' low-income levels resulting from their low salaries and the lack of time and opportunity to work in HIV clinics if they are to motivate nurses to execute expanded HIV clinical tasks. The discussion on the importance of doctors' support in enhancing nurses' ability to execute expanded HIV clinical roles follows.

This study found doctors' support crucial in enabling nurses to execute expanded HIV clinical tasks, especially during the early stages when nurses are still novices. This study found that nurses in expanded HIV clinical roles relied on doctors for permission to execute expanded HIV clinical tasks, for support to develop the required competencies, and for help to manage complicated patients, affirming the importance of doctors' support in the proper functioning of nurse-led ART clinics. This finding is in agreement with those of other studies in SSA that doctors' support is critical for nurses to acquire the necessary competencies, self-confidence, motivation, authority, and autonomy to execute expanded HIV clinical tasks (Assefa, Kiflie et al. 2012, Fairall, Bachmann et al. 2012, Georgeu, Colvin et al. 2012, Iwu and Holzemer 2014, Crowley and Mayers 2015, Mabelanea, Marincowitz et al. 2016). Through mentorships, doctors help nurses to develop the necessary competencies, self-confidence, and motivation to execute expanded HIV clinical tasks, and by granting nurses permission to execute expanded roles, doctors' support improves nurses' authority and autonomy to execute expanded

HIV clinical roles (Assefa, Kiflie et al. 2012, Fairall, Bachmann et al. 2012, Georgeu, Colvin et al. 2012, Iwu and Holzemer 2014, Crowley and Mayers 2015, Mabelanea, Marincowitz et al. 2016).

However, this study also found that doctors' belief that nurses lack the capacity to take on expanded clinical roles is one major obstacle to independent expanded nurse practice. Indeed, some doctors in this study opposed nurses taking on expanded HIV clinical roles, as they believed that nurses lacked the intelligence and competencies to manage complex illnesses often experienced by HIV-positive patients. Likewise, in an international literature review on strategies to overcome barriers to effective nurse practitioner and physician collaboration, Clarin (2007) concluded that gaining doctors' support was difficult because some doctors believed that nurses lacked competencies to provide quality care. Similarly, in SSA, tensions between nurses in expanded clinical roles and doctors arising from professional boundaries, dominance, and power have been reported (Callaghan, Ford et al. 2010, Gilbert 2013, Crowley and Mayers 2015).

In Uganda, doctors' opposition to nurses taking up expanded HIV clinical roles could also be due to their lack of awareness of nurses' work in HIV care, a common cause of doctors' resentment to nurses' advanced roles in the literature (Azzi 1998, Way, Jones et al. 2001, Way, Jones et al. 2001, Wilson, Pearson et al. 2002, Long, McCann et al. 2004, Marsden and Street 2004, Bailey, Jones et al. 2006, Main, Dunn et al. 2007, Legault, Humbert et al. 2012). Doctors' opposition is especially of great concern since this study found that doctors in Uganda have enormous power over other healthcare providers including nurses, accentuated by a hierarchal traditional medical model of practice. In this study, the effect of doctors' power on the effectiveness of nurse-led ART clinics manifested itself through the finding that whenever doctors' support was present, it facilitated nurses' expanded clinical work in HIV care, and whenever it was absent, it impeded it.

This study also found supremacy fights between junior doctors and nurses in expanded HIV clinical roles a significant barrier to the smooth running of nurse-led ART clinics in Uganda. It was revealed that these fights arose from senior nurses' refusal to consult with

junior doctors on patient-related issues as they considered them novices, thus unhelpful. The junior doctors, feeling undermined, in turn stubbornly refuse to cooperate with nurses in expanded HIV clinical roles by not heeding the advice given to them by nurses. These junior doctors, in an attempt to assert their authority, take unilateral patient management decisions, at times compromising patient safety. This ego-related finding is of great concern since the supremacy battles are bound to happen repeatedly each passing year as new junior doctors join service.

In concurrence with the findings of other studies in SSA (Assefa, Kiflie et al. 2012, Georgeu, Colvin et al. 2012, Iwu and Holzemer 2014, Crowley and Mayers 2015, Mijovic, McKnight et al. 2016), this study found that some doctors supported nurses in their pursuit of providing expanded HIV clinical services to their patients. It appears, therefore, that the personality of individual doctors rather than their professional group could be a key determinant of their decision to either support or oppose nurses in expanded HIV clinical tasks. Interestingly also, this study found that even those doctors who initially strongly opposed nurses taking up expanded HIV clinical tasks seemed to support the initiative if medical authority in decision-making could be maintained, particularly for tasks related to the prescription of medicines and management of complicated cases. Snelgrove and Hughes (2000) in Australia and Wilson, Pearson et al. (2002) in the UK also found that doctors were only willing to pass on routine tasks to nurses but wanted to retain exclusively prescribing and diagnostic rights and medical authority in decision-making.

Due to the enormous power doctors hold over other healthcare workers and the critical role they play in enabling nurses to execute expanded HIV clinical roles, policymakers and managers of health services will need to devise ways of bringing doctors on board as key stakeholders whose buy-in and support is imperative to the success of nurse-led ART clinics. One suggestion of gaining doctors' support that emerged from this particular study and the literature is to ensure that medical authority is maintained at nurse-led ART clinics. Another suggestion is to involve doctors in planning, support supervision, and mentorships of nurses in expanded HIV clinical roles. Besides doctors' support, teamwork was found by the current study to be critical in enabling nurses to execute expanded HIV clinical tasks and is discussed in the next section.

The current study identified the support from other members of the healthcare team as critical in enabling nurses to manage the HIV disease effectively. This finding is in agreement with observations of Georgeu, Colvin et al. (2012) and Davies, Homfray et al. (2013) in South Africa who also argued that the management of HIV, a chronic condition, requires teamwork as it involves a significant amount of coordination and consultation with others to ensure continuity of care. In this study, the importance of teamwork in HIV care manifested itself through the finding that doctors who worked as individuals missed significant patient-related factors, which resulted in dire complications for their patients. Like the current study, international literature has highlighted improvements in patient safety arising from nurses in expanded clinical roles working well with other members of the healthcare team (Rafferty, Ball et al. 2001, Wieck, Oehler et al. 2004, Robinson and Cottrell 2005, McElhinney 2010). Similar to this study, other researchers have also found that teamwork increases the job satisfaction of nurses in expanded roles (Adams and Bond 2000, Jackson 2005).

Although this study found that the lack of teamwork arose mostly from doctors' opposition to nurses working in expanded HIV clinical roles due to professional protectionism, it also found that it arose from nursing colleagues strongly resisting expanded HIV clinical roles for nurses because they felt demeaned if they took orders from fellow nurses as if they were doctors. Other researchers have also reported resistance to nurses taking up expanded clinical roles from their nursing colleagues and doctors (Read 2001, Skillen, Anderson et al. 2001, McElhinney 2010). Internationally, the lack of teamwork and the non-supportive attitudes of other healthcare team members towards nurses in expanded clinical roles has also been attributed to role ambiguity, role conflict, and lack of role models, leading to misconceptions and differing expectations of roles (Glen and Waddington 1998, Collins, Jones et al. 2000, Read, Jones et al. 2001, Norris and Melby 2006, Willard and Luker 2007, McElhinney 2010). In fact, some authors in SSA have warned that countries considering task shifting policies should anticipate disruptions in the healthcare team dynamics as some healthcare professionals may vehemently oppose it due to fear of these new cadres in task-shifted roles challenging their authority on tasks originally reserved for them (Tantchou-Yakam and

Gruénais 2009, Callaghan, Ford et al. 2010, Georgeu, Colvin et al. 2012, Davies, Homfray et al. 2013).

Callaghan, Ford et al. (2010) have advised that policymakers should anticipate and minimise the adverse effects of team disruptions created by task shifting by developing clear definitions of roles and responsibilities for both existing and new healthcare workers involved in task shifting. Another way of improving teamwork that appears to emerge from the findings of the current study is to use the USAID-supported quality improvement initiative, which promotes a culture of teamwork and innovative problem solving at the healthcare facilities. This initiative, reported to produce positive team dynamics, could be adapted and scaled up during the implementation of nurse-led ART clinics. The critical role clinical guidelines and protocols play in supporting nurses in expanded HIV clinical roles to make sound treatment decisions for their patients is discussed next.

The current study has also acknowledged the importance of HIV clinical guidelines and protocols in enabling nurses to execute HIV clinical tasks safely and confidently, especially since nurses were believed to have less clinical acumen to work without this guidance. Other researchers in SSA (Rycroft-Malone, Fontenla et al. 2008, Stein, Lewin et al. 2008, Colvin, Fairall et al. 2010, Georgeu, Colvin et al. 2012, Colvin, de-Heer et al. 2013) have also found nurse-specific guidelines critical in increasing nurses' confidence to execute expanded HIV clinical tasks, as well as in promoting their acceptability by stakeholders as providers of expanded HIV clinical services. However, the current study found that HIV clinical guidelines and protocols were lacking at most healthcare facilities in Uganda, which, in turn, limited nurses' ability to execute expanded HIV clinical tasks confidently and safely.

Also, the concerns raised by some doctors in the current study about what nurses in expanded HIV clinical roles would do if they came across patients who could not be managed within the available treatment protocols will need the attention of policymakers. The inability of managing all patients using the available protocols is especially worrisome in the light of the absence of a robust consultation and referral

systems in many healthcare facilities in Uganda to enable nurses in expanded HIV clinical roles to refer patients they cannot manage using the prescribed treatment guidelines. However, it is apparent from the results of this study and in the literature (Colvin, Fairall et al. 2010) that working strictly within prescribed clinical guidelines and protocols not only enhances nurses' self-confidence and motivation to execute expanded HIV clinical tasks but also improves their acceptability to patients and other stakeholders as providers of expanded HIV clinical services. Considering the advantages of HIV clinical guidelines and protocols, policymakers will need to disseminate them widely. The importance of infrastructure, tools, and medicines in enhancing nurses' ability to execute expanded HIV clinical roles is discussed next.

The presence of a well-functioning healthcare system with adequate logistics including medicines, basic equipment, supplies, and working space, has been found by the current study to be a prerequisite for nurses to execute expanded HIV clinical tasks well. Yet similar to previous studies on task shifting in Uganda (Nankumbi, Groves et al. 2011, Baine and Kasangaki 2014, Spies, Gray et al. 2016), and elsewhere in SSA (Travis, Bennett et al. 2004, Fatti, Grimwood et al. 2010, Georgeu, Colvin et al. 2012, Davies, Homfray et al. 2013, O'Malley, Asrat et al. 2014), the current study found that most lower-level healthcare facilities in Uganda lack these necessary logistics, which severely impedes the effective functioning of nurse-led ART clinics.

This study found that in the absence of communication facilities such as telephones and internet, nurses in expanded HIV clinical roles were unable to consult with doctors about difficult patients they met, which exposed such patients to the danger of receiving unsafe care or not receiving the necessary care at all. Similarly, in the absence of weighing machines, nurses in expanded HIV clinical roles could not make out correct medicine dosages, posing a danger of creating resistance to medications in cases of medicine under-dose, or creating adverse effects in cases of overdose. Further, in the absence of functional laboratories, nurses in expanded HIV clinical roles could not make sound clinical decisions for their patients.

Like other studies in SSA (Travis, Bennett et al. 2004, Fatti, Grimwood et al. 2010, Georgeu, Colvin et al. 2012, Davies, Homfray et al. 2013, O'Malley, Asrat et al. 2014), the current study has revealed that the severe shortage of clinic space, also accentuated at lower-level healthcare facilities, as well severely constrains the proper functioning of nurse-led ART clinics. The inadequate clinic space at these facilities that limits patients' privacy and confidentiality during consultations is a serious concern, as patients are likely to shun nurse-led ART clinics. This limited space also leads to overcrowding at HIV clinics, exposing nurses and other members of the healthcare team to nosocomial infections, which discourages many of them from working in these clinics.

The current study has also identified the limited variety of medicines available at lower healthcare facilities as a major impediment to the proper functioning of nurse-led ART clinics. It was revealed that the variety of medicines available at each healthcare facility level is determined by the national drug list used by the National Medical Stores to supply drugs. This drug list restricts the types of medicines, including those for HIV, supplied at lower-level healthcare facilities. In the absence of HIV medicines, nurses are compelled to refer patients they could otherwise have managed, which defeats the purpose of nurse-led ART clinics.

Because nurses in expanded HIV clinical roles cannot provide effective patient care without the necessary logistics, medicines, equipment, and infrastructure supports, the finding of the current study that these supports were lacking at most healthcare facilities in Uganda casts doubt on the capacity of the country's public health system to effectively introduce and run nurse-led ART clinics. Thus, such supports should be a central component of any plan to develop nurse-led ART clinics in Uganda. That said, this study also revealed that even if nurses in expanded HIV clinical roles had all the necessary resources, they would still meet patients with complex HIV-related disease conditions they could not manage on their own and whom they would need to refer for varied reasons. The role of an effective referral system in the development and implementation of effective nurse-led ART clinics is discussed next.

The importance of an effective referral system in ensuring that nurses in expanded HIV clinical roles provide comprehensive and safe services for HIV-positive patients has been highlighted by the current study, with indications that patients will face dire consequences in its absence. Likewise, Kloos (1990) and Stuart, Harkins et al. (2005) found that unsatisfactory treatment outcomes for patients resulted from poor links between the healthcare workers of different levels of qualification, and between facilities with different levels of expertise. This study has found that nurses in expanded HIV clinical roles frequently face difficulties whenever they come face-to-face with patients requiring referral, echoing previous studies in SSA (Provan, Sebastian et al. 1994, Kitahata, Tegger et al. 2002, Schneider, Blaauw et al. 2008, MSF 2009, Davies, Homfray et al. 2013). The difficulties nurses face with patient referral arise from lack of transport to move patients between referral points, inappropriate referral forms that do not facilitate communication in both directions, lack of telephones and internet for consultations, lack of appropriate healthcare professionals to refer patients to, and lack of functional diagnostic equipment at higher healthcare facilities.

This study also found that in the absence of an effective referral system, nurses in expanded HIV clinical roles feel isolated, helpless, and demotivated when they cannot receive the help they need to manage some of their patients, discouraging many of them from working in HIV clinics. A notable finding of this study is that nurses as providers of expanded HIV clinical services might be more acceptable if patients and the community are assured that they will only work within clear and strict guidelines with regulatory mechanisms to ensure that they manage only uncomplicated disease conditions, with consultation facilities, and referral pathways in place. Furthermore, it found that nurses are likely to be acceptable as providers of expanded HIV services if the community and patients are assured that doctors will be available for those nurses to consult with should a need arise. The effect of poor staffing levels and high workloads on the effectiveness of nurse-led ART clinics is discussed next.

Ironically, the poor staffing levels coupled with a high number of HIV-positive patients requiring ART has necessitated the introduction of nurse-led ART clinics, yet the same factors were found by the current study to be major barriers to their effective functioning. The finding that the severe shortage of nurses in Uganda was already creating challenges

in the provision of essential health services to the Ugandan population brings into question the rationale of assigning these already overstretched nurses more tasks in HIV care. Assigning the few overworked nurses additional roles in HIV care could undermine their productivity and compromise service quality. Indeed, some authors on task shifting in Uganda (Arem, Nakyanjo et al. 2009, Baine and Kasangaki 2014, Spies, Gray et al. 2016), and elsewhere in SSA (Davies, Homfray et al. 2013, Emdin, Chong et al. 2013) have warned that without shifting some of the nurses' current tasks to lower-level healthcare workers, patient outcomes may be compromised if the already overworked nurses are assigned extra tasks in HIV care. A commonly cited example in the literature where workloads of nurses in expanded HIV clinical tasks stayed manageable only after some of the tasks previously performed by nurses were shifted to lay providers is the nurse-led ART delivery model in Lusikisiki in South Africa (Bedelu, Ford et al. 2007). The authors argued that increased access to treatment would have been impossible in their programme without bringing on board additional lay workers to take over some of the work previously done by nurses (Bedelu, Ford et al. 2007).

Surprisingly, some of the nurses in the current study who complained of high workloads in HIV clinics causing them stress went ahead and dismissed the role of lay providers in HIV care, saying that they required much time to supervise. Even though other studies in SSA have also found that higher-level healthcare workers resist task shifting due to increased workload related to supervision roles (Zachariah, Ford et al. 2009, Emdin, Chong et al. 2013, Crowley and Mayers 2015), it is not clear if the dismissal of the role of lay providers by nurses in this study was due to professional turf protection but disguised as fear of increased supervisory demands.

With the scarcity of nurses in Uganda's public health system (MOH 2015), transferring HIV clinical tasks from doctors to nurses without a corresponding increase in the number of nurses and other healthcare providers will definitely have dire consequences for other health service areas. Policymakers must thus consider employing other healthcare workers, including nurses and lay providers, to assume some work currently done by nurses selected to take up expanded HIV clinical tasks to increase the possibility of nurses taking up expanded HIV clinical roles. They could also consider promoting patient self-management, through expert client groups, a strategy already used in the

scale-up of the ART programme in Uganda to increase the pool of service providers. This study has also identified nurses' authority and autonomy as factors with the healthcare facility that influence the development and implementation of effective nurse-led ART clinics, and they are discussed next.

The current study has revealed nurses' authority and autonomy as crucial in empowering nurses to execute expanded HIV clinical roles and in increasing their job satisfaction. Likewise, numerous international studies have asserted that authority and autonomy are the strongest predictors of nurses' ability to take on complex tasks, and improve their job satisfaction and retention (Boyle, Bott et al. 1999, Burnard, Morrison et al. 1999, Chaboyer, Williams et al. 1999, Nolan, Lundh et al. 1999, Richard 1999, Wade 1999, O'Rourke, Allgood et al. 2000, Upenieks 2000, Chaboyer, Najman et al. 2001, Finn 2001, Mrayyan 2004).

However, this study has revealed numerous factors within the patient and community, policy and funding, wider health system, healthcare facility, and personal nurse environments, as well as nurse-level outcomes as influencing nurses' authority and autonomy to execute expanded HIV clinical roles. As already discussed throughout this chapter, examples of factors identified by the current study limiting nurses' authority and autonomy to execute expanded HIV clinical tasks include non-permissive legislation, restrictive and vague job descriptions, hierarchical management structures at healthcare facilities, non-supportive managers, and doctors' dominance, the lack of self-confidence, and low competence, to mention a few.

Importantly, the findings of this study strongly suggest that nurses' authority and autonomy are prerequisites without which nurses are unable to execute expanded HIV clinical tasks. Policymakers and managers of healthcare services must therefore devise strategies to mitigate the numerous identified barriers to nurses gaining the necessary authority and autonomy to execute expanded HIV clinical tasks. These strategies could include developing supportive legislation, updating nurses' job descriptions to include their expanded roles and responsibilities in HIV care, and clarifying nurses' roles to healthcare facility staff and managers. On top of factors within the healthcare facility

environment, the current study has revealed that factors within the personal nurse environment influence the development and implementation of effective nurse-led ART clinics. These factors are discussed in the next section.

9.6 Personal Nurse Environment

The current study found that factors internal to the nurse, which include nurses' altruism, age, experience in HIV care, education level, and gender influence the development and implementation of effective nurse-led ART clinics.

Similar to other studies in SSA (Georgeu, Colvin et al. 2012, Davies, Homfray et al. 2013, Iwu and Holzemer 2014, Spies, Gray et al. 2016), the current study has revealed that in the absence of health system supports and incentives, nurses' desire to do good and their belief that providing HIV clinical services makes a significant positive difference to their patients is a strong motivator for nurses to execute expanded HIV clinical roles. Like in the current study, Spies, Gray et al. (2016) found that even in the face of severe resource constraints, Ugandan nurses were motivated to expend energy to provide HIV services as they saw their patients getting better, further underscoring the importance of professional ethos and emotional reward in improving nurses' motivation and morale to provide HIV clinical services. The importance of altruism in motivating nurses to execute expanded clinical roles appears to be universal as evidenced by the findings of studies in industrialised countries (Collins, Jones et al. 2000, Tye and Ross 2000, Rafferty, Ball et al. 2001, Kinley, Czoski-Murray et al. 2002, Marsden, Dolan et al. 2003, Easton, Griffin et al. 2004, Norris and Melby 2006, Zangaro and Soeken 2007, McKenna, Richey et al. 2008, McElhinney 2010).

However, while nurses' altruism may increase their intrinsic motivation to execute expanded HIV clinical roles, it might have limitations with demanding work such as providing HIV care services. Indeed, Kironde and Klaasen (2002) observed that altruism could not sustain the motivation of community healthcare workers to provide demanding services such as community-based TB care in South Africa without incentives. Despite this concern, given the severe resource constraints experienced by the Uganda health system, reinforcing nurses' reasons for becoming healthcare workers in the first place

and reinforcing their attachment to their profession could be one of the few available motivation strategies for nurses in expanded HIV clinical roles. Without this reinforcement, attracting nurses in expanded HIV clinical work and motivating them to perform expanded HIV clinical tasks will be a daunting task for the GoU. Moreover, ignoring the numerous external factors that prevent nurses from meeting their professional goals will curtail their ability to offer HIV services and demotivate them further.

Similar to the findings of McElhinney (2010) in a study on factors which influence nurse practitioners' ability to carry out physical examination skills in the clinical area in the UK, participants in the current study, including patients, believed that nurses with more years of work experience in HIV care were more competent than those with less experience. Indeed, nurses with more work experience in HIV care scored higher in the HIV clinical vignette tests than those with less experience, affirming that experience improves nurses' competencies in managing HIV-related disease conditions. Important also is the finding of this study that more experienced nurses were more acceptable to patients and other stakeholders as providers of expanded clinical services as they were believed to have gained the required competencies over time, a finding also supported by McElhinney (2010).

Another insightful finding of the current study is that patients and doctors used nurses' education level as a criterion to determine nurses' competencies and to gain confidence in nurses' ability to deliver expanded HIV clinical services. The patients, in particular, felt that a diploma in nursing was the minimum qualification required to enable nurses to run nurse-led ART clinics competently. Jacobi (2010), in Ethiopia, also found that patients used the pre-service background and education level to gauge the ability of lower cadre healthcare workers to perform expanded clinical tasks. Similarly, Niezen and Mathijssen (2014) in a systematic review on task shifting in the Netherlands, found that nurses' education was a key determinant of what task reallocation from the medicine to the nursing domain was permissible.

The current study has also revealed that patients, especially females with health conditions considered intimate in nature, prefer nurses as their healthcare providers simply because most nurses are females like them, as opposed to doctors who are mostly males. The importance of gender matching has been noted by other studies which have found that women prefer female providers in specific clinical situations such as genital or anal examinations, considered intimate (Fennema, Meyer et al. 1990, Watson and Mahowald 1999). Patients in the current study also used nurses' age to gauge their competencies, believing that older nurses were more competent since they had gained the necessary experience to handle independently ART prescription and complications that could arise, to understand the patients' concerns, and to keep their information confidential. Delbanco and Gerteis (2010), in Ghana, found that young nurses working in traditional societies did not easily gain the respect of elderly community members, who considered them inexperienced and thus not competent. Philips, Zachariah et al. (2008) and Buchan and O'May (2000) have also warned that policymakers should be cognisant of societal preferences regarding age during task shifting which could influence the acceptability of healthcare workers to communities.

From the findings of this study, it is apparent that policymakers and managers of healthcare services need to consider nurses' altruism, age, experience in HIV care, educational level, and gender, among the criteria for choosing nurses to run nurse-led ART clinics. These characteristics are especially important to ensure that nurses have the required competencies and motivation to execute expanded HIV clinical tasks competently and are more acceptable to patients and other stakeholders.

The current study has also revealed that nurses' competence, self-confidence, and motivation are nurse-level outcomes through which factors within the community and patient, policy and funding, wider health system, healthcare facility and personal nurse environments influence the development and implementation of effective nurse-led ART clinics. How each of these nurse-level outcomes influences the development and implementation of effective nurse-led ART clinics is discussed in the next section, starting with nurses' competence.

9.7 Nurse-Level Outcomes

All the participant groups in the current study underscored the importance of nurses having the necessary competencies if they are to execute expanded HIV clinical tasks according to national standards. However, varied definitions of a competent ART provider emerged from the different groups. For the nurses and doctors in the current study, a competent ART provider was one with good levels of HIV knowledge, excellent skills in HIV care, relevant HIV experience, as well as with the ability to use this knowledge and skills properly to the benefit of their patients. These healthcare professionals' definition is similar in many ways to standard definitions of a competent healthcare provider. For example, Kak, Burkhalter et al. (2001) defined a competent healthcare provider as one with the ability to perform specific tasks in a manner that yields desirable outcomes, while Lane and Ross (1998) defined a competent healthcare provider as one with the ability to successfully apply knowledge, skills, and abilities to new situations as well as to familiar tasks for which prescribed standards exist.

Contrary to the healthcare professionals' definition of a competent ART provider, which used only technical skills of healthcare workers, most patients described a competent ART provider using mainly interpersonal skills and socio-demographic characteristics. A few patients, however, also defined a competent ART provider as one who can ask appropriate questions about the patients' HIV disease condition, examine patients well and in an orderly manner, order for appropriate laboratory investigations, prescribe appropriate medicines, and monitor treatment outcomes. Like with the healthcare professionals, these patients were aware of the elements of technical competence and practically used them as important criteria to gauge ART providers' competence. The patients' definition is in line with that of patients in other studies. For example, patients in a rural hospital in Indiana in the USA defined a competent nurse using mainly social attributes such as how well the nurse had communicated with them during education sessions, with only a few of them also using technical skills as a measure of a skilled nurse (Wysong and Driver 2009).

The fact that healthcare professionals in the current study included in their definition of a competent ART provider the ability to use knowledge and skills appropriately for the

benefit of patients, signifies the importance they attach to clinical reasoning skills as a precondition for nurses to competently perform expanded HIV clinical tasks. Indeed, numerous authors have defined competent healthcare workers as those who have clinical reasoning skills, the ability to collect important patient-related cues, and the ability to process the information to understand patients' problems before deciding on which interventions to use (Krairiksh and Anthony 2001, Lauri, Salantera et al. 2001, Lord 2003, Hoffman, Duffield et al. 2004, Hoffman 2007, Higgs, Jones et al. 2008). Identical to what the nurses and doctors in the current study noted, Higgs, Jones et al. (2008) observed that clinical reasoning is the foundation of professional clinical practice, and in its absence, clinical practice becomes impossible as effective patient-related decisions cannot be made autonomously. Clinical reasoning skills have also been found to enhance professional autonomy, authority, competence, and motivation (Higgs, Jones et al. 2008), which were also believed by participants of the current study to be key prerequisites that enable nurses to execute expanded HIV clinical tasks effectively.

The current study has also revealed that HIV-related tasks such as education and counselling, which nurses perceived they were competent at delivering, are the same tasks that doctors and patients perceived nurses to be competent at performing and they are the domains of HIV clinical care in which nurses performed well in the HIV clinical vignette tests. This finding is not surprising since other studies on task shifting in SSA have also found that patients prefer nurses because they consider them better than doctors at explaining complex medical information in a way that makes it easy for patients to understand and better at offering patient education and counselling services (Schneider, Hlophe et al. 2008, Mwai, Mburu et al. 2013, Rashidian, Shakibazadeh et al. 2013).

Likewise, this study found concurrence between patients and nurses about the tasks they perceived as complicated and felt that nurses did not have the required competencies to perform. Indeed, it is at the same tasks that nurses performed poorly in the HIV clinical vignette domains. Such tasks included interpreting laboratory results, diagnosing illnesses, managing severe drug side-effects, managing concurrent tuberculosis or meningitis and HIV, and switching from first-line to second-line ART in clients who develop complications. Enhancing nurses' competencies at performing those tasks will

need to be emphasised during the capacity building of nurses selected to run nurse-led ART clinics.

Another critical finding of the current study is that although doctors on the whole performed better than nurses across the eight HIV clinical vignettes representing HIV-related disease conditions, the difference was more pronounced in the four complex conditions in comparison to the four simple ones. This finding underscores the need for policymakers and managers of health services to develop clear guidelines for the kind of HIV-related disease conditions that nurses in expanded HIV clinical roles will manage. It also underscores the need to build the competencies and self-confidence of nurses to recognise and refer complex disease conditions for appropriate care.

Similar to the findings of this study, other researchers have demonstrated a positive effect of healthcare workers' competencies on their ability to execute given tasks according to standards (Hunter 1983, Spencer, McClelland et al. 1994, Hagbaghery, Salsali et al. 2004). Having the knowledge and skills to undertake a role positively influences autonomy, confidence, and job satisfaction of nurses in expanded roles (Gibson and Bamford 2001, Read 2001, Roberts-Davis and Read 2001, Marsden, Dolan et al. 2003, McElhinney 2010), identified by the current study as some of the prerequisites for nurses to be able to execute expanded HIV clinical tasks.

In concurrence with studies on nurse-based task shifting in industrialised countries (Bamford and Gibson 2000, Tye and Ross 2000, Read 2001, Scholes and Vaughan 2002, McElhinney 2010, Jones, Edwards et al. 2011), the current study strongly suggests that nurses' competence is an outcome at nurse-level developed through pre-service training, continuing education, in-service training, on-the-job experience, support supervision, mentorship, and feedback on performance from supervisors, doctors and colleagues. However, as already discussed throughout this chapter, numerous challenges exist with the capacity-building mechanisms that will need the attention of policymakers. To improve nurses' performance at executing expanded HIV clinical tasks, policymakers will need to redesign nurses' education both at the pre- and in-service levels to enhance nurses' competencies particularly in the HIV clinical domains of care that involve

clinical reasoning and in which nurses performed poorly in the vignettes, making a diagnosis and coming up with a complete treatment plan. In addition, because patients and healthcare professionals define a competent ART provider differently, there is a critical need for policymakers and managers of health services to take into consideration these varied perspectives when developing the competencies of nurses selected to run nurse-led ART clinics. It is important to develop both interpersonal and technical competencies of nurses if they are to be more effective and acceptable to patients and other stakeholders as providers of ART. Moreover, managers of healthcare facilities will need to take into consideration these varied characteristics while choosing nurses to run nurse-led ART clinics. In addition to competencies, this study has highlighted the critical role played by self-confidence in influencing nurses' ability to execute expanded HIV clinical tasks and is discussed next.

The current study found that nurses who had developed the required competencies after training did not always perform expanded HIV clinical tasks as expected due to self-doubt in their capabilities, pointing to the critical role self-confidence plays in empowering nurses to execute expanded HIV clinical tasks. To the participants in this study, self-confidence is self-belief in one's capabilities to perform a given task, a definition akin to that of Bandura (1977) who defines self-confidence as one's judgment about his or her capabilities to accomplish some goal. Like participants in this study believed, there is strong evidence in the literature that nurses who display self-confidence are more motivated to act autonomously and to make independent decisions for their patients when compared to the less-confident ones (Richmond and Becker 2005, Green, Westwood et al. 2009, Georgeu, Colvin et al. 2012, Blanchflower, Greene et al. 2013). As in the current study, other researchers have found that less-confident nurses refer patients they could have otherwise managed to doctors (Tye and Ross 2000, Mavis 2001, Brown, O'Mara et al. 2003, Crooks, Carpio et al. 2005, Farrand, McMullan et al. 2006, Fletcher, Baker et al. 2007, Offredy, Kendall et al. 2008, Zwijnenberg and Bours 2012, Iwu and Holzemer 2014, Niezen and Mathijssen 2014). The inability of nurses to provide care to patients due to lack of self-confidence defeats the purpose of nurse-led ART clinics since these patients could have been managed by those nurses' if they had the necessary confidence to do so. Indeed, Southgate and Dauphinee (1998) found that healthcare workers' competence did not always predict their performance at executing tasks according to standards as it was also determined by their self-confidence.

However, despite the importance of self-confidence in enabling nurses to execute expanded HIV clinical tasks, this study found that the majority of nurses in Uganda lack self-confidence. Like Adib, Salsali et al. (2004) found among Iranian nurses, the current study revealed that the lack of self-confidence among nurses in Uganda is a direct result of the inappropriate education system that emphasises theory at the expense of practical sessions. Nurses' lack of self-confidence was also found to result from the negative sentiments displayed by the community and healthcare workers, particularly doctors, who consider nurses as neither adequately trained nor intelligent enough to manage HIV-related illnesses on their own. Baker (2001), in an Australian study, as well found negative community attitudes, poor collegial relationship, and poor staff interactions with their managers as key factors that reduce nurses' self-confidence to take on complex tasks.

In contrast, overconfident nurses who take on tasks for which they do not have requisite competencies thereby causing harm to their patients, were also revealed by this study to be a major barrier to the proper functioning of nurse-led ART clinics as patients and the community may shun them.

However, a rather confusing finding of this study is that the same nurse-participants who said that most of their colleagues lacked self-confidence went ahead to profess that they themselves were confident at performing numerous ART-related tasks proposed for nurses in nurse-led ART clinics. These nurse-participants claimed that they were confident at performing tasks ranging from patient preparation to initiation of first-line ARV regimen for ART-naïve patients. The finding that nurse-participants in this study felt confident at performing various ART-related tasks is a facilitator to the proper functioning of nurse-led ART clinics since self-confidence is a major motivator for nurses to execute expanded HIV clinical tasks. Policymakers and managers of health services could seize this opportunity of nurses' positive self-belief in their capabilities by building their competencies, boosting their motivation, granting them the necessary authority and autonomy, and providing them with health system supports to enable them to execute expanded HIV clinical tasks effectively. Policymakers need to address the

inadequacy of nurses' education system and the negative sentiments from the community and doctors that have eroded nurses' self-confidence over the time as inattention to them could critically limit the proper functioning of nurse-led ART clinics, as nurses will feel less confident to execute expanded HIV clinical tasks. Besides competence and self-confidence, motivation was found by this study to be critical in enabling nurses to execute expanded HIV clinical tasks and is discussed next.

The finding of this study that some of the nurses who had the required competencies and self-confidence did not always execute expanded HIV clinical tasks due to a lack of incentives to do so brings to light the importance of motivation. This revelation affirms Bandura's assertion that competence and self-confidence are major determinants of performance only when the concerned individuals have sufficient motivation to act (Bandura 1977). Likewise, Georgeu, Colvin et al. (2012) and Stein, Lewin et al. (2008) in South Africa found that motivation is critical in enabling nurses to execute expanded HIV clinical tasks. However, as discussed throughout this chapter, this study found that nurses' motivation is influenced by numerous factors within the patient and community, policy and funding, wider health system, healthcare facility, and personal nurse environment, as well as by nurses' competence and self-confidence. Examples of such factors include negative community and patient attitudes towards nurses in expanded HIV clinical roles, unsupportive legislation, non-commensurate remuneration, high workloads, lack of support from managers and other healthcare team members, lack of medicines, tools and equipment, and lack of supportive supervision and opportunities for professional and career development.

However, this study also found that nurses' motivation affects only those aspects of performance under the nurse's personal control. For example, when healthcare facilities failed to provide nurses with essential equipment, medicines, and supplies, even the most motivated nurses could not accomplish their tasks. This finding further affirms that nurses' ability to deliver expanded HIV clinical services is not just a matter of how motivated they are for the tasks, but also depends on whether they possess the necessary competencies, self-confidence, authority, autonomy, and have the required systems and human resource support to do their work. Similarly, Kanfer (1999) asserted that although the motivation of workers is critical in ensuring good performance, workers' ability to

perform is not explicitly determined by only motivation, but is also dependent on numerous contextual determinants of performance. The interaction amongst competence, self-confidence, and motivation to influence nurses' ability to execute expanded HIV clinical tasks is discussed next.

Evident from the results of the current study is that nurses who felt competent at executing expanded HIV clinical tasks were more likely to be confident and motivated to do so. This study revealed that as nurses achieved positive outcomes for their patients, they became more motivated and self-confident, which in turn encouraged them to quest for more knowledge to become more competent to do more for their patients. Further, this study revealed that with improved competence, nurses became more self-confident and motivated to achieve even more. Considering this relationship amongst nurses' competence, self-confidence, and motivation, one could argue that if nurses fail to achieve positive results for their patients for any reason, they may experience a dip in their self-confidence levels, which may in turn negatively affect their motivation to try again. Internationally, researchers have also observed this relationship, mentioning that if nurses have requisite competencies to undertake a role, their confidence and motivation increases (Gibson and Bamford 2001, Read, Jones et al. 2001, Marsden, Dolan et al. 2003). Indeed, Bandura (1977) noted that workers' competencies directly affect their self-confidence to perform given tasks, which in turn affects their motivation.

Clearly understanding and acting on the relationship amongst nurses' competence, self-confidence, and motivation is important for policymakers and managers of health services if they are to improve the nurses' ability to execute expanded HIV clinical tasks effectively. This relationship is especially important, as this study has clearly identified nurses' competence, self-confidence, and motivation as some of the prerequisites through which numerous factors within external and the individual nurse environments influence the effectiveness of nurse-led ART clinics. Other prerequisites for the development and implementation of effective nurse-led ART clinics identified by this study include nurses' autonomy and authority, the presence of system and human resource support, and the acceptability of nurses as providers of ART by patients and other stakeholders. These prerequisites might explain how factors within the patient and

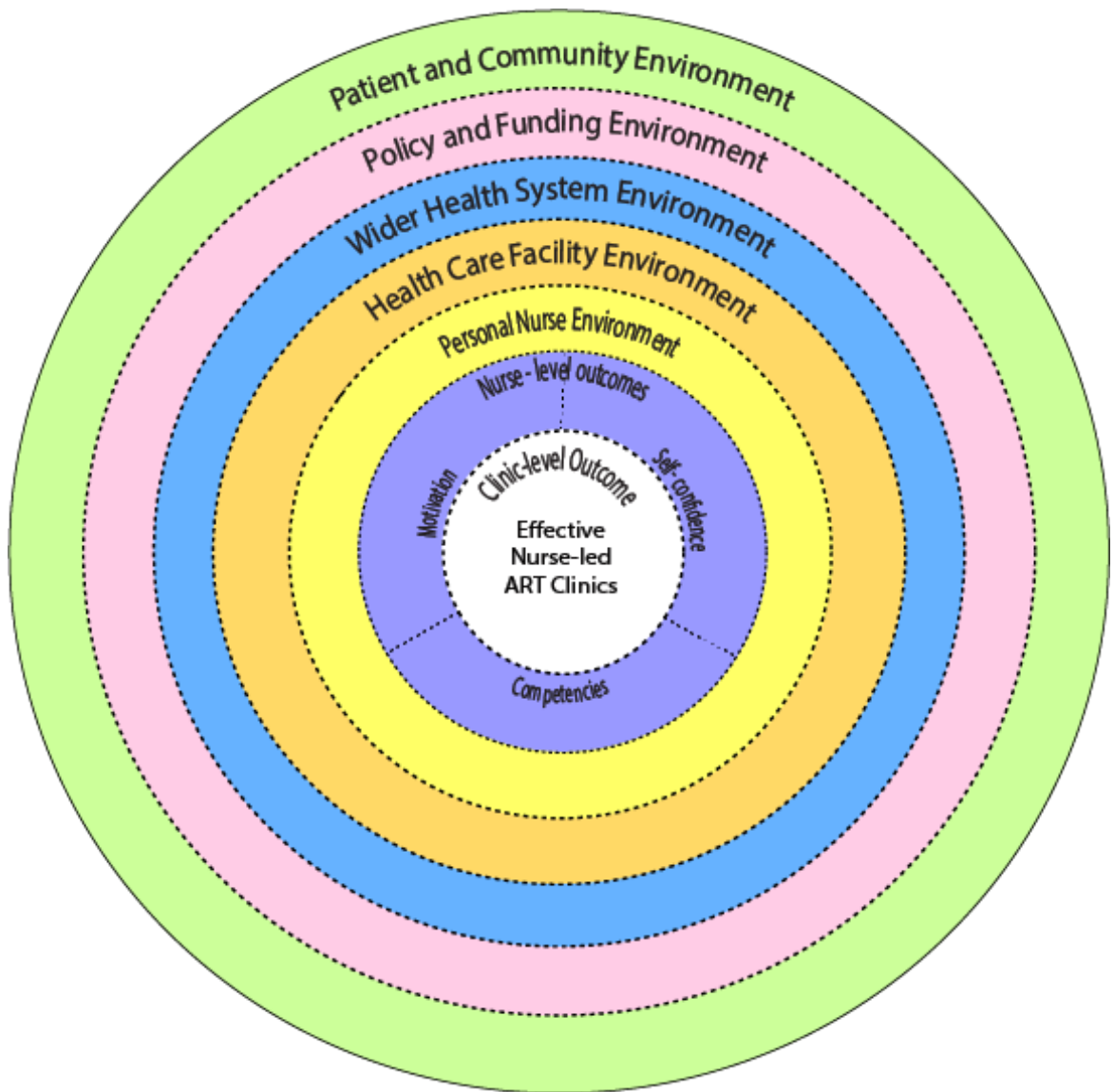
community, policy and funding, wider health system, healthcare facility, and personal nurse environments influence the effectiveness of nurse-led ART clinics.

It is also apparent from the results of this study that nurses' competence, self-confidence, and motivation are not attributes of the individual nurse or of the external environment, but rather nurse-level outcomes that result from interactions between nurses in expanded HIV clinical roles and their external environment. How the different factors act to influence the development and implementation of effective nurse-led ART clinics is depicted in the modified conceptual framework that evolved from the preliminary one. The new framework is presented in the next section.

9.8 Modified Conceptual Framework of Factors Influencing the Development and Implementation of Effective Nurse-Led ART Clinics

Drawing on the results of the current study, I constructed a modified conceptual framework of factors influencing the development and implementation of effective nurse-led ART clinics (Figure 9.1). This modified framework, which addresses Objective 4 of this study, divides factors that influence the development and implementation of effective nurse-led ART clinics into five layers. As depicted in the modified conceptual framework, I differentiated performance outcomes of nurse-led ART clinics at two levels: nurse-level outcomes (competence, self-confidence, and motivation) and clinic-level outcome (effective nurse-led ART clinic). This framework is described further in this section.

Figure 9-1: The Modified Conceptual Framework of Factors Influencing the Development and Implementation of Effective Nurse-led ART Clinics



Legend

<p>Patient and Community Environment</p> <ul style="list-style-type: none"> • Demand for HIV Services amidst the Shortage of Doctors • Community and Patients’ Attitudes towards Nurse-led ART Clinics • Community and Patients’ Perceived Benefits of Nurse-led ART Clinics • Community and Patients’ Perceived Complexity of Illness 	<p>Policy and Funding Environment</p> <ul style="list-style-type: none"> • Legislation and Regulations • Funding and Cost Implications of Nurse-led ART Clinics
<p>Wider Health System Environment</p> <ul style="list-style-type: none"> • Job Descriptions • Participatory Planning and Stakeholder Involvement • Nurses’ Education and Curriculum • HIV In-service Training Course • Mentorship, Support Supervision, and Feedback on Performance • Compensation of Nurses who take up Expanded HIV Clinical Roles • Effect on Nursing Roles and Profession Aims • Effect on other Health Service Areas 	<p>Healthcare Facility Environment</p> <ul style="list-style-type: none"> • Clarity of Nurses’ Roles and Responsibilities in HIV Care • Manager’s Support • Doctor’s Support • Teamwork • Clinical Guidelines and Protocols • Tools, Supplies, and Working Space • Referral System • Staffing Levels and Workload • Authority and Autonomy
<p>Personal Nurse Environment</p> <ul style="list-style-type: none"> • Experience in HIV Care • Education • Age • Gender • Altruism 	<p>Nurse-level Outcomes</p> <ul style="list-style-type: none"> • Competencies • Self-confidence • Motivation
<p>Clinic-level Outcome</p> <ul style="list-style-type: none"> • An effective nurse-led ART clinic 	

I developed the modified conceptual framework using the Russian “Matryoshka” design paradigm, which denotes a recognisable relationship of "object-within-similar-object" appearing in the design of many natural and crafted objects (Herod, Rainnie et al. 2007). This design paradigm also commonly known as the nested doll principle is used to portray how factors within the layers of modified conceptual framework (representing the different environments) act and interact to influence the nurse- and clinic-level outcomes. Although it is apparent that factors within the different layers of the framework are interrelated, they are discussed separately to improve clarity. However, during the discussion, the interrelationships that exist amongst the various factors as revealed by this study are only brought in for illustrative purposes. The dotted lines between the layers represent these reciprocal relationships.

Analogous to the Matryoshka metaphor, in the modified conceptual framework, the personal nurse environment is the smallest innermost layer that encompasses both the nurse- and the clinic-level outcomes, and from which other layers can only fit together in a strict progression to the largest outermost layer, the patient and community environment, thereby presenting a nested hierarchy. Factors within the more distal layers from the centre have a far-reaching influence on nurse- and the clinic-level outcomes through their interactions with those within and between the different layers of the modified framework. In other words, factors within the outer layers expand (act as facilitators) or constrain (act as barriers) around those within the inner layers to influence nurse- and the clinic-level outcomes.

In the modified framework, the outermost layer (patient and community environment) presents the main context, the landscape, and the desires of the people about how HIV services should be delivered and by whom. All the other inner layers can then be unpacked from this context and then further unpacked until the clinic-level outcome is reached at the centre. The demand for HIV services amidst the scarcity of doctors to provide them, the community and patients' attitudes towards nurses as providers of ART, their perceived benefits of nurse-led ART clinics, and their perceived complexity of illnesses are the factors within the patient and community layer that influence nurse- and the clinic-level outcomes. These factors have the strongest external influence on the nurse- and clinic-level outcomes because they include the demand for HIV services in the absence of doctors to provide them, which is the driving force for the introduction of nurse-led ART clinics in the first place. This service gap can influence numerous factors within the patient and community layer and in the inner layers of the framework. For example, this service gap can compel policymakers to enact laws and regulations to allow nurses to take up expanded HIV clinical roles to fill that void. It can also compel policymakers to source for funds to pay for nurse-led ART-related costs. Further, out of necessity, this service gap can force patients and the community to accept nurse-led ART clinics, since they perceive them to be beneficial as they fill a gap.

Depicted in the modified framework also is the legislation and funding environment layer comprised of policy and regulation, and funding and cost implication of nurse-led ART clinics as the factors that influence nurse- and clinic-level outcomes. Similar to the patient and community layer, nurses in expanded HIV clinical roles are physically far away from the policy and funding layer, and are unlikely to influence the factors within it directly, yet these nurses continue to experience the effects resulting from the interactions of the factors within this layer with those in the inner layers closest to them. In other words, factors within the policy and funding layer can create facilitators or barriers for nurses to execute expanded HIV clinical tasks through their influence on factors in the inner layers. For example, with restrictive legislation and lack of funding, many nurses are not likely to execute expanded HIV clinical tasks as they might experience numerous barriers including lack of authority, autonomy, fair salaries, tools, equipment, and referral systems, among other factors within the inner layers. With permissive legislation and adequate funding, the opposite is likely to happen.

Furthermore, the modified framework shows stakeholder involvement, nurses' job description, nurses' pre-service training, and the HIV in-service training course as factors within the wider health system environment layer that influence nurse- and clinic-level outcomes. Mentorship, support supervision, feedback on performance, and compensation of nurses who take up expanded HIV clinical roles are some of the other factors within this layer. The effect of nurses' expanded HIV clinical roles on other health service areas, and on traditional nursing roles and professional aims are also factors within the wider health system layer that influence nurse- and the clinic-level outcomes. Similar to other factors within the outer layers, factors within the wider health system layer significantly influence nurse- and clinic-level outcomes, even though they are also still far away from nurses in expanded HIV clinical roles.

However, as portrayed in the framework, the wider health system layer moves beyond the "personal nurse-healthcare facility environments" dyad relationship, by connecting the factors within the healthcare facility layer (where nurses in expanded HIV clinical roles are situated) to those within the policy and funding layer which in turn connects them to the patient and community layer. An example of these inter-linkages is the observation that while nurses' job descriptions (a wider health system environment

factor) form the basis for clarifying nurses' work in HIV care (a healthcare facility environment factor), permissive legislation (a policy and funding environment factor) is the driving force for making necessary changes to nurses' job descriptions to include their expanded roles in HIV care. These connections and interactions can be expanded further to the patient and community layer presenting the demand for HIV services amidst a scarcity of doctors that can compel policymakers to enact legislation to allow nurses to provide expanded HIV clinical services, which in turn can drive the required changes to nurses' job descriptions, as has already been discussed.

Besides the wider health system, the healthcare facility layer within the modified framework is the closest layer to nurses in expanded HIV clinical roles, and thus contains factors with which they have direct contact. In this layer, how nurses' roles and responsibilities in HIV care are articulately communicated, the level of managers' and doctors' support available to nurses, how much the culture of teamwork exists or is promoted, and the presence of HIV clinical guidelines and protocols, are some of the prominent factors that influence nurses' ability to execute expanded HIV clinical tasks. Other important determinants of nurses' performance within the healthcare facility layer include the availability of equipment, supplies, working space, and a functional patient referral system as well as issues related to staffing and workload levels. Because this layer is the core venue for nurses during work, factors within it have a direct impact and present significant facilitators or barriers to their ability to execute expanded HIV clinical tasks. As nurses' most intimate work settings, the real power of the factors within the healthcare facility layer lies in granting nurses the autonomy and authority, and providing them with the material, human resources, and emotional support needed to execute expanded HIV clinical tasks. For instance, managers', doctors' and other healthcare team members' support can affect nurses' ability to execute expanded HIV clinical tasks directly because of their influence on nurses' authority and autonomy, or indirectly through their effect on the factors within the nurse-level outcome layer, nurses' competence, self-confidence, and motivation.

Shown in the modified conceptual framework also is the nurse personal environment layer. This layer is comprised of nurses' age, gender, years of work experience in HIV care, and altruism - factors that influence nurse- and clinic-level outcomes. The finding

of the current study that as providers of ART, nurses with more years of work experience in HIV are more acceptable to patients and other stakeholders than their less experienced counterparts is an example of a direct influence on the clinic-level outcome. Also, the findings that nurses are more acceptable to female patients with health problems they considered intimate, simply because they are female like them, is another example of a factor in the personal nurse environment layer directly affecting the clinic-level outcome. On the contrary, the finding of the current study that altruism (a factor in the personal nurse environment layer) influences the clinic-level outcome through its effect on nurses' motivation (a factor in the nurse-level outcome layer) is an example of an indirect influence. Furthermore, the finding that nurses with more years of work experience in HIV care are more competent at executing expanded HIV clinical tasks than their counterparts with less experience is another example of a factor in the nurse personal layer influencing the clinic-level outcome through its effect on competence, a factor in the nurse-level outcome layer.

Displayed in the modified conceptual framework also, is the nurse-level outcome layer, which is closest to the clinic-level outcome. This layer presents nurses' competence, self-confidence, and motivation, which are critical pathways through which numerous factors within the outer layers of the framework influence the clinic-level outcome. Nurses in expanded HIV clinical roles are not merely passive players in determining the clinic-level outcome as they were found by the current study to play a pivotal role in it. For instance, for nurses to be able to execute expanded HIV clinical tasks according to national standards and to be acceptable to patients and other stakeholders, they should have excellent interpersonal and technical competencies, motivation, and self-confidence. Interpersonal skills enable these nurses to communicate well with other healthcare team members affected by their expanded roles and responsibilities in HIV care, thus helping the team to recognise synergy rather than rivalry amongst them. These skills also enable nurses to communicate to their patients and the community members clearly, thus improving their acceptability as providers of ART. Technical competencies ensure that nurses execute expanded HIV clinical tasks according to national standards. Self-confidence in their abilities ensures that these nurses are interested in initiating and persistent at performing expanded HIV clinical tasks. Motivation ensures that they apply personal effort to execute those tasks. Consequently, if nurses lack competencies, motivation, and self-confidence, the development and implementation of effective nurse-

led ART clinics is less likely to happen. It is also worth remembering that nurses' competencies, self-confidence, and motivation interact closely as discussed in Section 9.7. These relationships are symbolised in the framework by the dotted lines between them. The interaction of factors within and between the different layers of the modified conceptual framework to influence nurse- and clinic-level outcomes is further discussed below.

As already discussed in this section, much as the factors in the inner layers exert a more direct effect on the effectiveness of nurse-led ART clinics, factors in the more distal layers have an effect too, either directly or indirectly through their interactions with those in the inner layers. For instance, even when factors within the healthcare facility layer are favourable, such as the presence of support from managers, doctors, and other healthcare team members to nurses in expanded HIV clinical roles, factors within the outer layers might cause major problems. Negative attitudes towards nurses as providers of ART by the community and patients (a factor within the patient and community layer) is a good example of such factors in the most outer layer which may directly complicate the success of nurse-led ART clinics. Similarly, the lack of supportive legislation for nurse-led ART clinics is another example of a factor in the second-most outer layer (the policy and funding layer) which can directly or indirectly complicate the actual ability of nurses to execute expanded HIV clinical tasks. This lack of supportive legislation limits nurses' authority and autonomy to prescribe medication even when other factors within the healthcare facility layer are favourable. Equally, the lack of funds, a factor within the policy and funding layer, can indirectly affect the smooth running of these clinics negatively as there is no money to pay for nurse-led ART-related costs such as salaries, training, referrals, supervision, and infrastructure adjustments among other system supports.

However, even when factors within the outer layers such as those in the policy and funding layer are favourable, factors in the inner layers can prevent nurses from executing expanded HIV clinical tasks. For example, the presence of a permissive legislation to grant nurses the authority to prescribe medication, may not necessarily result into nurses executing expanded HIV clinical tasks since their actual implementation can still be complicated by factors in the healthcare facility layer, such as

when doctors and managers are unwilling to support nurses to execute expanded HIV clinical tasks.

In addition, it is worth noting that a single factor within the outer layers of the modified framework might affect numerous factors within the different inner layers, and have multiple and therefore significant effects on the success of nurse-led ART clinics. For example, the lack of permissive legislation, results in nurses' job descriptions not being re-designed to include the HIV clinical roles and responsibilities they are actually engaged in, which leads to role ambiguity, role overlap, conflict, reduced authority, limited autonomy, and demotivation for nurses, among others. Likewise, the high demand for health services by the community results in high workloads for nurses, which may not only deny nurses the time and opportunity to engage in the delivery of expanded HIV clinical services. The resultant high workloads for nurses may also lead to their unacceptability as providers of ART by patients, as it prevents nurses from forming meaningful therapeutic relationships with their patients. These high workloads in HIV clinics may also demotivate nurses from working in these clinics.

Furthermore, although this study has revealed that most of the factors were inadequate or absent and thus presented barriers to nurses' ability to execute expanded HIV clinical tasks, one could reasonably argue that the same factors, if adequate or present, could be facilitators. For example, whereas inadequate staffing levels and a lack of doctors' support present barriers to the development and implementation of effective nurse-led ART clinics, adequate staffing levels to prevent excessive workload and the presence of doctors' support for permission to nurses to take on expanded HIV clinical roles and for consultation on complicated disease conditions, could be facilitators. It is also reasonable to assume that a permissive legislation may have multiple positive effects. It is also apparent that the interactions of factors within and between the different layers of the modified framework in themselves are strong determinants of nurse- and clinic-level outcomes. In the next section, I discuss differences between the modified and preliminary conceptual frameworks.

9.9 Differences between the Preliminary and Modified Conceptual Frameworks

Although the preliminary and modified conceptual frameworks have apparent similarities, they have significant differences too, particularly in the way they depict the interactions amongst the factors within the different environments to influence nurse- and the clinic-level outcomes. Unlike the preliminary framework, which is linear, the modified framework, which is concentric, provides insight into how numerous factors acting as facilitators or barriers influence the process of developing and implementing effective nurse-led ART clinics, thereby offering a possible approach to their introduction. The modified conceptual framework indicates the dynamic interplay between various factors within and between the different layers to influence the development and implementation of effective nurse-led ART clinics. Unlike the preliminary conceptual framework, the modified one clearly demonstrates that factors in the outer layers, particularly those within the patient and community and those within the policy and funding layers have the most significant influence on the effectiveness of nurse-led ART clinics. Understanding the dynamics of how factors in the different layers, particularly those in the outer layers of the modified conceptual framework, act as facilitators or barriers to the introduction of nurse-led ART clinics provides policymakers, managers of healthcare services, and practitioners with hands-on information about which determinants to address to ensure the success of nurse-led ART clinics. Although the modified framework suggests that the introduction of nurse-led ART clinics requires considering barriers and facilitators in all the layers depicted in the framework, it clearly highlights the importance of prioritising those in the outer layers as they also affect those in the inner layers. By implication, unlike with the preliminary framework, the modified framework has given me confidence that the successful introduction of nurse-led ART clinics must start by addressing the identified facilitators and barriers in the outer layers while simultaneously looking out for and addressing those in the inner layers as well as the interactions within and without the different layers. This observation is particularly important since the modified conceptual framework clearly shows that factors within its outer layers have the most significant impact and an across-the-board influence on the development and implementation of effective nurse-led ART clinics.

Finally, the modified conceptual framework, unlike the preliminary one, has integrated the findings of the current study in such a way that the results might apply to other comparable situations. Therefore, I trust that the modified conceptual framework is better suited for research and may even guide the development of nurse-led clinics in other service areas than the preliminary conceptual framework. In this way, insights received from the modified conceptual framework might be extrapolated and used in task shifting initiatives involving other healthcare professionals and other programme areas. For example, it might be applied in task shifting between doctors and clinical officers, and between nurses and nursing assistants, or for task shifting in other healthcare programme areas such as maternal child health. The limitations of the current study are discussed in the next section.

9.10 Limitations of the Current Study

This study, which aimed at contributing to our understanding of the factors that act as facilitators or barriers to the development and implementation of effective nurse-led ART clinics in Uganda, had limitations too, requiring a cautious generalisation of its findings to other settings.

The time and resource constraints of a doctoral study inevitably limited the possible duration and breadth of primary data collection. For instance, the fieldwork took only eighteen months, which was too short for such a magnitude of study. In addition, data was collected from only two of the eight regions of Uganda, the central and east-central regions, which may present regional bias as the different regions of the country vary with socio-economic factors such as exposure to HIV education, income, and general education levels as well as the health systems' capacity and practices.

In addition, the findings of the current study are restricted to the experiences and perceptions of the study participants with limited observations of clinical, management, and supervisory practices, among others, which may limit its implications in actual

practice. However, the range of stakeholders interviewed in the study allowed for triangulation of the findings, which could have mitigated this limitation. Moreover, the varied experiences of the different groups of participants including nurses, doctors, patients, national ART trainers, regional ART coordinators, and officials of the professional councils shed light on a broad range of potential facilitators or barriers to the development of nurse-led ART clinics, complementing and enhancing the understanding of this subject area. Thus, most of the key factors identified by the current study may have an impact on the development and implementation of effective nurse-based task shifting for HIV services in settings similar to the current study area. Even then, this study provides valuable baseline information for comparison with future research despite its inability to give completely generalisable results.

Just like any survey, a major limitation of this study is related to “courtesy or social desirability bias”, a situation in which participants might not reveal their true attitudes because of the feeling that they have to give socially or culturally appropriate answers (Cormack 1996, Abbott and Sapsford 1998). Such courtesy bias occurs when participants are reluctant to express negative opinions of services, especially while they are at the service site (León, Lundgren et al. 2007). For example, patients in this study could have felt that it was inappropriate for them to state that they were opposed to nurses as providers of ART, considering that most of them were already receiving varied HIV services from them. Some other biases could have arisen, though, from the question format, wording, and order (Bowling 2002), and from questionnaire fatigue especially since healthcare professionals are prone to it and may respond to long questionnaires with random answers or non-responses (Parahoo 1997). In this particular study, I mitigated the effects of these biases in numerous ways, including making the participants feel relaxed and assuring them of their privacy and confidentiality, as well as using different data collection methods such as FGDs, SSIs, and survey interviews with patients to triangulate the findings, thus producing stronger confirmation of the results (Torn and McNichol 1998, Tye and Ross 2000).

Furthermore, potential limitations in this study could have arisen from the type of patients interviewed. The observations from this study might be problematic since they only elicited the views of HIV-positive patients who are already in HIV care and on

ART, which might not apply to HIV-positive patients not yet in care or those already in care but not yet on ART. Given more time and resources, it would have been more meaningful to elicit views from those two other groups of patients and from the general community, who may have completely different views from those of HIV-positive patients on ART. Patients on ART may already have had exposure to nurses in expanded HIV clinical roles, which could influence their perceptions of nurse-led ART clinics.

Another critical omission is that this study did not elicit the views of international donors. International donors are critical stakeholders as they contribute over 80 percent of the HIV funding in Uganda and therefore have an important influence on the MoH policies including that on task shifting. However, on the overall, this study attempted to elicit the views of different stakeholders in HIV care, including policymakers who might have brought out the views of international donors as well since they convene quarterly meetings with AIDS development international donors.

Problematic with this study also was the timing of the data collection, since it took place immediately after a similar study within the same community of participants. I collected the quantitative data between June 2012 and October 2013, at a time when the East, Central, and Southern Africa-Health Community (ECSA-HC) was conducting research on general task shifting in Uganda. At the time I was collecting the qualitative data (between late November 2013 and June 2014), some participants who had participated in the ECSA-HC study reminded me, mistakenly though, that they had already talked about these issues in an earlier study with my group. These participants could have felt that I was wasting their time, since some of the issues raised were similar, and this could have affected the depth of what they told me. To mitigate this, I took time to explain to them that these two studies, though related in some ways, contrasted regarding their aims and significance. As such, I urged them to be explicit about the issues that I would raise even though they could have talked about similar issues with the ECSA-HC research team.

Additionally, answering research questions related to the objectives of the current study necessitated spanning different disciplines. For instance, I used a combination of public health and social literature to frame the research questions, sociological methods to answer them, and a review of the policy environment to contextualise the findings. While the benefits of using mixed methods for this study have already been explained and are well rehearsed in the literature (Parker et al., 2000), I faced numerous dilemmas with using multiple methods, such as digressing far afield because of the different kinds of theoretical frameworks, methodologies, and research designs. Further, the paucity of resources required for multi-method studies limited the depth and breadth of this study. Thus, I faced a key challenge of finding the appropriate balance between depth and breadth, and maintaining methodological and analytical rigour while also operationalising concepts in ways that are intelligible to the participants. Nonetheless, given that the development and implementation of effective nurse-led ART clinics is driven by community, social, organisational, and system factors, it was necessary to integrate the perspectives of different disciplines to understand the dynamics for successfully designing an acceptable ART delivery model. As advised by Polit and Beck (2008), I negotiated this myriad of disciplines by developing a preliminary conceptual framework that guided me in navigating through these different fields by organising complex phenomena which identified key concepts and their relationships.

Nevertheless, despite its limitations, the current study has given insight and understanding in important ways, of the views of different stakeholders including HIV-positive patients on ART, on the proposed nurse-led ART clinics, and helped to identify potential facilitators and barriers to their effectiveness from their perspective. Based on the results of this study, I have proposed recommendations relevant to policymakers, managers of health services (at national, district and healthcare facility levels), practitioners, professional councils, educators, and researchers. These recommendations are presented in the next chapter.

10 Recommendations for Policy, Practice, Education, and Research

10.1 Introduction

The previous chapter highlighted numerous factors acting as either facilitators or barriers to the development and implementation of effective nurse-led ART clinics in Uganda. This chapter addresses Objective 5 of the current study by presenting a discussion of the key recommendations arising from the results of the study. Clearly, the present study has identified nurses' competence, self-confidence, motivation, autonomy, authority, systems and human resource support, and the acceptability of nurses as providers of ART by patients and other stakeholders as the key prerequisites for the successful development and implementation of effective nurse-led ART clinics. Factors ranging from the patient and community to the nurse personal environment affect the development and implementation of effective nurse-led ART clinics through their influence on those prerequisites. The recommendations for policymakers and managers of health services at the national level are presented in the next section.

10.2 Recommendations for Policymakers and Managers of Health Services at the National Level

Because the current study has revealed that many barriers to the development and implementation of effective nurse-led ART clinics arise mostly from the ad hoc nature in which these clinics happen, policymakers and managers of health services at the national level will have to provide leadership and plan adequately for their introduction to ensure success. The purpose of planning should be to create an environment that supports nurses to execute expanded HIV clinical tasks if their sustainability and the long-term integration within the healthcare system is to be guaranteed.

During planning, policymakers and managers at national level should identify strategies that boost the prerequisites for the development and implementation of effective nurse-led ART clinics (nurses' competence, self-confidence, motivation, autonomy, authority, systems and human resource support, and the acceptability of nurses as providers of ART by patients and other stakeholders). Mitigating the effects of the barriers and enhancing the facilitators identified by the current study to nurses in expanded HIV

clinical roles acquiring these prerequisites should, thus, be the focus of the planning. Since this study has demonstrated that factors within the patient and community, and policy and funding environments have the greatest effect on the development and implementation of effective nurse-led ART clinics, in the short term, strategies that target factors within the two environments are the ones most likely to have a positive significant impact. More specifically, during planning, policymakers and managers at the national level should give special attention to barriers such as the lack of supportive policies and regulatory frameworks, the lack of funding, the absence of stakeholder involvement, and the inadequacy of nurses' in-service training in HIV care. However, they should also give attention to other factors such as limited managers' support, the inadequate support supervision, the inefficient referral systems, and the limited human and material resource. The implementation plans for nurse-led ART clinics should take into consideration how stakeholders will be consulted about nurses' expanded roles in HIV care, how potential nurses will be equipped with the necessary competencies, and how management support and resources to enable nurses to perform expanded HIV clinical tasks will be addressed. They should also take into consideration how policies, regulatory mechanisms, and procedures that limit nurses' authority and autonomy to execute expanded HIV clinical roles will be addressed. Furthermore, these plans should include how nurses and other members of the healthcare team to work in expanded HIV clinical roles will be selected, and how nurse-led ART clinics will be initiated. However, during planning, policymakers need to recognise that it might not be possible to have all the necessary interventions in place at the time of introducing these clinics. Hence, they will need to plan for strategies that support an incremental implementation process, starting with, for example, conducting in-service HIV training for nurses.

Additionally, policymakers and managers at the national level will need to cost and budget for these plans, as well as plan for financing mechanisms for one-time and recurrent expenditures to ensure the sustainability of nurse-led ART clinics. Specifically, the plans should indicate the source of funds for training, supervision, referral systems, and adequate wages for nurses as well as for new and existing staff. Furthermore, due to the severe lack of equipment, tools, and space for nurse-led ART clinics revealed by the current study, there is a need for policymakers and national-level managers to plan for funds to purchase essential equipment and supplies, and to remodel or construct physical infrastructure. There is also a need to budget for laboratory technologies such as CD4

count and viral load measurement equipment to help nurses detect treatment failures early enough in the absence of experienced clinicians, thus improving patients' outcomes. It is also critical that policymakers and national-level managers include in the plans budgets for costs likely to arise from increased demand levels for HIV and other healthcare services created through nurse-led ART clinics. During planning, policymakers at the MoH will need to work with the donors who, as revealed by the current study, fund more than eighty percent of Uganda's HIV response, to garner their support and to secure sustainable financing for the nurse-led ART-related activities. In addition, policymakers at the MoH will need to work with officials from the ministries of finance, labour, public service, and education, to lobby for increased government funding for these clinics.

Although legislation and regulations are necessary to protect the public by providing the scope of practice, standards of education, and codes of conduct for nurses and other healthcare workers, this study found the existing legislation and regulations restrictive for nurses to execute expanded HIV clinical tasks. In the absence of a policy to allow nurses to execute expanded HIV clinical tasks, this study found that nurses lack the authority, autonomy, responsibility, and indemnity to provide HIV clinical services. Thus, policymakers will in the longer-term need to lobby the Parliament of Uganda to amend nurse practice laws and regulations to create an enabling policy environment for nurses to execute these roles. While lobbying the legislators, it is critical that policymakers work hand-in-hand with the regulators, the UNMC, to gain their approval and to establish the credentialing process for nurses in expanded HIV clinical roles. Supportive policies are not only necessary in granting nurses the required authority and autonomy to execute expanded HIV clinical tasks, but are also useful in lobbying for resources from the relevant government departments and donors. Permissive legislation and regulation for nurse-led ART clinics are also likely to make these clinics sustainable, as nurses and other healthcare workers who assume additional tasks and the patients receiving treatment will feel protected.

However, because this study found that legislation is lagging behind the current rate of expansion of nurses' HIV clinical roles, in the short term, policymakers should develop guidelines and protocols to enhance nurses' authority, autonomy, and accountability in

HIV care as well as to guide the process as they pursue these long-term legislative changes. These guidelines and protocols should outline nurses' roles and responsibilities in HIV care thus helping to avoid role ambiguity and its resultant consequences such as work overload and conflict amongst the healthcare team members, identified by the current study to cause problems. In the short-term, it is also important that health policymakers develop policy guidelines to support the in-service training of nurses in expanded HIV care and management using the IMAI course approach.

This study found that the lack of stakeholder involvement in efforts to implement new healthcare initiatives in Uganda caused resistance to their introduction. Policymakers will thus have to involve and consult with patients, nurses, doctors, professional councils, donors, and other line government ministries during the policy development process to ensure consensus and to garner their support. Specifically, given that the concept of expanded nurse HIV clinical roles is relatively new in Uganda, policymakers will need to encourage all stakeholders to be involved in determining the need for these clinics and in designing how nurses in expanded HIV clinical roles will fit into the healthcare team. Their involvement could also help healthcare team members to define nurses' expanded HIV clinical roles within the context of the healthcare facility setting, hence facilitating further the acceptance of nurses in these roles.

Furthermore, the findings of the current study indicate a great need for more public awareness of nurse-led ART clinics and engagement before their introduction. Public awareness and engagement are important if these clinics are to be acceptable to the community and patients. Advocacy is of particular importance because this study found that support and feedback from the community was imperative in motivating nurses to expend energy to execute expanded HIV clinical tasks. Policymakers can use these findings to support the implementation of mass media campaigns. These campaigns are necessary to raise community and patient awareness of the new nurses' roles and duties in HIV care. Public awareness and involvement are also important because nurse-led ART delivery models by design have at their core a patient-centred approach. Thus, it is imperative for policymakers to hear from the patients and the community directly to determine how, when, and where to engage nurses in expanded HIV clinical roles, as it enhances patient-centredness further.

This study also revealed that due to a national shortage of nurses in Uganda, the large-scale development of nurse-led ART services purely for medical substitution would reduce the nursing workforce available to provide essential nursing care and other critical healthcare services. It is only sensible to presume that if doctors' tasks in HIV care are shifted to nurses, nurses' tasks, in turn, must be shifted to other personnel to avoid work overload for them. To minimise depriving other critical healthcare service areas of nurses following the introduction of nurse-led HIV services, nurses, nursing assistants, and other community healthcare workers, should be recruited and trained appropriately before delegating to them some of the tasks currently performed by nurses. It is also critical that policymakers define the roles and responsibilities of these new healthcare providers to avoid inter-professional fights and work overload and to ensure that they are regulated and offered protection. It is also important that policymakers be aware that these new healthcare providers need support supervision, which may come mostly from the nurses. Thus, while updating nurses' job descriptions to include expanded HIV clinical roles and responsibilities, these supervisory roles will also need to be included. Policymakers should also direct the managers of healthcare facilities to avail time and opportunity to nurses to enable them to work in HIV clinics and to oversee the work of these new healthcare providers. To avoid the depletion of the nursing workforce from other essential healthcare service areas, holistic nurse-led services involving a combination of medical and nursing components to enable the provision of a more comprehensive health service should be developed. Such a comprehensive service may be an even more attractive option for patients as they will receive all their care and treatment needs from a single provider.

Nurse-led ART clinics should be promoted alongside strategies to increase patient empowerment and involvement in their care. People living with HIV should be brought on board to take greater responsibility in their care and to improve access and adherence to ART as the number of patients in need of this treatment continues to swell. However, policymakers should not forget that patients involved in their care need to be trained and supervised mostly by nurses, which increases demands on nurses' time and workload. Furthermore, due to limitations of the healthcare workforce and healthcare facility infrastructure, coupled with the growing number of patients requiring chronic HIV care,

policymakers will need to develop service delivery models that promote the management of stable patients within the community, as already done by The AIDS Support Organisation in Uganda. Such community-based delivery models will help decrease work overload for nurses in expanded HIV clinical roles and will reduce crowding at the HIV clinics thus increasing their efficiency and effectiveness. Policymakers will also need to bring on board the private sector to share patient loads, thus helping tackle the limitations to scaling up ART services imposed by the limited infrastructure and human resources for health in the public sector.

This study found that nurses in expanded HIV clinical roles experienced limited authority, autonomy, and conflict resulting from their existing job descriptions not including HIV clinical roles and responsibilities being proposed for nurses to run nurse-led ART clinics. In the short term, policymakers will need, therefore, to work with the UNMC to update nurses' job descriptions to reflect their expanded HIV clinical roles and responsibilities, authority, and lines of accountability, particularly those related to ART initiation prescription. Updated nurses' job descriptions can create a sense of professionalism, which may sustain their motivation to execute expanded HIV clinical tasks even when the working conditions are difficult. They can also enhance clarity of nurses' roles and responsibilities in HIV care, thus averting conflict resulting from the varied expectations of the different stakeholders due to role ambiguity. Thus, updated job descriptions will give nurses in expanded HIV roles the authority, autonomy, and greater confidence to do their work. Furthermore, the establishment of clear job descriptions can be a basis to determine competencies required to do the job, to provide better pre-service education and in-service training, and to set health care standards more explicit for nurses in expanded HIV clinical roles.

Since the current study also highlighted the importance of nurses' competencies and self-confidence in enabling nurses to execute expanded HIV clinical roles, in the long term, policymakers should closely work with nurse educators, managers of health services as well as with the UNMC to implement interventions that improve on nurses' competencies and self-confidence. As implied by this study, such interventions could include reforming nurses' pre-service education to including content on clinical reasoning. However, in the short-term as already discussed, it will be critical to review

the HIV in-service training to include disease diagnosis and treatment, urgently scale up HIV in-service training for the involved nurses, and intensify support supervision and mentorships, coupled with providing nurses with feedback on their performance. It is also critical that policymakers design strategies that will instil a culture of lifelong learning among nurses in expanded HIV clinical roles through creating opportunities and time to enable nurses to participate in continuous professional development activities. Institutionalising the culture and practice of lifelong learning is more likely to be effective in changing practice than stand-alone interventions such as off-site training. Mentorships and support supervision geared towards providing constructive feedback on performance and just-in-time training, as opposed to being merely faultfinding exercises are examples of interventions that could promote a culture of lifelong learning. It is also important that the competencies of supervisors and mentors be built through training and the pairing of senior-to-junior supervisors. Policymakers should also include supervisors' and mentors' new roles and responsibilities in their job descriptions as well as allocate time and opportunity to enable them to support nurses in expanded roles.

The current study revealed challenges related to the in-service HIV training course such as the lack of transparent selection criteria for nurses and other healthcare personnel to attend the HIV on-the-job training, which led to training the same individuals on the same course more than once. Policymakers and national-level managers will need to develop transparent selection criteria for nurses and other healthcare personnel to attend the HIV in-service training. They will also need to develop a database of those already trained. They will as well need to link training to career development programmes to improve training uptake and motivation of nurses and other healthcare workers involved in expanded HIV clinical roles. Furthermore, policymakers will need to sensitise managers of healthcare facilities about the need to support nurses who undertake education in HIV care to apply their new knowledge and skills through allocating time and opportunity for nurses to work in HIV clinics.

Policymakers will as well need to lobby for funds from the Ministry of Finance and donors to pay for all those capacity-building costs related to nurse-led ART clinics. They will also need to conduct costing studies of the nurse-led versus doctor-led ART delivery models to inform the decision-making process as to which delivery mechanism are most

cost-effective and feasible. In the same way, they will need to explore innovative strategies to reduce costs associated with capacity building for nurse-led ART clinics and nurses' motivation. Such strategies to reduce capacity-building costs include conducting on-site as opposed to off-site training and the use of mobile technology to offer supportive supervision and mentorships by experienced doctors and nurses, where in-person support is not always feasible. Using non-financial incentives, such as recognition and granting authority and autonomy to nurses in expanded HIV clinical roles could reduce motivation costs.

Because the current study showed that responsiveness to patients' needs was key to their acceptability of nurses as providers of ART, policymakers and national-level managers will need to implement interventions that take into consideration gender-sensitivity and interpersonal skills - issues patients in the current study valued. Policymakers and managers at national level will need to design programmes to train nurses in effective communication, and consider gender matching while selecting nurses to run nurse-led ART clinics. They should also take into account nurses' age, education level, and experience in HIV care when developing selection criteria for nurses to run these clinics, as this study found them to be important considerations for patients. They should also enhance the responsiveness of nurse-led ART clinics to patients' needs by providing essential amenities to promote privacy during consultations and promoting a team-based culture that makes nurses in expanded HIV clinical roles feel valued. Furthermore, they should train nurses in expanded HIV clinical roles to support patient self-management efforts, which will further enhance their responsiveness to patients' needs.

Policymakers and national-level managers also need to be aware that as nurses take up expanded HIV clinical roles, doctors' roles in HIV care will inevitably change. For example, as the country scales up ART further, treatment failure will become an important challenge, as will the provision of treatment and follow-up to special patient groups such as children, pregnant women, and HIV-positive patients with co-morbidities. Doctors will therefore not only have to provide care for patients with complications but will also need to provide technical oversight to nurses in expanded HIV clinical roles. These changes mean that both nurses' and doctors' roles will change, and thus their skills sets will need to be reviewed and upgraded to meet their new demands.

10.3 Recommendations for District and Healthcare Facility Managers

This study has identified that district and healthcare facility managers clearly have a pivotal role to play in reducing the numerous barriers and in enhancing the facilitators identified by the current study to influence the development and implementation of effective nurse-led ART clinics. They can do this by providing a working context that is conducive for nurses to execute expanded HIV clinical tasks. These managers should identify strategies that mitigate the barriers and enhance the facilitators to nurses acquiring the required pre-requisites: competencies, self-confidence, motivation, autonomy, authority, health system supports, and acceptability as providers of ART by patients and other stakeholders.

The current study has identified critical barriers to having in place the prerequisites for the development and implementation of effective nurse-led ART clinics at the healthcare facilities. They include: ambiguous nurses' roles and responsibilities in HIV care, the non-allocation of time and opportunity to nurses to work in HIV clinics by their managers, the lack of equipment and supplies, inadequate teamwork, and absence of HIV clinical guidelines, and inadequate managers' and doctors' support. Strong management and healthcare facility support that values patient-focused, multi-disciplinary, and goal-oriented care is required to overcome these barriers. Managers will need to arrange suitable facilities for nurses in expanded HIV clinical roles at an early stage. By managers addressing questions like why they need nurse-led ART clinics; what tasks nurses in expanded HIV clinical roles will fulfil and who will be responsible for their supervision; what facilities the nurses will need (for example HIV clinical guidelines and protocols, office space, and referral system) in advance can reduce the effects of the barriers experienced by these nurses.

Since the current study revealed that varied expectations of nurses' roles and responsibilities in HIV care among members of the healthcare team, resulting from role ambiguity, caused conflict and demotivation for nurses, managers of healthcare facilities will have to develop and disseminate operational guidelines about the roles and responsibilities of nurses in expanded HIV clinical roles in advance. They will need to communicate clearly these roles and responsibilities thereby facilitating collaboration

among nurses in expanded HIV clinical roles, doctors, and nurses in general nursing, among other team members. They will also need to manage altered working relationships resulting from task reallocation and boundary overlap between nurses in expanded HIV clinical roles and other healthcare providers, particularly doctors.

Because the current study revealed that low motivation has a negative impact on the performance of individual nurses and nurse-led ART clinics as a whole, it is critical that managers of health facilities work closely with policymakers to implement interventions that improve the motivation of nurses and other healthcare team members with a stake in the implementation of these clinics. This study found that low motivation among nurses was mostly related to low and non-commensurate pay, and to poor working conditions, which contributed to nurses' unwillingness to work in HIV clinics. Thus, managers of healthcare facilities and policymakers will need to lobby parliament for funds to ensure that nurses and other healthcare workers who take up expanded HIV clinical roles receive adequate wages if nurse-led ART clinics are to be effective and sustainable. Offering nurses in expanded HIV clinical tasks commensurate remuneration might attract many of them to HIV clinical work and might reduce nurses' high attrition rates revealed by the current study.

However, although commensurate salaries for nurses and other healthcare workers who take on extra work in HIV care provision is important in attracting and retaining them in HIV work, the current study also indicated that in Uganda, financial incentives alone would not solve the problem of low motivation among nurses in expanded HIV clinical roles. The study also implied that non-financial incentives such as those emphasising the reasons why nurses became healthcare workers in the first place are necessary. Nurses reported that they were strongly motivated by their desire to do good for their patients, which kept them going despite the numerous hardships they faced at their workplace. Since many nurses were demotivated and frustrated because they were unable to provide services to their patients due to a lack of means such as equipment and supplies, managers of healthcare facilities will need to take these issues into consideration when managing nurse-led ART clinics. They will need to improve nurses' motivation by addressing their professional goals through interventions such as recognition, career development, and further qualification. They will also need to grant nurses the authority

and degree of autonomy to make clinical decisions, as this is likely to improve nurses' attraction to, motivation, and retention in HIV work. These managers should as well show commitment to supporting nurses to execute expanded HIV clinical tasks by providing them with emotional support, support in resolving conflicts arising from changing roles, adequate working space, clinic equipment and tools, communication facilities, support with paperwork, and educational opportunities identified by the current study as critical. Managers of healthcare facilities will need, therefore, to develop a comprehensive strategy including the provision of both financial and non-financial incentives to maximise the motivation of nurses and other healthcare team members involved in the delivery of HIV services in nurse-led ART clinics.

This study also found that nurses' authority and autonomy to execute expanded HIV clinical roles was limited by other factors within the healthcare facility environment including a lack of managers' and doctors' support, and hierarchical management structures at the healthcare facilities. Limited nurses' authority and autonomy were also attributed to a failure of managers of healthcare facilities to grant nurses time and opportunity to work in HIV clinics to practice their new acquired knowledge and skills after the in-service HIV training. These managers should provide nurses with time and opportunity to work in HIV clinics.

This study has also revealed that for nurse-led ART clinics to be effective, nurses running them must work collaboratively within multidisciplinary teams and established relationships with doctors and other healthcare providers. These relationships create work conditions that can either facilitate or hinder expanded nurse HIV clinical role development. Thus, managers should implement interventions that promote good relationships among nurses in expanded HIV clinical roles, patients, and other healthcare providers. Such interventions include clarifying the roles and responsibilities of nurses in expanded HIV clinical roles as well as those of the different individuals involved in delivering HIV clinical services to avoid unnecessary conflicts among them. For example, managers of healthcare facilities will need to define how other healthcare workers will work with nurses in expanded HIV clinical roles to improve patient management. This study has pointed out that managers of healthcare facilities must pay greater attention to teamwork and accountability during the implementation of nurse-led

ART clinics and, therefore, will need to refine the model of care as the roles and responsibilities of the nurses in expanded HIV clinical roles, and those of other healthcare team members are clarified. Through this process, they will address issues of accountability, autonomy, collaboration, communication, and reporting mechanisms.

Because this study found doctors' support critical to the success of nurse-led ART clinics, managers of healthcare facilities will need to design strategies that bring them on board to support nurses in expanded HIV clinical roles. Such strategies could include inter-professional training and the involvement of the UMDPC in defining the purpose of nurse-led ART clinics to gain the acceptance of nurses as providers of ART. Furthermore, managers of healthcare facilities could mitigate professional protectionism by doctors who oppose delegating to nurses expanded HIV clinical tasks particularly that of ART initiation, by involving doctors early in the design and implementation activities of nurse-led ART clinics. They could also involve doctors in activities such as support supervision and mentorships of nurses in expanded HIV clinical roles. The early involvement of doctors in the course of developing nurse-led ART clinics could help in identifying solutions to their concerns, thus increasing their support for the initiative.

10.4 Recommendations for the Uganda Nurses and Midwifery Council

The UNMC has a critical role to play in putting the issue of nurse-led ART clinics on the policy agenda, and in mobilising the required political support. The UNMC is the one mandated by law to make proposals for extending the scope of practice of nurses, as well as defining the additional education and training requirements. The quality of HIV services provided by nurses in expanded HIV clinical roles will be questionable if they remain unregulated, and there is no control over those nurses' training. Thus, the nursing council will have to invest in policy and regulatory changes to ensure nurse-led ART interventions are developed within the law of the land. The UNMC will need to develop standards for nurses selected to run nurse-led ART clinics including competencies, licensing, pre-service education and in-service training, as well as mentorship. They should also develop accreditation and certification programmes to ensure that nurses who take on expanded HIV clinical roles provide safe services and are acceptable to stakeholders. The nursing council should also provide career paths, as well as recognise

those nurses who already have requisite competencies and have taken on tasks outside their scopes of practice.

However, policymakers at the MoH will need to bring the UNMC on board as well as support and resource them to undertake the necessary legislative and regulatory changes to support nurse-led ART clinics. The MoH leadership should work with the UNMC in the lead to create vision statements clearly articulating the purpose and benefits of nurse-led ART clinics. A clear vision has the high potential to reduce the uncertainty created by changes in roles and responsibilities of nurses in expanded HIV clinical roles, thus reducing problems associated with role ambiguity.

10.5 Recommendations for Nurses in Expanded HIV Clinical Roles

Acknowledging the role that nurses themselves can play in actively encouraging the successful development and implementation of effective nurse-led ART clinics is important. Several implications for nurses in practice are drawn from the results of the current study. For example, findings that patients prefer ART healthcare providers who display person-centred care attributes, who are honest, treat them with politeness, respect their culture and beliefs, display empathy, as well as give time to patients during consultations provides valuable information, which nurses in expanded HIV clinical roles should recognise.

Established therapeutic relationship with their ART care provider was especially meaningful to patients. Patients in the current study also valued nurses who are competent and who know when to consult or to refer. Nurses in expanded HIV clinical roles, therefore, must master interpersonal skills that enable them to be responsive to patients' needs if they are to be acceptable to patients. They will need to develop good interpersonal skills by adopting a holistic approach and allowing time for patients to feel respected and treated as unique individuals, which builds trust between them. Nurses should endeavour to develop their competencies in communication, interdisciplinary teamwork, and negotiation to enable them to work in teams and to advocate for their patients' needs, as well as be able to provide technical services.

To promote good rapport with patients, nurses in expanded HIV clinical roles should use person-centred concepts identified in the current study to be meaningful to patients. In practice, they will need to understand their patients first. They will need to be available and approachable to their patients if they are to establish a therapeutic relationship with them. They should revisit the holistic person-centred focus of nursing and consider the patient as a whole person rather than as an illness or disease. They should treat patients with respect and as unique individuals. They should also display a caring and positive attitude while encouraging patients to give them confidence and reduce their anxiety. Nurses must realise the importance of developing mutual trust with their patients by being open as well as competent. The reaffirmation of person-centred care as part of HIV care can also improve health outcomes. This improvement is likely to occur because patients feel heard, believed, and remembered. It is likely that as patients develop trust for nurses in expanded HIV clinical roles, their health behaviour and commitment to management of their disease condition will improve.

10.6 Recommendations for Education

Although the current study identified competencies, in particular, clinical reasoning skills, as a prerequisite for nurses to be able to execute expanded HIV clinical roles, Uganda's nurse education system, perceived by participants to be characterised by inexperienced tutors and role models, the inadequate content of the curriculum, and inappropriate methods of delivery, limits nurses from acquiring critical clinical reasoning skills necessary for taskshifting. The finding that study participants believed nurses in Uganda lacked clinical reasoning skills, a belief also confirmed by nurses' poor performance in domains of HIV clinical care involving clinical reasoning, needs the attention of nurse educators. If nurse-based task shifting is to be implemented effectively and sustainably in Uganda, nurse educators will need to reform Uganda's pre-service nursing education system to enhance its capacity to prepare student nurses to relate theoretical knowledge to practice, thus enhancing their clinical reasoning skills. During the curriculum review, nurse educators should place emphasis on the domains of making an accurate diagnosis and coming up with a correct treatment plan, in which nurses performed poorly in the HIV clinical vignettes. Exposure to clinical reasoning skills at the pre-service level probably has the highest potential to influence nurses' interest in it.

Pre-service training should also include content on HIV care including the provision of ART.

Furthermore, because this study highlighted the importance of teamwork in enabling nurses to execute expanded HIV clinical tasks, in the long term, it is critical that nursing educators work with others to revise the curricula across all healthcare professional training programmes. They should include components addressing inter-professionalism to familiarise all health professionals with the roles, responsibilities, and scopes of practice of their colleagues in the revised curricula. Nurse educators should also support the MoH to update the Uganda HIV in-service training curriculum to incorporate content necessary to build the clinical reasoning competencies of nurses. Educators will also need to ensure that both the pre- and in-service curricula are approved and accredited by the UNMC to standardise, monitor, and recognise nurses who undertake the training.

However, on a cautionary note, making changes in curricula is not a straightforward process as it has serious implications for professional boundaries, hierarchies, responsibilities, and remuneration issues. Changing the course content will not only require the broad participation of nurse educators, but will also necessitate the involvement of policymakers, professional associations, regulatory bodies, donors, and patients' groups. The involvement of the various stakeholders, even though essential in enhancing the acceptability and legitimacy of curriculum change, may limit the scope and speed of decision-making as the different stakeholders have competing interests. Nurse educators need to be aware of these difficulties arising from multiple stakeholder engagement to devise strategies to mitigate them.

Lastly, there is a need to empower nurse educators through training them in clinical reasoning, and in HIV care and treatment, if they are to create a suitable educational environment for student nurses to build their competencies and self-confidence in clinical reasoning. Furthermore, there is a need for nurse educators to be counselled and motivated to increase their personal interest in clinical reasoning activities if they are to act as role models and mentors for student-nurses in this area of practice. Recommendations for research are discussed next.

10.7 Recommendations for Research

Even though this study found that nurses' ability to execute expanded HIV clinical roles is influenced by numerous factors ranging from the patient and community to personal nurse environments, with nurses' competence, self-confidence, motivation, authority, autonomy and acceptability of nurses as providers of ART by patients and other stakeholders as the pre-requisites, there are still many unknowns. For instance, it remains unclear which factors have the most significant effect and how they act and interact to influence the development and implementation of nurse-led ART clinics in practice. It is also unclear if there are any other factors not identified in the current study, which might influence the development and implementation of effective nurse-led ART clinics in Uganda.

Furthermore, it is unclear which interventions or combinations of them are useful in mitigating the numerous barriers, identified by the current study, to the development and implementation of effective of nurse-led ART clinics. For example, while nurses' motivation is identified as a nurse-level outcome measure and thus a critical pathway through which numerous factors influence the effectiveness of nurse-led ART clinics and that it could be enhanced by both financial and non-financial incentives, it is still a conundrum as to which specific incentives or combinations of them are effective in motivating nurses to execute expanded HIV clinical tasks. In addition, while the results of the present study have strongly suggested that nurses in expanded HIV clinical roles are likely to function better in interdisciplinary teams, it is still ambiguous how teamwork should be promoted. Lastly, while this study has found that patients accept nurses in expanded HIV clinical roles mainly because of their excellent interpersonal skills, it remains unclear if patients will continue to accept them when nurse-led ART clinics are eventually authorised which may result in increased workloads for nurses thus limiting the time available to them to consult with their patients.

Given these unknowns, it is reasonable to conclude that the findings of the current study are only foundational in identifying factors that may act as either facilitators or barriers to developing and implementing effective nurse-led ART clinics in Uganda and similar settings with weak health systems. These findings could be the basis for further research

to determine which factors have the greatest effect and if any other factors influence the effectiveness of nurse-led ART clinics in practice. I recommend a Delphi study involving patients, policymakers, donors, nurses, and doctors to determine the most important factors influencing the development and implementation of effective nurse-led ART clinics. More studies are required to provide evidence on which interventions or combinations of them will promote teamwork during the implementation of nurse-led ART clinics at healthcare facilities. The findings of this study could also be used as a baseline to determine what factors are likely to influence the development and implementation of nurse-led ART clinics when structural barriers, particularly those related to the absence of legislation to allow nurses to execute expanded HIV clinical tasks, are eventually addressed. For instance, qualitative studies using case studies or grounded theory could be conducted to illuminate further on patients' acceptability of nurses as ART providers when nurse-led ART clinics are eventually introduced. I firmly believe that the findings of this study will inform future research in this area. The conclusion of this thesis is presented in the next chapter.

11 Conclusion

The introduction of nurse-led ART clinics in primary healthcare facilities is one of the innovative ways that the GoU plans to use to address the growing demand for HIV services amidst the current shortage of doctors. However, there is limited evidence on the factors that affect the development and implementation of effective nurse-led ART clinics in Uganda and similar settings, which have a high burden of HIV coupled with weak health systems. Furthermore, there is little information available on nurses' competencies in delivering HIV care in a non-interventional context. Worse still, conceptual frameworks to guide the development and implementation of effective nurse-led ART clinics and to guide further research on the subject are yet to be developed.

Before redesigning the healthcare system to enable the introduction of effective nurse-led ART clinics, it is important to understand what factors acting as facilitators or barriers might be expected in this endeavour. If these factors are not considered, they might hamper the effectiveness of nurse-led ART clinics in actual practice. To bridge the identified knowledge gap, I conducted descriptive cross-sectional studies with patients, nurses, doctors, policymakers, national ART trainers, regional ART coordinators, and officials from the professional nursing and medical councils using questionnaire surveys, semi-structured interviews, focus group interviews, and paper-based HIV clinical vignette tests.

Several potentially widely applicable insights have emerged from this study regarding the scaling-up and sustainability of task-shifting interventions. Like existing literature, the present study has revealed that nurse-led ART clinics are already operating on a wide scale in Uganda, though on an ad hoc basis, and stakeholders view them as a key strategy for scaling up HIV services, including ART initiation and management. This study has also revealed that despite the numerous challenges nurses face at their workplace, most of them are willing to take on expanded HIV clinical tasks, are competent, and are acceptable to patients, at least to manage uncomplicated HIV-related disease conditions.

Importantly, this study has revealed that the successful development and implementation of effective nurse-led ART clinics is influenced by numerous factors within the patient and community, policy and funding, wider health system, healthcare facility, and personal nurse environments. The multiplicity of factors, which act as barriers or facilitators, indicates the complexity and challenges of developing and implementing effective nurse-led ART clinics. Evidently, there is variation among these factors, as facilitators can become barriers if not addressed appropriately. Conversely, barriers can change to facilitators. Moreover, this study has revealed that interactions amongst these factors present significant influences on the effectiveness of nurse-led ART clinics. Acknowledging the different factors and the interactions amongst them has serious implications calling for system-wide interventions that do not address single factors but target multiple factors and the interactions amongst them if nurse-led ART clinics are to be developed effectively and sustainably. A critical observation from this study also is that many of the barriers to the development and implementation of effective nurse-led ART clinics arise from the ad hoc nature these clinics are introduced, and from the limitations intrinsic of weak poorly resourced Ugandan health system. The unplanned introduction of nurse-led ART clinics leads to their ineffectiveness because it is unclear what needs nurses in expanded HIV clinical roles are addressing, which in turn creates poor stakeholder buy-in, limited resources, confusion, conflict, inconsistent expectations, reduced authority and autonomy, and demotivation for nurses. Thus, planning and a wider investment in human resources and strengthening of the health system are more desirable.

Notably, also, this study identified nurses' competencies, self-confidence, motivation, authority, autonomy, and systems and human resource support, as well as the acceptability of nurses as providers of ART by patients and other stakeholders as the prerequisites for the development and implementation of effective nurse-led ART clinics. These prerequisites summarise and might explain how factors within the different environments act as facilitators or barriers to the development and implementation of effective nurse-led ART clinics in Uganda. Appreciating factors that affect the prerequisites and how they do so might thus be critical to understanding and theorising the development and implementation of effective nurse-led ART clinics, even though further research is required.

From a knowledge generation perspective, these prerequisites add to our understanding of how factors within the different environments influence the development and implementation of effective nurse-led ART clinics and alert policymakers to the prerequisites that are needed to enhance development and implementation of effective nurse-led ART clinics. From a research perspective, the prerequisites can be used to sensitise researchers to areas needing further study. Although further research is required, I postulate that the prerequisites for development and implementation of effective nurse-led ART clinics identified by the current study will be very useful when developing and implementing effective nurse-led ART clinics in the future.

Apparent from the current study also is that the development and implementation of effective nurse-led ART clinics is complex and context-sensitive, making their standardised introduction undesirable and impossible. Policymakers, managers of healthcare services, educators, and researchers, therefore, must plan adequately for interventions that are adaptable to the various contexts if nurse-led ART clinics are to be introduced successfully and sustainably. While planning, they should particularly focus on addressing the numerous barriers identified by the current study to curtail nurses' competencies, self-confidence, motivation, authority, autonomy, availability of systems and human resource support, and the acceptability of nurses as providers of ART by patients and other stakeholders.

The current study has provided me with an opportunity to consolidate the literature and obtain the input of study participants (who are key stakeholders) to identify facilitators and barriers to the development and implementation of effective nurse-led ART clinics in Uganda. While further research is required to establish which of the factors identified by this study are critical in influencing the effectiveness of nurse-led ART clinics in practice, the current study provides significant insights into the development and implementation of these clinics. Specifically, this study has produced four significant outputs, which are related. First, it has identified the prerequisites for the development and implementation of effective nurse-led ART clinics and expanded our knowledge of how the different factors acting as facilitators or barriers influence the development and implementation of effective nurse-led ART clinics. Second, it has identified potential facilitators and barriers to the introduction of effective nurse-led ART clinics in public

health systems in resource-limited settings. Third, it has identified a clear knowledge gap on which further research on the development and implementation of effective nurse-led ART clinics should be focused. Fourth, it has culminated in the development of a robust and transferable evidence-based conceptual framework of factors that influence the development and implementation of effective nurse-led ART clinics to guide the systematic study and implementation of task shifting.

As Uganda and other countries, particularly in SSA, continue to look to nurses to increase access to health care by extending nurses' scope of practice, developing best practices for their development and implementation is imperative. The consideration of the facilitators and barriers as well as the prerequisites might thus contribute to finding best practices as we continue to expand our knowledge of how to develop and implement effective nurse-led ART clinics. An important advantage of the modified framework is that it facilitates identification of resource needs, barriers, and facilitators for implementing effective nurse-led ART clinics and their mechanisms of influence. With this framework, policymakers can make informed decisions about the introduction of nurse-led ART clinics, set realistic outcomes, and implement strategies to overcome the barriers. I encourage other researchers to test the proposed conceptual framework for the development and implementation of effective nurse-led ART clinics in practice.

Based on the findings of this study, I have formulated recommendations for policy, practice, education, and research that I trust will ensure the successful development and implementation of effective nurse-led ART clinics. I strongly believe that nurses can contribute significantly to the provision of recommended HIV services if the numerous factors and the interactions amongst them to influence the effectiveness of nurse-led ART clinics are considered. I now look to policymakers and nursing leaders in Uganda to facilitate the implementation of these recommendations and ultimately support a planned introduction of nurse-led ART clinics in the Ugandan healthcare system.

12 References

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13 Appendices

Appendix 1: Questionnaire to assess patients' experiences with, and attitudes and views towards nurses as providers of expanded HIV clinical services including ART

S/N	Section A: Interview Identification Information	
ID 1	Name of the clinic	
ID 2	Code of the clinic	
ID3	Date of interview	
ID4	Interviewer's code	

S/N	Section B: Study Participants' Demographic Information (Circle one)		
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1	What is your age?	18-34	1
		35-49	2
		50-64	3
		More than 65	4

2	Sex	Female	1
		Male	2
3	Have you ever attended school?	Yes	1
		No	2

4	What is the highest level of education did you attend?	No formal education (<i>Circle one</i>)	1
		Primary not completed	2
		Completed primary school	3
		Secondary not completed	4
		Secondary ordinary level	5
		Secondary advanced level	6
		Technical college	7
		College (e.g. teaching, police etc)	8
		University	9
		Other (specify)	10
5	What is your occupation?	Professional (e.g. Teacher, Nurse, police) (<i>Circle one</i>)	1
		Skilled (e.g. tailor, hair dresser)	2
		Worker in the service industry	3
		Peasant	4
		House wife	5
		Other(specify)]	6
6	How far away do you live (km approx)?	(<i>Circle one</i>) Less than 5 kms	1
		5 to less than 10 kms	2
		10 to less than 20 kms	3
		More than 20 kms	4
7	When were you diagnosed as having HIV?	(<i>Circle one</i>) Less than 1 year ago	1
		More than 1 year to 2 years	2
		More than 2 years to 3 years	3

		More than 3 years to 4 years	4
		More than 4 years to 5 years	5
		More than 5 years	6
8	Who diagnosed HIV in you?	Nurse	1
		Doctor	2
		Both	3
9	When did you start ART	6 to 11 months	1
		1 to 2 years	2
		more than 2 years	3
10	How do you feel about your health condition today?	Well	1
		Unwell	2
		Unsure	3
11	Who do you normally see when you come for your HIV care including ART?	Nurse	1
		Doctor	2
		Both	3
12	In the last one year , have you received ART from?	Nurse only clinic	1
		Doctor only clinic	2
		Both	3
13	Severity of disease condition at the time of diagnosis? (From the records)	(Circle one)	
		WHO clinical stage I	1
		WHO clinical stage II	2
		WHO clinical stage III	3
		WHO clinical stage IV	4

14-19	Perceived ART trained nurses' characteristics necessary to provide high-quality ART care
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S/N	Which of the following characteristics are essential for an ART trained nurse to provide good ART care?		
14	If you were to receive ART from an ART trained nurse only clinic, would her (/his) age matter to you?	Yes	1
		No	2
		Unsure	3
15	What should be the appropriate age for an ART trained nurse?	Between 18 – 30 years	1
		Between 30 -39 years	2
		Above 40 years	3
		N/A	4
16	Is it important to you that the nurse who provides you with care is male or female?	Yes	1
		No	2
		Unsure	3
17	If yes, what nurses' gender (male or female) do you prefer to receive ART from?	Female	1
		Male	2
18	Does the education level of a ART trained nurse providing ART to you matter?	Yes	1
		No	2
		N/A	3

19	If yes what should the minimum education level of the ART trained nurse providing you with care be?	Nursing certificate Diploma Degree Other specify N/A	1 2 3 4 5
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20	ARV clients' experience with HIV specific tasks received from nurses
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S/N	Which of the following ART specific activities have you ever received from an ART trained nurse	Yes (1)	No (2)	N/A or unsure (3)
20.1	History taking (asking questions about your illness so that so to understand your illness better)			
20.2	Education about HIV disease- prevention			
20.3	Education about the importance of taking your medicines			
20.4	Ordering laboratory investigations			
20.5	Interpreting laboratory results			
20.6	Making a diagnosis of your illnesses (OIs)			
20.7	Prescribing medicines for OI prophylaxis-cotrimoxazole			
20.8	Prescribing medicines for other illnesses (OIs)			
20.9	Assessing for your ART eligibility			
20.10	Initiating your ART			
20.11	Treatment of illnesses such as oral thrush, HZ			
20.12	Managing common drug side effects			
20.13	Managing severe drug side effects			
20.14	Management of your ART and TB			
20.15	Management of your ART and meningitis			
20.16	Follow you up while on ART			
20.17	Changing your ARV medicines when the 1st ones failed			
20.18	Referring you when you developed a difficult condition			

21	Comparison between nurses and doctors in the provision of HIV-related specific care tasks
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S/N	According to you between nurses and doctors who of them provides the following ART activities better?	Doctors (1)	Nurses (2)	Same or N/A (3)
21.1	History taking (asking questions about your illness so that so to understand your illness better)			
21.2	Education about HIV disease- prevention			
21.3	Education about the importance of taking your			

	medicines			
21.4	Ordering laboratory investigations			
21.5	Interpreting laboratory results			
21.6	Making a diagnosis of your illnesses (OIs)			
21.7	Prescribing medicines for OI prophylaxis-cotrimoxazole			
21.8	Prescribing medicines for other illnesses (OIs)			
21.9	Assessing for ART eligibility			
21.10	Initiating ARV medicines			
21.11	Treatment of illnesses such as oral thrush, HZ			
21.12	Managing common drug side effects			
21.13	Managing severe drug side effects			
21.14	Management of ARV clients who develop TB			
21.15	Management of ARV clients who develop meningitis			
21.16	Follow-up of patients on ART			
21.17	Switching PLHIV on 2nd line ART			
21.18	Referral of PLHIV with difficult conditions.			

22	ARV clients' willingness to receive specific HIV-related care tasks from ART trained nurses
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S/N	Which of the following services are you willing to receive from an ART trained nurse?	Yes (1)	No (2)	Unsure (3)
22.1	History taking (asking questions about your illness so that so to understand your illness better)			
22.2	Education about HIV disease- prevention			
22.3	Education about the importance of taking your medicines			
22.4	Ordering laboratory investigations			
22.5	Interpreting laboratory results			
22.6	Making a diagnosis of your illnesses (OIs)			
22.7	Prescribing medicines for OI prophylaxis-cotrimoxazole			
22.8	Prescribing medicines for other illnesses (OIs)			
22.9	Assessing for ART eligibility			
22.10	Initiating ARV medicines			
22.11	Treatment of illnesses such as oral thrush, HZ			
22.12	Managing common drug side effects			
22.13	Managing severe drug side effects			
22.14	Management of ARV clients who develop TB			
22.15	Management of ARV clients who develop meningitis			
22.16	Follow-up of patients on ART			
22.17	Switching PLHIV on 2nd line ART			
22.18	Referral of PLHIV with difficult conditions			

S/N	Which of the following statements do you agree with (ARV clients' perception of nurses'?	Yes (1)	No (2)	Neutral (3)
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	competencies)			
23	Diagnosis of illness in PLHIV should be the role of the doctor and not a trained ART nurse			
24	Treatment of OIs in PLHIV should be the role of the doctor and not a trained ART nurse			
25	Trained ART nurses should not be allowed to start PLHIV on ART.			
26	Trained nurses can provide HIV care including ART initiation just as good as doctors do.			
27	I do not mind whether I receive ART from a trained nurse or doctor.			
28	The trained nurse should only treat PLHIV on prophylactic treatment such as septrin and not those on ART.			
29	Trained nurses in nurse-run ART clinics should always work with doctors present			
30	Trained nurses can provide ART well without the help of doctors.			

S/N	Choose one--Between a nurse and a doctor who do these activities better?	Doctors(1)	Nurses(2)	Same(3)	Unsure(4)
	ARV clients' perception of nurses' and doctors' competencies				
31	Has no doubt in their diagnosis of disease				
32	Provides you with better clinical outcomes				

S/N	Which of the following statements do you agree with	Yes (1)	No (2)	Neutral (3)
Benefits of nurse-led ART				
33	The introduction of ART clinics run by trained nurses would help reduce the waiting times for PLHIV			
34	The introduction of ART clinics run by trained nurses would help increase the number PLHIV receiving ART			
35	ART clinics run by a ART trained nurse will improve existing care provided to PLHIV.			
36	Trained nurses increase the range of services available in the ART clinic			

S/N	Which of the following statements do you agree with	Yes (1)	No (2)	Neutral (3)
Over all acceptability of nurse led ART clinics				
37	Would you recommend your friends to seek care from a nurse led ART?			

38	Given choice between doctor led ART clinic and nurse run only ART clinic would you choose a nurse run ART clinic?			
39	Should the government introduce nurse led ART clinics?			

S/N	Between a nurse and a doctor, who does the following activities better? (choose one)	Doctors (1)	Nurses (2)	Same (3)	Unsure or NA (4)
	Inter personal relations (provision of information, empathy with and attitude towards the patient)				
40	Meets your emotional needs (meeting your concerns about HIV in general , ART and its consequences)				
41	Has a good personal knowledge of your health condition				
42	Respects you as a patient including your beliefs				
43	Ensures your privacy during consultations				
44	Does not share information about you with anyone else unless you agree				
45	Promotes or supports your needs				
46	Provides equal care to all patients without discrimination				
47	Involves your family in supporting care provision				
48	Talks to you clearly				
49	Listens to you in a way that makes you feel comfortable				
50	Examines you in a way that makes you feel comfortable				
51	Talks to you respectfully (not rudely)				
52	Helps you to increase your knowledge and understanding about the disease (HIV) and your medicines				
53	Gives you sufficient time during consultation				

S/N	Which of these statements do you agree with?	Yes (1)	No (2)	No comment (3)
54	Do you think patients should be able to complain about healthcare workers if things go wrong?			

Appendix 2: Information Sheet

Hello there

The GoU is in the process of introducing nurse-led antiretroviral treatment (ART) clinics where nurses will be trained and allowed to initiate first line ART in uncomplicated cases at primary healthcare facilities. The nurses will also be able to refer the complicated cases to bigger hospitals. Before nurse-led ART clinics are put in place, it is important to hear your views about them. Your views will help us make recommendations to the ministry of health on how best to implement this programme. You have been identified as a potential participant for this study entitled *'The feasibility of expanding ART in resource-limited settings using a nurse-led delivery model: Uganda as a case study.'*

This research is being carried out by a team of three researchers led by Eric Ikoona, a research degree student at London School of Hygiene and Tropical Medicine. Your participation would consist of an interview lasting 1 to 1 ½ hours in a location of your choice. You will be discussing your experiences with or views on nurse-led ART delivery model.

If you agree to participate, then you will be contacted by Eric Ikoona to arrange a convenient time and place for the interview.

Thank you for considering taking part in this important research.

Appendix 3: Consent Form for Patient-participants

Introduction and purpose of study

The GoU is in the process of introducing nurse-led antiretroviral treatment (ART) clinics where nurses will be trained and allowed to initiate first line ART in uncomplicated cases at primary healthcare facilities. The nurses will also be able to refer the complicated cases to bigger hospitals. Before nurse-led ART clinics are put in place, it is important to hear your views about them. Your views will help us make recommendations to the ministry of health on how best to implement this programme. You have been identified as a potential participant for this study. It is important that you understand that your taking part in the study is completely voluntary. Any information that you give us will remain secret – your name will not be written on the same sheet as your answers.

Study Procedures

- The questions will be read out to you by the interviewer, who will record your answers.
- There are about 20 questions, and it will take between forty-five minutes to sixty minutes to finish answering all of them.
- If you are not certain about the meaning of any of the questions, you can ask the interviewer for clarification.
- You may refuse to answer any question.
- You may withdraw your participation from the study at any point during the interview without penalty or without in any way affecting any of your entitlements.
- At the end of the interview, we will give you a small gift of 1000 shillings to thank you for your time and for helping us.

Risks and benefits

There are no costs or risks to you of participating.

The benefit of participating is that you will be able to share your experiences, and may play a part in changing policies to better support PLHIV.

If you have any questions about this study, you should contact: Eric Ikoona, Tel 0772424680

Appendix 4: Consent form for in-depth interviews

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please kindly take time to read this sheet carefully. Ask us if there is anything that is not clear or if you would like more information.

The aim of this study is explore the views of PLHIV, nurses, doctors and key informants on the nurse-led ART delivery model. This information will help us better understand the issues surrounding the development of a nurse-led ART delivery model so that we make evidence based recommendations to the ministry of health. Information collected from you will be treated confidentially and you will not be personally identified in any report of the study. Knowledge gained from the study may benefit humankind.

Your participation is voluntary. You are free to ask any questions about the study before giving consent to participate and that you may freely withdraw from the study anytime without penalty or without in any way affecting any of your entitlements.

I understand that the study involves: Being interviewed on my opinions about the nurse-led ART delivery model.

I freely consent to take part in the study and I understand that I can ask any further questions regarding this study or contact Eric Ikoona on telephone number 0772547494 for any information in relation to the study.

Participant's name	Participant's signature	Date

Interviewer's name	Interviewer's signature	Date

Witness's name	Witness's signature	Date

Appendix 5: Moderator's guide for FGDs with patient-participants to explore the emerging themes from the survey

After giving the study participants the information sheet and obtaining informed consent.

Section A

The GoU is proposing to introduce nurse-led ART delivery clinics, where nurses who have been trained in ART management would provide the majority of routine, ongoing care for PLHIV including those on ART. The nurses will be able to initiate ART in un-complicated cases, monitor for drug side effects and treatment progress. They will be able to refer the complicated cases to bigger ART facilities with doctors for further management.

Section B

1. How do ARV clients define good health care provider aspects of quality of care during ART?
2. What are the necessary qualities of a good ART provider? And why?
3. What are the criteria that you use to judge a good healthcare provider?
4. What do you think about ART care provided by nurses working independently of doctors? Probe for the quality, interpersonal relations.
5. What ART services are you willing to receive from nurses?
6. Do nurses have the necessary education and qualifications to provide effective ART?
7. Are you and your other colleagues willing to receive ART from nurses? If yes, why? And if no, why not?

Appendix 6: Moderator's Guide for Nurses' Interviews

Topic guide to explore nurses' views on the nurse-led ART delivery model.

After giving the study participant the information sheet and obtaining informed consent.

Section A

The GoU is proposing to introduce nurse-led ART delivery clinics, where nurses who have been trained in ART management would provide the majority of routine, ongoing care for PLHIV including those on ART. The nurses will be able to initiate ART in uncomplicated cases, monitor for drug side effects and treatment progress. They will be able to refer the complicated cases to bigger ART facilities with doctors for further management.

Section B

1. What is your experience with providing ART?
2. What are some of the challenges that you have encountered during the provision of ART?
3. What positive things have you encountered during the delivery of ART?
4. Please can you give any comments, positive or negative, about the proposed nurse-led ART delivery model? (Probe, what does a nurse-led ART delivery model mean to you?)
5. What positive impact in the provision of HIV care including ART do you think the nurse-led ART clinics will bring about?
6. Do you think the nurse-led ART delivery model will compromise the quality of care by leaving less time for 'basic' nursing care?
7. What effect do you think will your new roles in the nurse-led ART delivery model have on your job satisfaction?
8. How will your new role in ART affect your working relationship with doctors and other healthcare providers? (Probe for whether they expect to get support from them?)
9. How will this new role in ART delivery affect your relationships with your patients?
10. Are you confident to provide ART?

Probe (If they feel confident, which tasks are they confident in and why? And if not why?)

11. Which tasks in ART are you able to provide?

12. What do you think will help you to better carry out your new roles in ART provision?

Probe (for what education and professional experiences do you regard as necessary for the assumption of an autonomous role in ART care).

13. Is there enough support by the health system to enable you provide ART?

14. What support systems do you think will make it easy for you to effectively give ART? probe about (working conditions, monitoring systems, clarity of responsibilities, presence of guidelines, training, laboratory facilities, working rooms, furniture and communication facilities).

15. What do you expect to gain from the nurse-led ART delivery model? Probe for (self-efficacy, individual goals/values and readiness to change).

16. What suggestions do you propose to make sure that the nurse-led ART delivery model works very well?

17. Is there anything else you would like to tell me or ask me?

Section C

S/N	Question	yes	No
1	Do you think the nurse-led ART delivery model will be of interest to other providers like yourself?		
2	The nurse-led ART delivery model will lead to nurses being used as a means of reducing doctors' workloads.		
3	The nurse-led ART delivery model perpetuates the role of nurses as doctors' hands and off-loads doctors of their routine tasks.		
4	The nurse-led ART delivery model will increase the continuity of care of PLHIV on ART.		
5	Do you think the nurse-led ART delivery model will lead to nurses being used by the government to save money?		
6	The nurse-led ART delivery model will lead to increased collaboration and cooperation between nurses and doctors?		
7	The nurse-led ART delivery model will lead to nurses having less time for true nursing activities?		
8	The nurse-led ART delivery model will lead to nurses meeting the new needs in ART delivery?		

9	The nurse-led ART delivery model will increase the workload of nurses and make nurses more stressed?		
10	The nurse-led ART delivery model will improve the quality of ART care		
11	The nurse-led ART delivery model will enhance the quality of care by promoting a more holistic approach that looks at patients as a whole as opposed to a disease?		
12	The nurse-led ART delivery model will compromise the quality of care by leaving less time for 'basic' nursing care.		
13	The nurse-led ART delivery model will increase job satisfaction for nurses		
14	The nurse-led ART delivery model will fragment care as more care assistants will undertake basic nursing care?		
15	The nurse-led ART delivery model will benefit PLHIV from a full range of nurses' skills?		
16	The nurse-led ART delivery model will increase professionalism in nursing?		
17	Do you think the nurse-led ART delivery will devalue the essential value of 'basic' nursing care?		

Appendix 7: Moderator's Guide for Doctors' Interviews

Topic guide to explore doctors' attitudes towards the nurse-led ART model.

After giving the study participant the information sheet and obtaining informed consent.

Section A

The GoU is proposing to introduce nurse-led ART delivery clinics, where nurses who have been trained in ART management would provide the majority of routine, ongoing care for PLHIV including those on ART. The nurses will be able to initiate ART in uncomplicated cases, monitor for drug side effects and treatment progress. They will be able to refer the complicated cases to bigger ART facilities with doctors for further management.

Section B

1. What is your experience of nurses as providers of ART?
2. Please can you give any comments, positive or negative, about the proposed nurse-led ART delivery model? (Probe, what does a nurse-led ART delivery model mean to you?)
3. What positive impact in the provision of HIV care including ART do you think the nurse-led ART clinics will bring about?
4. What is your opinion about the quality of ART provided by nurses in nurse-led ART clinics?
5. What is your opinion about how the nurse-led ART delivery clinics will affect other 'basic' nursing care?
6. How will the nurses' new role in ART affect working relationships with doctors and other healthcare providers? (Probe for whether they will support the initiative)
7. How will the nurses' new role in ART delivery affect the nurses' relationships with the patients? (Probe whether they think that patients will support this move.)
8. What do you think about the skills and knowledge of nurses to provide ART?
9. Which tasks in ART delivery do you think nurses competently offer?

10. What do you think will help the nurses to better carry out their new roles in ART provision?

Probe for what education and professional experiences you regard as necessary for the assumption of an autonomous role in ART care.

11. Is there enough support by the health system to enable nurses to provide ART?

12. What support systems do you think will make it easy for nurses to effectively give ART? probe about (working conditions, monitoring systems, clarity of responsibilities, presence of guidelines, training, laboratory facilities, working rooms, furniture and communication facilities)

13. What suggestions do you propose to make sure that the nurse-led ART delivery model works very well?

14. Do you support the nurse-led ART delivery?

15. Is there anything else you would like to tell me or ask me?

Appendix 8: Moderator's guide for other stakeholders (key informant interviews)

Topic guide to explore key informants' views on the nurse-led ART model

After giving the study participant the information sheet and obtaining informed consent.

Section A

The GoU is proposing to introduce nurse-led ART delivery clinics, where nurses who have been trained in ART management would provide the majority of routine, ongoing care for PLHIV including those on ART. The nurses will be able to initiate ART in un-complicate cases, monitor for drug side effects and treatment progress. They will be able to refer the complicated cases to bigger ART facilities with doctors for further management.

Section B

1. What has been your experience of nurses as providers of ART?
2. What do you think about the skills and knowledge of nurses to provide ART?
3. Which tasks in ART delivery do you think nurses competently offer?
4. What do you think will help the nurses to better carry out their new roles in ART provision?

Probe for what education and professional experiences do you regard as necessary for the assumption of an autonomous role in ART care.

5. Is there enough support by the health system to enable nurses to provide ART?
6. What support systems do you think will make it easy for nurses to give ART effectively? Probe about (working conditions, monitoring systems, clarity of responsibilities, presence of guidelines, training, laboratory facilities, working rooms, furniture and communication facilities)
7. Do you support the nurse-led ART delivery model?
8. What suggestions do you propose to make sure that the nurse-led ART delivery model works very well?
9. Is there anything else you would like to tell me or ask me?

Appendix 9: HIV Clinical Vignettes

Instructions

Answers in bold represent the most relevant answers, and are worth one point; answers not in bold are also potentially useful, mostly preventive in nature, but not as high-priority as those in bold, and are worth 0.8. Other answers are worth zero.

Note that scoring should allow for different ways to pose individual questions, so long as the nurse or doctor is clearly trying to get at the same information.

If the nurse or doctor has provided more answers than the instructions require, score the responses in the order that the nurse or doctor wrote them until you have reached the requested number of answers. Disregard any additional answers.

Case: HIV Clinical Vignette 1 Simple: Pulmonary Tuberculosis Disease in HIV-Positive Patient

Chief complaint: A 49-year old man comes to the HIV clinic with a newly diagnosed HIV infection, a CD4 lymphocyte count of 12 cells/mL, and a cough.

As the primary healthcare worker who sees the patient first, what are some of the first 5 most important questions you might ask this patient about his cough and his general health in the recent past (the history of his present illness)?

Answers: (maximum possible score is 5)

- **How long has the patient had these symptoms?**
- **Does the cough come and go?**
- **Is it a dry or a wet cough?**
- **Is the patient expectorating sputum? If so, what color is the sputum? (Especially look for bloody sputum that might be associated with TB, or yellowish sputum that might be associated with pneumonia).**
- **Is the cough accompanied by any fever or chills?**
- Is there a particular time of the day when the cough gets worse?
- Is there any pain associated with the cough (for example, chest-wall pain)?
- Does the patient experience any shortness of breath, especially when walking or doing other activities?
- Is there anything that the patient has noticed that triggers the cough (For example, exposure to dust, cold temperatures)?
- Is there anything that makes the cough better? (For example, taking medications/traditional medicines at home that help relieve his symptoms)

What other four important questions might you ask him as part of your assessment/history to gather critical information to guide your management plan? Give examples of the four questions you want to ask him.

Answers: (maximum possible score is 4)

- A. Knowledge and understanding of HIV infection. Given that the patient was only recently diagnosed, he will most likely need education regarding HIV infection and ART.**
- B. Perform a limited holistic assessment. Assess psychosocial issues that may impact his ability to carry out activities of daily living/ability to care for himself:**
- **cognitive level**
 - **overall health, home/environment factors**
 - **who else knows the diagnosis**
 - **acceptance of status**
 - **any other sick family members in the household**
- C. Document medication allergies/food allergies.**
- D. Document any medications/traditional medicines (herbal remedies) that the patient is currently taking at home.**

You find out the following information regarding the patient's history:

History of the present illness: The patient has not felt well for 8 months. He has lost weight, is always tired, and has night sweats that drench the bedclothes. Two weeks ago, he developed a cough productive of clear sputum. He complains of shortness of breath with activity. He denies orthopnea and is not breathless at night. He has no headaches. He feels pain when swallowing, and he complains of a white coating in his mouth. He denies substernal chest pain, pain on inspiration, and hemoptysis. He also denies abdominal discomfort, nausea, vomiting, diarrhea, dysuria, pelvic pain, and urethral discharge. He denies rashes and joint pain. He has felt "warm" at home, but has not taken his temperature; he denies shaking chills.

Past medical history: His past medical history is significant: a broken rib 3 years ago, depression, and migraines. He was diagnosed with AIDS 1 month ago, when he sought testing at an STI clinic because of his malaise. He was not surprised by his positive test. Follow-up testing was negative for antibodies to hepatitis A, B, and C, *Toxoplasma gondii*, and syphilis. A PPD was also negative. He takes ibuprofen whenever he finds it

necessary. He reports no medication allergies.

Social history: He separated from his wife two years ago. They are not in contact, and he does not know her HIV status, but suspects that she infected him. He did not have any other sexual partners during or since their marriage, and they did not use condoms. He drinks alcohol but does not use illicit drugs. He has smoked a pack of cigarettes per day since he was 18 years old.

- A) What information about the 5 vital signs will you gather at this point?
- B) What are the 4 most important physical examinations you will conduct on this patient?

Answers: (maximum possible score is 9)

A) Vital signs

1. **Blood pressure**
2. **Respirations**
3. **Pulse**
4. **Temperature**
5. **Weight**
6. Nasal flaring or other signs of respiratory distress
7. Signs of wasting

B) Assess the following on physical examination:

1. **Be sure to document his general appearance (weight, presence of fatigue)**
2. **Perform chest auscultation (listen for adventitious breath sounds, such as crackles or rattles)**
3. **Perform an oral exam with a light (check for ulcerations/lesions, presence of thrush, pallor in mucous membranes signifying anaemia, masses)**
4. **Check for generalized lymphadenopathy**
5. **Perform a brief skin exam checking for ulcerations, excoriations, rashes, signs of jaundice**

On physical examination, the following results are noted: He is a thin, uncomfortable-appearing man who is without respiratory distress at rest. His temperature is 38.0 °C, blood pressure 110/60, heart rate 88, respiratory rate 18, room air O₂ saturation 91%. His Head, Eyes, Ears, Nose, and Throat exam is notable for oral thrush. He has no photophobia or papilloedema. His neck is flexible. His lung exam reveals faint scattered bilateral crackles. His heart, abdominal, pelvic, and rectal exams

are normal. His skin exam is notable for excoriated nodules scattered over arms, legs, and trunk. His neurologic exam is normal.

Preliminary diagnoses:

1. What is the single most likely cause of his cough?
2. What are at least two other possible causes of his cough?
3. What is the most likely cause of his dysphagia?

Answers: (maximum possible score is 4)

- 1. The single most likely cause of his cough is Pulmonary Tuberculosis Disease in an HIV positive patient**
- 2. Two other possible causes of his cough include PCP and community-acquired pneumonia**
- 3. The most likely cause of his dysphagia is oral-esophageal candidiasis**

Given the past and present medical histories, what are the 2 most important laboratory investigations would you order for this patient?

Answers: (maximum possible score is 2)

- 1. Sputum for Ziehl-Neelsen staining (Acid Fast Bacilli) – sputum should be collected in the early morning on 3 consecutive days**
- 2. Chest radiography**
- 3. Nucleic acid amplification test (DNA PCR assays)**
4. Sputum or blood culture for AFB
5. Drug Susceptibility Test

Chest radiography showed a nodular infiltrate mostly in the upper lobes. There were cavities. Assuming that the patient has esophageal candidiasis and sputum examination is positive for Acid Fast Bacilli.

1. What is your diagnosis?
2. How would you classify this patient according to WHO staging? It is helpful to refer to the WHO staging chart provided.

Answer: (maximum possible score is 2)

- 1. Pulmonary Tuberculosis in an HIV infected patient**
- 2. WHO Stage IV**

Management: Now that the diagnosis of Pulmonary Tuberculosis in an HIV-infected patient and esophageal candidiasis has been made, **what 6 most important education messages on his medication or his understanding of medications would you focus on at this point?**

Answers: (maximum possible score is 6)

- 1. Assess if the patient understands the regimen of ordered medications, for example, route, dose, and frequency.**
- 2. Ensure that the patient understands what each medication is for.**
- 3. Ensure that there are no potential drug-drug interactions before the patient leaves the clinic.**
- 4. Ensure the patient knows if there are food requirements/limitations with any of the medications she is taking. Also address alcohol intake; encourage the patient to minimize alcohol intake or avoid it altogether while taking multiple medications.**
- 5. Ensure that patient is aware of potential side effects to report. Patients should report any onset of rashes that progressively get worse, worsening of symptoms in general, among others. (For example, Bactrim, which is used for prophylaxis, can rarely lead to Stevens Johnson syndrome, which is potentially life-threatening. Patients should be aware to report rashes, severe skin symptoms, severe fatigue, or other severe symptoms immediately).**
- 6. The patient should be told to return to the clinic for follow-up to make sure that her symptoms are improving.**

Should the patient start ART at this time? (Give the rationale for your decision)

Answers: (maximum possible score is 2)

1. **No**, the PTB and fungal infection should be treated first.
2. **It is generally recommended to stabilize any opportunistic infections before starting ART.**
3. Adherence assessment and education should then be done to prepare for initiation of ART. Explain to the patient that once these opportunistic infections have improved, he can eventually start taking ART to strengthen his immune system and help improve his HIV symptoms.
4. Cotrimoxazole for prophylaxis should be started in all HIV positive patients in Uganda irrespective of their CD4 status.

HIV Clinical Vignette 2 Complex: Tuberculosis Meningitis in HIV-Positive Patient

Chief complaint: A 48 year old HIV-positive woman (peasant farmer) who for the last 6 months has been under care of the HIV clinic, because of persistent productive cough, loss of body weight (25kg), and weakness, is now admitted to the inpatient ward with suspected encephalitis. She also complains of headache, fever, and neck stiffness since 4 days ago.

What are the 8 most important questions you might ask this patient about her symptoms and general health condition (the history of the presenting complaint)?

Answers: (maximum possible score is 8)

1. **Duration of headache, fever, neck stiffness, and cough**
2. **Inquire about patients' medical and social history including recent contact with patients with TB**
3. **Hemoptysis?**
4. **Shortness of breath/difficulty breathing (with or without exertion)?**
5. **Fevers/chills?**
6. **Night sweats?**
7. **Weight loss?**
8. Fatigue?
9. Orthopnea?
10. Recent travel?
11. Ill contacts?
12. Is she able to function normally, or is she too tired for work?

History of the presenting complaint:

She has not felt well for 6 months: she has lost weight, is always tired, and has night sweats that drench the bedclothes. Six months ago, she developed a cough productive of clear sputum. She is comfortable at rest, but has noticed progressive exertional dyspnea. She denies

orthopnea, and is not breathless at night. She feels her body is hot, but has not taken her temperature; she reports that she does not experience shaking chills.

Review of systems: She complains of an intermittent headache. She feels pain when she swallows, and has a white coating in her mouth. She denies photophobia, visual disturbances, and neck stiffness, as well as substernal chest pain, pain on inspiration, and hemoptysis. She also denies abdominal discomfort, nausea, vomiting, diarrhoea, dysuria, pelvic pain, and vaginal discharge. She denies rashes and joint pain.

List 10 other questions you would want to ask her in order to complete the history:

Answers: (maximum possible score is 10)

1. Any prior illnesses (OIs or other), hospitalizations, surgeries?
2. Has she disclosed her HIV diagnosis to anyone else?
3. Current medications?
4. Allergies?
5. What led her to get tested for HIV?
6. Any prior tests for HIV before the most recent?
7. Any other recent laboratory or study test results?
8. Pregnancy history?
9. How does she think she contracted HIV?
10. Any history of prior respiratory illnesses (TB, COPD, RAD, PNA, etc.)?
11. Any immunosuppression from any disease or drug therapy?
12. Last menstrual period?
13. Living situation: Does she have housing? Others at home?
14. Has she notified contacts that they are at risk for HIV disease?
15. Does she have children or a spouse/partner?
16. Social supports—family or friends in the community?
17. Is she sexually active? If so, does she use protection?
18. Substance use/chemical dependency: alcohol, tobacco, recreational drug use?
19. Access to health care: Does she have health insurance/covered by national health plan? If not, will she need financial assistance in order to receive medical care?
20. Previous BCG vaccination?
21. Recent contact with patients with Tuberculosis (TB)?
22. Any recent positive result on the purified protein derivative test?
23. Any tremor, abnormal movements, myoclonus and cerebellar dysfunction?

Past medical history: Her past medical history is significant: She was diagnosed with AIDS 7 months ago when she sought testing at an STD clinic because of her malaise. She was not surprised by her positive test. Follow-up testing was negative for antibodies to Hepatitis A, B, and C, Toxoplasma gondii, and Syphilis. A PPD was

positive. She is G3, P1, Sab2 (thrice pregnant, delivered one child, had 2 spontaneous abortions with the other pregnancies). She takes paracetamol whenever she finds it necessary. She reports no medication allergies.

Social history: She separated from her husband, who was physically abusive, 2 years ago. They are not in contact, and she does not know his HIV status, but suspects that he infected her. She did not have any other sexual partners during or since their marriage, and they did not use condoms because she had a tubal ligation after the birth of her daughter 19 years ago. She does not drink alcohol or use illicit drugs.

What are the 10 most important elements of the physical examination that need to be performed on this patient? (Note that vital signs can be considered part of the physical exam.)

Answers: (maximum possible score is 10)

1. Look for lymphadenopathy
2. Papilledema and tuberculoma during funduscopy
3. Vital signs: pulse, respiratory rate, temperature, weight (pulse oximetry if available)
4. **General appearance (tired? in respiratory distress? alert?)**
5. **Examination of oropharynx for ulcers, thrush, or other lesions**
6. **Examination of eyes: for jaundice, pallor suggestive of anemia, funduscopy to evaluate for papilledema or retinopathy, retinal tuberculoma, and tuberculomas**
7. **Evaluation of the neck for stiffness, lymphadenopathy, Jiro-Veci Pneumonia**
8. **Lung exam: auscultation for rattles, decreased breath sounds, or other abnormalities; percussion for dullness**
9. **Retractions or other evidence of respiratory distress?**
10. **Neurologic exam for any focal deficits, photophobia; mental status exam, neck flexibility, Kerning's sign, Oppenheim's sign**
11. **Abdominal exam for hepatosplenomegaly, tenderness to palpation**
12. **Extremities: edema? clubbing? cyanosis?**
13. **Skin examination for rashes or lesions?**
14. **Axillae examinations for lymphadenopathy?**
15. Cardiac exam for rhythm, rate, cardiomegaly
16. Pulse for rate, regularity, strength
17. Look for BCG vaccination scar
18. Pelvic examination
19. Breast examination
20. Rectal examination

Physical exam: She is thin, has neck stiffness, positive bilateral Kerning's sign,

positive right side Oppenheim's sign, dehydration, quiet vesicular sound, palpable left supraclavicular node, as well as inguinal nodes and dental decay. Her temperature is 38.0° C, blood pressure 110/60, heart rate 88, respiratory rate 18, room air O₂ saturation 91%. Her HEENT exam is notable for oral thrush. She has mild photophobia and papilledema. Lung exam reveals coarse bilateral upper lobe coarse crepitations. Heart, abdominal, pelvic, and rectal exams are normal. Skin exam is notable for excoriated nodules scattered over arms, legs, and trunk. On admission the patient was drowsy, with psychomotor agitation, without logical contact and with body temperature of 38.8°C. She scored 10 points on the Glasgow Coma Scale.

Fundus examination revealed a papilloedema, optic atrophy, and a small grayish white choroidal nodule. Cranial neuropathies involving Cervical Nerve VI causing focal deficit were noted.

Preliminary diagnoses:

- A. What are the 3 most likely causes of her headache, fever, neck stiffness, cough, and pain on swallowing?
- B. What are at least 2 other possible causes of her headache, fever, neck stiffness, and cough?

Answers: (maximum possible score is 5)

Preliminary diagnoses:

- A. The 3 most likely causes of her headache, fever, neck stiffness, cough, and pain on swallowing:

- 1. Tuberculosis Meningitis**
- 2. Pulmonary Tuberculosis**
- 3. Esophageal Candidiasis**

- B. Two other possible causes of her cough:

- 1. Bacterial Meningitis/ Meningococcal Meningitis**
- 2. Viral Meningitis**
- 3. Neoplastic: Metastatic Lymphoma**
- 4. Viral Encephalitis**
- 5. Aseptic Meningitis**
- 6. Haemophilus Meningitis**

What laboratory tests or imaging studies would you order? For the purposes of this exercise, you may assume that the results of blood chemistries, blood gases, antigen tests, hematologic studies, and plain films are available within 1 hour. Cultures and

other serologic tests can be ordered but will not return for a few days. CT and MRI are not available at this time.

List the five most important tests/studies you would want.

Answers: (maximum possible score is 5)

- 1. Gene X-pert for DNA PCR**
- 2. Lumbar puncture for Cerebrospinal fluid (CSF)**
- 3. Chest X-ray**
- 4. Complete Blood Count with differential**
- 5. Sputum for stain and culture (bacterial and AFB; PCP stain)**
6. Blood cultures (for bacteria and AFB)
7. CD4 count
8. HIV viral load
9. Computerized tomography (CT) scanning
10. Magnetic resonance imaging (MRI)
11. Metabolic panel/chemistry/renal and liver-function tests including serum and urine chemistry tests to measure blood urea nitrogen (BUN) and creatinine levels
- 12. Tuberculin skin testing to determine the risk of developing TB in the short term**

Labs/studies: Her laboratory tests revealed elevated inflammatory parameters (CRP- 35.9mg/l, ESR- 58/70, WBC- 10k), mild hyponatraemia (131mmol/l). CSF examination revealed polinuclear pleocytosis, elevated protein concentration, 47% polymorphonuclear leukocytes, and low glucose level. Sputum examination was positive for AFBs. The chest x-ray indicated multiple nodules, cavitations, and hilar lymphadenopathy. CT examination scan revealed only widening of the ventricles. Additionally on CSF culture elevated level of mycobacteria was found.

Final diagnosis:

What do you now think are the most likely causes of her headache, fever, neck stiffness, cough, and pain on swallowing?

Answers: (maximum possible score is 3)

- 1. Tuberculosis Meningitis**
- 2. Pulmonary Tuberculosis**
- 3. Esophageal Candidiasis**

Management: Now that it is confirmed that this HIV-positive patient has Tuberculosis Meningitis, Pulmonary Tuberculosis and Esophageal Candidiasis, what 4 major elements must you include in the management of this patient? Include any medications you might give, describe whether she should be admitted to the hospital or managed as an outpatient?

A) Would you initiate ART to this patient, if so when, and what ARVs must you avoid and why?

Answers: (maximum possible score is 4)

Management should include the following components:

1. Admit to hospital
2. Antituberculous treatment (Rifampicin 600mg/d, Pyrazinamid 1500/d, Nidrazid 300mg/d, Streptomycin 1.0/d)
3. Antioedematous drugs such as Mannitol 20% and glucocorticosteroids (Dexamethasone 16mg/daily in decreasing doses for the entire duration of hospitalisation)
4. Fluconazole for oral and esophageal candidiasis
5. Monitor course in hospital (for example with serial lung exams, pulse oximetry, CXR)
6. Initiate patient on cotrimoxazole prophylaxis
7. Nutritional support
8. Anti-pyretics for fever

TB/HIV co-Management: Now that it is confirmed that this HIV-positive patient has Tuberculosis Meningitis, Pulmonary Tuberculosis and Esophageal Candidiasis, would you initiate ART to this patient, if so when, and what ARVs must you avoid and why?

Answers: (maximum possible score is 2)

1. Manage patient on anti-TB and anti-fungal medications for a minimum of 2 weeks to stabilize her before starting her on ART
2. Avoid Nevirapine because it interacts with Rifampicin as they both cause hepatotoxicity. Rifampicin reduces blood levels of Nevirapine by 30-55%

HIV Clinical Vignette 3 Simple: HIV in Pregnancy

Chief complaint: A 28-year-old pregnant woman with a documented HIV-positive result, presents to the ante-natal clinic (ANC) for routine care. She reports no complaints.

As the primary healthcare worker who sees the patient first, what are some of the first 10 most important questions you might ask this patient about her HIV disease and general health in the recent past (the history of his present illness)?

Answers: (maximum possible score is 10)

- 1. Obstetric history [Last menstrual period (LMP), Gestational age (can be calculated in a woman with regular menses by counting weeks from LMP), Estimated date of delivery**
- 2. Number of pregnancies; complications and outcomes (gravida, para, abortion, living children); mode of deliveries**
- 3. History of genetic disorders**
- 4. Use of ARV prophylaxis during previous pregnancies**
- 5. HIV status of children**
- 6. Pregnancy: intended or not**
- 7. Contraceptive methods used, if any**
- 8. Signs or symptoms of maternal complications: elevated blood pressure, headache, significant edema, gastrointestinal or genitourinary symptoms, vaginal discharge or bleeding, decreased fetal movement (fetal movement is usually first detected at 18-24 weeks of pregnancy)**
- 9. Screen for depression**
- 10. Screen for intimate-partner violence**
- 11. Date of diagnosis of HIV disease**
- 12. Is she on ART? If yes ARV history, including regimen efficacy, toxicity, and ARV resistance**
- 13. Nadir CD4 and current CD4 cell count; HIV viral load**
- 14. Opportunistic infections and malignancies**
- 15. History of STDs**
- 16. Knowledge and understanding of HIV infection. Given that the patient was only recently diagnosed, she will most likely need education regarding HIV infection and ART**
- 17. Adherence**

You find out the following information regarding the patient's history:

She is in her third trimester

Past medical history: There was nothing remarkable

Social history: She is married with two children. She suspects she got infected with HIV five years ago before she got married. She does not drink alcohol, nor does she use illicit drugs.

What are the five vital signs/clinical information you will gather at this point?

Answers: (maximum possible score is 5)

- 1. Blood pressure, pulse rate, temperature, respiratory rate, and weight**
- 2. Fundoscopy, breast examination**
- 3. Pelvic examination, STD screening, examination for perineal or vaginal lesions (discoloration, condyloma, ulcerative lesions, vaginal discharge), cervical lesions, discharge or bleeding**
- 4. Fundal height, correlating with gestational age (concordant between 18 and 30 weeks)**
- 5. Fetal heart beat and rate: may be audible with Doppler devices as early as 12 weeks**
- 6. Fetal movements and position in third trimester**

On physical examination, the following results are noted: There is nothing remarkable on physical examination. Her heart, abdominal, pelvic, and rectal exams are normal.

What are the 4 most important laboratory investigations you would order for this HIV-positive pregnant woman without any complaints and without remarkable physical examination findings?

Answer: (maximum possible score is 4)

- 1. Blood for haemoglobin measurements**
- 2. Blood for syphilis testing**
- 3. Urine for protein and glucose testing**
- 4. Blood for CD4 and viral load testing**

Her haemoglobin was 11.6 mg /dl, syphilis test TPHA was negative, no protein and

glucose found in urine, and CD4 is 550 cells per microliter.

1. What is the diagnosis

Answer: (maximum possible score is 1)

HIV in pregnancy

In addition to a routine obstetric care, should this HIV-positive pregnant woman without any signs and symptoms of HIV/AIDS start ART at this time? (Give rationale for your decision)

Answer: (maximum possible score is 1)

Yes, it is generally recommended to start ART as soon as you get in contact with a pregnant HIV-positive woman to reduce the viral load and thus reduce the mother-to-child transmission of HIV.

What are the 10 most important education messages and management considerations you should deliver to this HIV-positive pregnant woman without any signs of HIV/AIDS?

Answer: (maximum possible score is 10)

- 1. Reinforce regularly and clearly the notion that, when the mother cares for herself, she is caring for her infant. Talk with the patient about stress, the importance of adequate mild-to-moderate exercise, and sufficient rest.**
- 2. Emphasize that regular prenatal care is extremely important to prevent complications of pregnancy.**
- 3. Use of a prenatal vitamin supplement is important, but cannot replace healthy food intake. Develop a plan with the patient for attaining the desired weight gain during pregnancy, while maintaining a healthy nutritional intake.**
- 4. Be sure the woman understands all planned procedures and treatments and understands their potential risks and benefits both to herself and to the fetus.**
- 5. Discuss the risks and benefits (to the woman and fetus) of each medication to be taken during pregnancy, including those for which there are limited data on teratogenicity.**
- 6. Discuss ART as a benefit to the woman's health and as part of the strategy to reduce the risk of perinatal HIV transmission to the fetus or newborn. Also discuss the effect of ART on reducing risk of HIV transmission to sex partners.**

7. Diligent use of "safer sex" during pregnancy is important for preventing infection with STDs and CMV, which can cause more complications when HIV is present. STDs can harm fetal development and may increase the risk of HIV transmission to the baby. For example new infections such as new genital herpes infections during pregnancy can cause severe complications and even death in neonates.
8. Teach her how to obtain medical attention quickly at the first signs of OI or other complication. Discuss what to watch for and how to get help when emergencies arise in the evenings or on weekends or holidays.
9. Help the patient clarify her child care options and support systems for raising a family.
10. The patient needs education and information about the risk of perinatal transmission of HIV, potential complications of pregnancy, initiation of ART, and the support she will need to optimize maternal and fetal outcomes.
11. Should receive thorough education and counseling about perinatal transmission risks, strategies to reduce those risks, and potential effects of HIV infection or HIV treatment on the course or outcomes of pregnancy.
12. Should receive evaluation and appropriate prophylaxis for opportunistic infections (OIs), as well as the vaccinations indicated for persons with HIV infection
13. Options for mode of delivery should be discussed early. The benefits and risks of vaginal vs. cesarean delivery
14. Screening for other potential maternal health problems, such as diabetes and hypertension
15. Maternal nutritional evaluation and support, including initiation of a prenatal multivitamin containing folate (0.4 mg PO QD) to reduce the risk of fetal neural tube defects; for women receiving trimethoprim-sulfamethoxazole, some experts recommend higher folate doses in the first trimester; consult with an HIV-experienced obstetric specialist.
16. Screening for psychiatric and neurologic disease
17. Intimate partner violence screening
18. Review of medications, including over-the-counter and nutritional agents, and discontinuation of medications with the potential for fetal harm
19. Institution of the standard measures for evaluation and management (e.g., assessment of reproductive and familial genetic history, screening for infectious diseases or sexually transmitted diseases [STDs])
20. Selection of effective and appropriate postpartum contraceptive methods, if desired
21. Cigarette, alcohol, and drug use contribute to poor maternal nutrition and can harm the developing fetus. Illicit drug use increases the risk of transmitting HIV to the infant. Injection drug use can transmit HBV, HCV, and CMV to the mother and to the baby.

Case: HIV Clinical Vignette 4 Complex: HIV and TB co-infection in Pregnancy
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Chief complaint: A 24-year-old woman, in her first trimester of pregnancy, presents to the antenatal clinic (ANC) complaining of cough and fever for 3 weeks. She is HIV-positive, which was diagnosed 2 weeks ago and she has not started ART.
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As the primary healthcare worker who sees the patient first, what are some of the first 10 most important issues you must discuss with this patient?

Answers: (maximum possible score is 10)

In pregnancy, the initial history should assess:

- 1. The status of the patient's HIV disease (for example CD4⁺ T-cell count, viral load)**
- 2. The need for beginning antiretroviral medication**
- 3. Ways to reduce perinatal transmission**
- 4. A careful review of the medical and surgical history, gynaecologic history, high-risk habits, and previous obstetric history should be done at the first prenatal visit**
- 5. Screening and diagnosis of TB in pregnant women living with HIV (MoH recommends using the four-symptom screen in people living with HIV, including pregnant women, namely: current cough, fever, night sweats, and unexplained weight loss or poor weight gain during pregnancy) - Ask the pregnant woman if she has been experiencing any of the above symptoms. This must be done at the pregnant women's first visit to MCH services and at every other visit to healthcare services, as the woman can develop TB at any time during her pregnancy. If these symptoms are being experienced, sputum should be collected and tested by X-pert MTB/RIF as initial test (if available) or smear microscopy for TB diagnosis. Positive or negative diagnostic test results may require repeat test or further testing with culture, drug susceptibility testing and further clinical investigation.**

What other four important questions might you ask him as part of your assessment/history to gather critical information to guide your management plan? Give examples of the four questions you want to ask him.

Answers: (maximum possible score is 4)

- 1. Knowledge and understanding of HIV infection. Given that the patient was only recently diagnosed, he will most likely need education regarding HIV infection and ART.**
- 2. Perform a limited holistic assessment. Assess psychosocial issues that may impact his ability to carry out activities of daily living/ability to care for himself:**
 - cognitive level**
 - overall health, home/environment factors**
 - who else knows the diagnosis**
 - acceptance of status**
 - any other sick family members in the household**

3. **Document medication allergies/food allergies.**
4. **Document any medications/traditional medicines (herbal remedies) that the patient is currently taking at home.**

You find out the following information regarding the patient's history:

On history, this is her first pregnancy; it was unplanned and occurred due to unprotected sexual intercourse. She has never used oral contraceptives nor has she practiced safe sex. This is her fourth partner this year. She complains that she has lost 5 kg in the past one month. During this time she has also had a persistent cough and evening fevers.

What are the 6 vital signs/clinical information details you will gather at this point?

Answers: Answer: (maximum possible score is 6)

1. **During pregnancy, a complete physical examination must be performed. Knowledge of the normal physiologic changes of pregnancy, such as an enlarged thyroid gland and a systolic murmur, is important to differentiate from disease process. HIV infection can affect essentially all body systems**
2. **Vital signs and weight**
3. **Funduscopy,**
4. **Breast examination**
5. **Pelvic examination, STD screening, examination for perineal or vaginal lesions (discoloration, condyloma, ulcerative lesions, vaginal discharge), cervical lesions, discharge or bleeding**
6. **Fundal height, correlating with gestational age**
7. **Fetal heart beat and rate: may be audible with Doppler devices as early as 12 weeks**
8. **Fetal movements and position in third trimester**

On physical examination, the following results are noted:

She is thin, but no signs of wasting. No lymphadenopathy. Crackles in the upper lobe of the left lung. No other significant findings

What is the diagnosis?

Answer: (maximum possible score is 1)

HIV and TB in pregnancy

Given the past and present medical histories, and assuming that the patient has Pulmonary Tuberculosis, what are the 3 most important investigations you would like to conduct?

Answer: (maximum possible score is 3)

- 1. Gene X-pert MTB/RIF should be used as the initial test for TB diagnosis in people living with HIV**
- 2. Microscopic examination of sputum for Acid-fast bacilli (AFB). Three samples of sputum should be submitted for smear. Staining for AFB is done using the Ziehl-Neelsen or fluorescent or Auramine-Rhodamine or the Kinyoun techniques**
- 3. Sputum for culture and drug-susceptibility testing**
4. Chest X-rays may assist in screening for TB in addition to symptom screening. However, chest X-rays should be used with caution in pregnant women because of the risk of radiation exposure to the foetus and are not recommended before 6 months of pregnancy
5. A baseline CD4 count. The test result is not required for ART initiation
6. A complete blood count including HB test for women beginning AZT-based ART at baseline and four weeks after initiating ART.

Labs/studies: Her WBC is 6, hematocrit 36%, and platelets 180,000. Her sputum smear microscopy is negative for AFBs but Gene Xpert MTB/RIF is positive for TB and RIF sensitive. CD4 cell count is 108 cells / mm³

What is the final diagnosis?

Answer: (maximum possible score is 1)

Pulmonary Tuberculosis in an HIV-positive pregnant woman

Given the diagnosis of Pulmonary Tuberculosis in an HIV-positive woman, should the patient start ART immediately? (Give the rationale for your decision)

Answers: (maximum possible score is 2)

No, not immediately, although it is generally recommended to start ART as soon as you get in contact with a pregnant HIV positive woman to reduce the viral load and thus reduce the mother-to-child transmission of HIV, this particular patient has TB which needs to be treated for at least 2 weeks before starting her on ART.

If you decide to defer initiation of ART to a later date, what specific information about ART initiation should you tell this woman

Answer: (maximum possible score is 1)

Explain to the patient that once these opportunistic infections have improved, she can eventually start taking ART to strengthen her immune system and help improve his HIV symptoms. Explain to her that ART will also reduce the viral load in her blood and thus reduce the chances of her transmitting HIV to her baby during pregnancy, delivery, and during breast feeding.

What immediate treatment would you provide for this patient? (Mention the medicines and not the doses and for each medicine mention its rationale.

Answers: (maximum possible score is 2)

- 1. Provide cotrimoxazole preventive therapy (CPT) to prevent opportunistic infections**
- 2. Anti-tuberculosis (rifampicin, Isoniazid, pyrazinamide, Ethambutol)**

Case: HIV Clinical Vignette 5 Simple: Herpes Zoster in HIV

Chief complaint: A 42-year-old known HIV-positive man reported to the HIV clinic complaining of painful ulcers in the mouth since three days ago.

What are the 5 most important questions you might ask this patient about his painful ulcers in the mouth and his general health in the recent past (the history of the presenting complaint)?

Answers: (maximum possible score is 5)

1. **Type of pain (mild, continuous, radiating in nature, sensations such as burning, tingling, itching, pricking, occurring along cutaneous distribution of dermatome)**
2. **Duration of pain (can present up to one month in advance of the acute mucocutaneous lesions)**
3. **Rash (characteristics progressing erythematous papules edema to vesicles and finally to pustules within one to seven days)**
4. **Do other members of the family have the same problem?**
5. **Are you taking any medication?**
6. **Is there any associated fever?**
7. **When does this pain occur? (When swallowing? When eating hot or cold food?)**
8. **Does the patient have problems chewing?**
9. **Does the patient have problems swallowing?**
10. **Is the patient able to eat food?**
11. **Is there a history of chicken pox infection during childhood?**
12. **Weight loss**
13. **Fatigue?**

History of the presenting complaint: He has not felt well for 5 months. He has lost weight. He has developed pain which is mild, continuous, and radiating in nature and is associated with fever of low grade over the last 7 days. After 3 days, the patient reports that he developed fluid-filled blisters dispersed over the left half of the face. The patient has not been able to eat food for 4 days. The patient gave history of chicken pox infection in childhood. No relevant drug, dental, and family history was reported.

What are the three most important elements of the physical examination that need to be performed on this HIV-positive man with painful ulcers in the mouth?

Answer: (maximum possible score is 3)

The three most important elements of the physical examination:

1. **Look in mouth for:** white patches — If yes, can they be removed?, ulcer - If yes, are they deep or extensive?, tooth cavities, loss of tooth substance, bleeding from gums, swelling of gums, gum bubble, pus, dark lumps
2. **Look at throat for:** white exudate, abscess, look for swelling over jaw, feel for enlarged lymph nodes in neck. If patient complains of tooth pain, does tapping or moving the tooth cause pain?
3. **Are they infected (red, tender, warm, purple, or crusts)?**
4. **Skin: any rashes or lesions?**
5. **Neurologic exam for any focal deficits, meningismus, photophobia; mental status**

Physical exam: On general physical examination, the patient had normal build and had no abnormality detected in the nails, gait, upper and lower limbs. Clinical signs of icterus, parlor, clubbing, edema, cyanosis, and lymphadenopathy were absent. On evaluation of vital signs, temperature was noted to be 37.8° C and blood pressure 140/80 mm of Hg. On extra-oral examination, no abnormality was detected in the eyes, nose, and tempo mandibular joint. Clusters of vesicles were present on the left half of face involving ala of the nose and upper lip. On intra-oral examination, multiple ulcers were seen on left half of hard palate and soft palate. The shape of the ulcers was irregular, and measured approximately 4 x 5 mm in size. Margins of the ulcer were erythematous and edges were slopped. They followed 1 dermatom on one side of the body.

Based on the history and clinical findings what is the **preliminary diagnoses?**

1. What is the single-most likely cause of the painful ulcer?
2. What are at least two other possible causes of his painful ulcer?

Answers: (maximum possible score is 3)

Single most likely cause of his painful ulcer:

1. **Herpes Zoster affecting the left side of face involving maxillary branch of the trigeminal nerve**

Two other possible causes of her painful ulcer:

1. **Herpes Simplex**
2. **Streptococcal infection**
3. **Drug reaction**
4. **Impetigo**

Mention 3 important laboratory tests or imaging studies you would order for this patient

Answers: (maximum possible score is 3)

1. **Tissue from the lesions for smear for cytological examination**
2. **Complete blood count including erythrocyte sedimentation rate**
3. **CD4 count test**
4. **Viral load**

Labs/studies: Complete blood count was found to be within normal limit except erythrocyte sedimentation rate and red blood cell which were slightly raised. The cytological examination was done after obtaining the smear from the lesions presented intraorally and extraorally. Acantholytic cells with few exfoliated squamous cells and inflammatory cells were reviewed in the cytological smear.

Final diagnosis:

1. What is the WHO HIV clinical stage of this patient?
2. What do you now think is the most likely cause of his painful mouth ulcers?

Answers: (maximum possible score is 2)

1. **WHO Clinical Stage 2**
2. **Herpes Zoster in HIV-positive patient**

Management: What 4 major elements would you include in managing this HIV-patient with herpes zoster in WHO Clinical Stage 2? Include any medications you might give, including dose and duration, and any further tests you may wish to order. Also describe whether he should be admitted to the hospital or managed as an outpatient.

Answers: (maximum possible score is 4)

1. Manage as outpatient
2. Manage in isolation to prevent the viral transmission to the healthy individuals
3. **The cutaneous lesions should be kept clean to reduce the risk of superinfection with bacteria**
4. **Analgesics should be prescribed for symptomatic relief of pain, such as Aceclofenac 500 mg thrice daily**
5. **Low dose Amitriptyline**
6. **Mouthwash such as betadine should be advised to improve oral hygiene**
7. **Antiviral drugs such as acyclovir 800 mg five times per day for ten days**
8. Review patient five to fourteen days
9. **Initiate patient on cotrimoxazole prophylaxis**
10. Counsel and prepare patient for ART

Case: HIV Clinical Vignette 6 Complex: Herpes Zoster ophthalmicus with Severe Uveitis , Chorioretinitis, and Post herpetic Neuralgia in an HIV-positive Patient

Chief complaint: A 29-year-old female HIV-positive patient reports to you complaining of very swollen red eyes, severe pain and multiple sores extending from the forehead to the right

orbital area and the nose. Early in 2010, she presented with history of smear positive Tuberculosis as well as chronic Diarrhea, oral sores, Hepatitis B infection and prolonged fever.

Considering the HIV status of the patient, as well as the clinical picture, what are the five most important questions you might ask this patient about her symptoms (the history of the presenting complaint)?

Answers: (maximum possible score is 5)

1. **Type of pain (mild, continuous, radiating in nature)**
2. **Duration of pain (can present up to one month in advance of the acute mucocutaneous lesions)**
3. **Rash (characteristics progressing erythematous papules edema to vesicles and finally to pustules within one to seven days.**
4. **Is there any associated fever?**
5. **Is the patient able to eat food?**
6. **Is there a history of chicken pox infection during childhood?**
7. **Weight loss**
8. **Fatigue?**
9. **Sensations such as burning, tingling, itching, pricking, occurring along cutaneous distribution of dermatome**

History of the presenting complaint: She has not felt well for 5 months: she has lost weight. She developed pain which is mild, continuous, and radiating in nature and is associated with fever of low grade since 7 days. After 3 days, the patient reports that she developed fluid-filled blisters distributed over left half of the face. The patient was not able to eat food since 4 days. The patient gave history of chicken pox infection in childhood. No relevant drug, dental, and family history was reported.

What are the eight most important elements of the physical examination that need to be performed on this patient? Also note that vital signs can be considered part of the physical exam).

Answer: (maximum possible score is 8)

Vital signs: pulse, respiratory rate, temperature, weight (pulse oximetry if available)

1. **General physical examination**
2. **Extra-oral examination**
3. **Intra-oral examination**

4. **Pulse rate**
5. **Respiratory rate**
6. **Temperature**
7. **Weight**

Physical exam: On general physical examination, the patient was normally built and no abnormality was detected in the nails, gait, upper and lower limbs. Clinical signs of icterus, parlor, clubbing, oedema, cyanosis, and lymphadenopathy were absent. On evaluation of vital signs, temperature was noted to be 37.8°C and blood pressure 140/80 mm of Hg. On extra-oral examination, no abnormality was detected in the eyes, nose, and tempo mandibular joint. Clusters of vesicles were present on the left half of face involving ala of the nose and upper lip. On intra-oral examination, multiple ulcers were seen on left half of hard palate and soft palate. The shape of the ulcers was irregular, and measured approximately 4 x 5 mm in size. Margins of the ulcer were erythematous and edges were slopped.

Based on the history and clinical findings what are the preliminary diagnoses?

- A. What is the single-most likely cause of the swollen red eyes, severe pain and multiple sores extending from the forehead to the right orbital area and the nose?
- B. What are at least two other possible causes of the swollen red eyes, severe pain and multiple sores extending from the forehead to the right orbital area and the nose?

A. Answers: (maximum possible score is 1)

Herpes Zoster ophthalmicus

B. Answers: (maximum possible score is 2)

1. **Complete blood count and erythrocyte sedimentation rate**
2. **Cytological examination of the intraorally and extraorally lesions for a smear from the lesions presented**

What laboratory tests or imaging studies would you order for this patient?

Answer (maximum possible score is 2)

1. **Complete blood count**

2. Cytological examination

Labs/studies: Complete blood count was found to be within normal limit except erythrocyte sedimentation rate and red blood cell which were slightly raised. The cytological examination was done after obtaining the smear from the lesions presented intraorally and extraorally. Acantholytic cells with few exfoliated squamous cells and inflammatory cells were reviewed in the cytological smear.

Final diagnosis:

What do you now think is the most likely cause of her very swollen red eyes, severe pain and multiple sores extending from the forehead to the right orbital area and the nose?

Answer: (maximum possible score is 1)

Herpes Zoster in HIV positive

Management: Mention 6 critical elements in the management of this patient? Include any medications you might give, including dose and duration, and any further tests you may wish to order. Also describe whether she should be admitted to the hospital or managed as an outpatient.

Answers: (maximum possible score is 6)

1. **Manage as outpatient**
2. **Manage in isolation to prevent the viral transmission to the healthy individuals**
3. **The cutaneous lesions should be kept clean to reduce the risk of superinfection with bacteria**
4. **Analgesics should be prescribed for symptomatic relief of pain, such as Aceclofenac 500 mg thrice daily**
5. **Mouthwash should be advised to improve oral hygiene such as betadine mouthwash**
6. **Antiviral drugs such as acyclovir 800 mg five times per day for ten day**
7. **Amitriptyline**
8. **Review patient 5 to 14 days**

On review: The patient gradually improved and continued treatment as an outpatient. However, a month later, the patient came complaining of continuous headache, painful

right eye, and persistent tears from the same eye.

What is your most likely diagnosis?

Answer: (maximum possible score is 2)

1. Severe uveitis
2. Chorioretinitis

Examination: How would you confirm your suspicion?

Answer: (maximum possible score is 1)

1. **Eye examination (slit lamp and fundoscopy)**

Findings: In the subsequent visits, the patient complained of pains of the affected area, what is your diagnosis?

Answer: (maximum possible score is 1)

Post-herpetic neuralgia

What complications can occur in the course of herpes zoster ophthalmicus? Mention 4

Answer: (maximum possible score is 4)

1. **Corneal neovascularization and scarring resulting in poor vision**
2. **Neurotrophic ulcer with perforation**
3. **Secondary bacterial or fungal infection**
4. **Secondary glaucoma from uveitis or steroid treatment**
5. **Necrotizing interstitial keratitis**
6. **Post-herpetic neuralgia**
7. **Vision loss from optic neuritis or chorioretinitis**
8. **Corneal neovascularization and scarring resulting in poor vision**
9. **Neurotrophic ulcer with perforation**
10. **Secondary bacterial or fungal infection**
11. **Secondary glaucoma from uveitis or steroid treatment**
12. **Necrotizing interstitial keratitis**
13. **Post-herpetic neuralgia**
14. **Vision loss from optic neuritis or chorioretinitis**

Case: HIV Clinical Vignette 7 Simple: Cryptococcal Meningitis in HIV

Chief complaint: A 48-year-old HIV-positive man presents at your HIV clinic with a 2-

day history of fever, headache and vomiting.

What are the 5 most important questions you might ask this patient about his symptoms (the history of the presenting complaint)?

Answers: (maximum possible score is 5)

- 1. Duration of fever, headache, and vomiting**
- 2. Stiff neck?**
- 3. Photophobia (sensitivity to light)?**
- 4. Altered mental status (confusion)?**
- 5. Cough?**
- 6. Cutaneous infections?**
- 7. Is the cough productive?**
- 8. Weight loss?**
- 9. Fatigue?**
- 10. Cranial neuropathies?**
- 11. Alteration of consciousness?**
- 12. Lethargy?**
- 13. Meningeal irritation?**

He has no previous history of any chronic medical conditions or any drug allergies. He claims to have been in perfect health prior to the onset of these symptoms.

What are the 6 most important elements of the physical examination that need to be performed on this patient? Also note that vital signs can be considered part of the physical exam.

Answers: (maximum possible score is 6)

- 1. Look at the patient's neurological condition, is the patient lethargic? Confused? Agitated?**
- 2. Count the breath in one minute**
- 3. Check if able to drink**
- 4. Feel for stiff neck**
- 5. Check if able to walk unaided**
- 6. General appearance**
- 7. Temperature**
- 8. Mental status**
- 9. Skin examination - skin rash?**

Physical exam: revealed a reasonably well-nourished man, Febrile at 38 degrees C with reduced consciousness and signs of meningism. He had numerous skin coloured vesicles on the face and upper limbs, as well as a few lesions scattered on the lower limbs.

Preliminary diagnoses:

1. What is the single most likely cause of these symptoms?
2. What is the other likely cause of these symptoms?

Answers: (maximum possible score is 2)

1. Cryptococcal meningitis
2. Molluscum contagiosum

Laboratory tests or imaging studies

List the five most important tests/studies you would want

Answer: (maximum possible score is 5)

1. Complete blood count
2. Hepatic function test
3. Renal function test
4. Computerized tomography of the brain
5. Cerebral spinal fluid (India ink stain and culture)
6. Histology from a skin biopsy
7. Hepatitis BsAg
8. Hepatitis C
9. Mantoux
10. VDRL
11. CD4 cell count

Labs/studies: His CBC showed haemoglobin 2.8g/dL, platelet count of 177×10^9 . Hepatic and renal function and CT brain scan were all normal. CSF revealed an elevated opening pressure with a positive India ink stain showing the typical “halo” appearance. CSF culture was also positive for Cryptococcus Neoformans. The histology from the skin biopsy showed encapsulated spores in the upper dermis. No granulomas or histiocytic giant cells were seen. CD4 count is 102 cells/mm³.

Final diagnosis:

What do you now think is the most likely cause of her symptoms?

Answer: (maximum possible score is 1)

Cryptococcal Meningitis in an HIV-positive patient

Management:

1. How would you manage this patient? Include any medications you might give, including dose and duration, and any further tests you may wish to order.
2. Also describe whether she should be admitted to the hospital or managed as an outpatient.
3. Would you start ART in this patient now, and why?

Answers: (maximum possible score is 4)

1. **Intravenous amphotericin B (0.7 -1 mg/kg/d) plus flucytosine (100 mg/kg/d) for 6-10 weeks. Or 2. Intravenous amphotericin B (0.7 -1 mg/kg/d) plus flucytosine (100 mg/kg/d) for 2 weeks, followed by fluconazole at 400 mg/kg/d for a minimum of 10 weeks**
2. **Admit to hospital**
3. **ART should be started after a minimum of 2 weeks of antifungal treatment to stabilize the patient thereby preventing immune reconstitution syndrome**

Case: HIV Clinical Vignette 8 Complex: Cryptococcal Meningitis and Pulmonary Tuberculosis in an HIV positive patient

Chief complaint: A 46-year old female patient was diagnosed with HIV-1 infection 7 years ago and was put on antiretroviral therapy (ART) consisting of zidovudine (300 mg twice a day, lamuvidine 150mg twice a day, and nevirapine 200mg twice a day. She discontinued ART one year ago. She presented to the emergency medicine department of our hospital with a history of fever, since 3 months, and progressive breathlessness since 10 days. On examination, she was febrile and tachypnoeic. Chest auscultation revealed bilateral basal crepetations. Patient also had oral thrush. Laboratory investigations showed hemoglobin 10.2 g/dL, total leukocyte count 2,500 mm³ and platelet count 100,000 mm³. Arterial blood gas analysis revealed pH 7.461, carbon-dioxide tension 25.7 mm Hg, arterial oxygen tension 49.2 mm Hg, bicarbonate 17.9 meq/L and oxygen saturation was negative 82.6%. Chest radiograph

was normal. Sputum examination was negative for *Pneumocystis jiroveci* and acid-fast bacilli. Mantoux test was also negative. Her CD4 was 57 cells/mm³ and HIV ribonucleic acid (RNA) viral load was 750,000 copies/mL. Blood cultures (Bac TAlert, biomérieux, France) were sterile initially after 5 days incubation but were further incubated to look for the growth of opportunistic organisms.

Based on these findings, what two important questions would you like to know about her illness?

Answers: (maximum possible score is 2)

- 1. Is she on cotrimoxazole prophylaxis?**
- 2. Is she able to function normally, or is she too tired for work?**

History of the presenting complaint: She is not on co-trimoxazole and has easy fatigability. In view these findings together with the fever, tachypnea, bilateral crepitations in the lungs and Type 1 respiratory failure.

- 1. What is your preliminary diagnosis?**

Answer: (maximum possible score is 1)

1. *Pneumocystis jiroveci* infection

With a possibility of *Pneumocystis jiroveci* infection suspected, what treatment would you prescribe for her empirically? (mention only the drugs and supportive treatment without doses)

Answer: (maximum possible score is 3)

- 1. Oxygen inhalation,**
- 2. High dose Co-trimoxazole.**
- 3. Fluconazole**

She was started on oxygen inhalation, co-trimoxazole. ART with zidovudine, lamivudine and nevirapine was restarted along with fluconazole. She was discharged in a stable condition after a hospital stay of 15 days. However, after 10 days she has come back and she has been admitted to your ward with complaints of fever, severe headache and vomiting for 3 days.

What are the 5 most important questions you might ask this patient about her new symptoms

(the history of the presenting complaint)?

Answer: (maximum possible score is 5)

1. Neck pain?
2. Blurred vision?
3. Fear of light?
4. Fever?
5. Body pains?

She reports severe neck pain, blurred vision, photophobia, feeling hot, and severe body pain.

What are the eight most important elements of the physical examination:

Answers: (maximum possible score is 8)

1. **Vital signs: pulse, respiratory rate, temperature, weight (pulse oximetry if available)**
2. **General appearance (tired? in respiratory distress? alert?)**
3. **Examination of oropharynx for ulcers, thrush, or other lesions**
4. **Examination of eyes: for jaundice, pallor suggestive of anemia, fundoscopy to evaluate for papilledema or retinopathy; photophobia**
5. **Evaluation of the neck for stiffness, lymphadenopathy**
6. **Lung exam: auscultation for rattles, decreased breath sounds, or other abnormalities; percussion for dullness**
7. Cardiac exam for rhythm, rate, cardiomegaly
8. Pulse for rate, regularity, strength
9. **Neurologic exam for any focal deficits, meningismus, photophobia; mental status exam**
10. **Abdominal exam for hepatosplenomegaly, tenderness to palpation**
11. **Extremities: edema? clubbing? cyanosis?**
12. **Skin: any rashes or lesions?**
13. **Axillae: lymphadenopathy?**

Physical exam: She is a thin, uncomfortable-appearing woman who is without respiratory distress at rest. Her temperature is 38.0°C, blood pressure 110/60, heart rate 88, respiratory rate 18, room air O₂ saturation 91%. Her HEENT exam is notable for oral thrush. She is without photophobia or papilledema. Her neck is supple. Lung exam reveals faint scattered bilateral crackles. Her heart, abdominal, pelvic, and rectal exams are normal. Her skin exam is notable for excoriated nodules scattered over arms, legs, and trunk. A detailed neurologic exam is entirely normal.

Preliminary diagnoses:

1. What is the single most likely cause of her severe headache, vomiting, neck pain, blurred vision, fever and body pains?
2. What are at least two other possible causes of her severe headache, vomiting,

neck pain, blurred vision, fever and body pains signs?

Answer: (maximum possible score is 1)

The single most likely cause of her severe headache, vomiting, neck pain, blurred vision, fever and body pains is

- **Cryptococcal meningitis (relapse or Immune Reconstitution Inflammatory Syndrome)**

The two other possible causes of her severe headache, vomiting, neck pain, blurred vision, fever and body pains: **Answers: (maximum possible score is 2)**

- **Pneumocystis pneumonia (PCP)**
- **Viral pneumonia**
- **Bacterial pneumonia or “community-acquired pneumonia”**
- **COPD/chronic bronchitis**

What laboratory tests or imaging studies would you order? For the purposes of this exercise, you may assume that the results of blood chemistries, blood gases, antigen tests, hematologic studies, and plain films are available within 1 hour. Cultures and other serologic tests can be ordered but will not return for a few days. CT and MRI are not available at this time.

List the five most important tests/studies you would want.

Answers: (maximum possible score is 5)

1. **Chest X-Ray,**
2. **CSF analysis**
3. **CD4 count**
4. **Bronchoalveolar lavage for cryptococcal organisms**
5. **Serum cryptococcal polysaccharide antigen (sCRAG)**
6. **Computerized Tomography for masses of the brain**
7. **Magnetic Resonance Imaging Test**
8. **Lumbar puncture for the organism on India ink staining for CNS involvement**
9. **CBC with differential**
10. **Metabolic panel/chemistry- renal and liver-function tests**
11. **Sputum for stain and culture (bacterial and AFB; PCP stain, if available)**
12. **Serum LDH, if available**
13. **Blood cultures (for bacteria and AFB)**
14. **HIV viral load**

Labs/studies: Her WBC is 6, hematocrit 36%, and platelets 180,000. Electrolytes, BUN, creatinine, liver enzymes, alkaline phosphatase, and total bilirubin are within normal limits. A urinalysis is normal, and two sets of blood cultures are sent. PA and lateral chest radiography shows bilateral hazy infiltrates in a ground-glass pattern. An arterial blood gas comes back at 62mmHg. Chest X Ray showed patchy consolidation of right middle lobe and CD4 counts were 361 cells. Sputum sample for AFB staining was collected and FNAC of cervical lymph nodes were also carried out.

Provisional diagnosis:

What do you now think is the most likely cause of her severe headache, vomiting, neck pain, blurred vision, fever, and body pains?

Answer: (maximum possible score is 1)

Tuberculosis meningitis in HIV infected person

An empirical therapy category 1 antituberculosis therapy (Rifampicin, Isoniazid, Ethambutol and Pyrazinamide) for suspected tubercular meningitis was started. On day two of admission, CSF analysis report came where Indian ink stain was positive and budding encapsulated yeast were seen showing the presence of Cryptococcus species. Sputum AFB test turned out negative and by FNAC report tubercular lymphadenopathy was confirmed.

- 1. What is your final diagnosis?**
- 2. How would you manage this patient?**

How would you manage this patient? Include any medications you might give, including dose and duration, and any further tests you may wish to order. Also describe whether she should be discharged and managed as an outpatient or continue inpatient management.

Answers: (maximum possible score is 3)

- 1. Final diagnosis is cryptococcal meningitis and pulmonary tuberculosis in an HIV positive patient**

2. Management should include the following components:

- **Continue with category 1 Anti-TB Treatment**
- **Intravenous Amphotericin B 30 mg and oral Fluconazole 1200 mg OD should started for treatment of Cryptococcal meningitis**

On the 9th day of admission patients hepatic function worsened (SGPT 173.2 IU/ml).

What do you think caused this?

Answer: (maximum possible score is 1)

Suspect high dose of Fluconazole and therefore Fluconazole should be stopped and resumed two days later at a reduced dose of 400 mg OD

On the 15th day of admission, lumbar puncture and CSF analysis were done and in CSF analysis few encapsulated yeasts were seen.

How would manage this patient? (please include the medicine doses and indicate if you would continue managing the patient as an inpatient)

Answer: (maximum possible score is 2.8)

1. The patient should be discharged after 14 days as the course of Intravenous Venous Amphotericin is over and the patient was stable.
2. **The patient should be given Fluconazole 400 mg OD for 8 weeks and further low dose 150 mg OD as prophylaxis.**
3. **Category 1 Anti-TB Treatment should also be continued**