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Multi-level experiences and determinants of alcohol misuse and illicit drug use among occupational groups at high-risk of HIV in sub-Saharan Africa: A thematic synthesis of qualitative findings

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ABSTRACT

Occupational groups at high-risk of HIV in sub-Saharan Africa (SSA) may be at increased risk of substance use because of occupation-related factors. We synthesised qualitative data on determinants and context of alcohol misuse and illicit drug use in these groups. We systematically searched five databases for qualitative studies reporting on alcohol misuse or illicit drug use in fisherfolk, uniformed personnel, miners, truckers, motorcycle taxi riders, and sex workers in SSA. Qualitative data and interpretations were extracted and synthesised using a systematic iterative process to capture themes and overarching concepts. We searched for papers published prior to January 2018. We identified 5692 papers, and included 21 papers in our review, published from 1993 to 2017. Most studies were conducted among fisherfolk ($n=4$) or sex workers ($n=12$). Ten papers reported on alcohol use alone, three on illicit drug use alone and eight on both. Substance use was commonly examined in the context of work and risky behaviour, key drivers identified included transactional sex, availability of disposable income, poverty, gender inequalities and work/living environments. Substance use was linked to risky behaviour and reduced perceived susceptibility to HIV. Our review underscores the importance of multilevel, integrated HIV prevention and harm reduction interventions in these settings.

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KEYWORDS

Fisherfolk; truckers; HIV; substance use

Background

Alcohol misuse and illicit drug use are major global health concerns, linked to infectious and non-infectious diseases, with a large social and economic burden born by individuals, families and society at large (United National Office on Drugs and Crime, 2018; World Health Organisation, 2018). Alcohol and illicit drug use may directly or indirectly facilitate HIV transmission through increased likelihood of risky sexual behaviour (Pandrea, Happel, Amedee, Bagby, & Nelson, 2010; Santos et al., 2013; Woldu et al., 2019), increased HIV shedding and increased inflammation at mucosal sites

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(Pandrea et al., 2010). Among people living with HIV, alcohol and illicit drug use may have negative effects on disease progression through several mechanisms including reduced uptake of HIV prevention and care services (Hendershot, Stoner, Pantalone, & Simoni, 2009) and through impacts on viral replication, host immunity and treatment compliance and efficacy (Hill et al., 2018; Pandrea et al., 2010) with implications not only for high-risk occupational groups but also for the wider general population with whom they may share sexual networks.

In a recent systematic review we showed that alcohol misuses and illicit drug use is common among occupational groups at high-risk of HIV in SSA (e.g. including sex workers (Baral et al., 2012), fisherfolk (Kissling et al., 2005; Kiwanuka et al., 2014; Kiwanuka et al., 2017; Kwena et al., 2019; Smolak, 2014), uniformed personnel (Azuonwu, Erhabor, & Obire, 2012), miners (Baltazar et al., 2015), motorcycle riders (Lindan et al., 2015), and truckers (Delany-Moretlwe et al., 2014)). The highest levels of substance use were recorded among sex workers and uniformed personnel (Kuteesa et al., 2019). A small number of studies in this review examined the association between alcohol use and HIV infection in SSA (Fisher, Bang, & Kapiga, 2007; Pithey & Parry, 2009). However, the review focused on quantitative outcomes of substance use and did not provide information on contextual determinants. To address this gap, we undertook a synthesis of multiple qualitative studies to document the individual and contextual factors that shape substance use in high-risk occupational sub-populations, aiming to collate data across different contexts, identify research gaps, and assess evidence for the development, implementation and evaluation of substance use reduction interventions.

Our hypothesis is that occupation-related factors common to these groups might predict alcohol misuse and illicit drug use and other high-risk behaviour. Our theoretical framework draws upon the social ecological perspective (Scribner, Theall, Simonsen, & Robinson, 2010) to illustrate pathways through which social norms, work and work-related hazards including prolonged working hours, stigma e.g. from sex work, and prolonged separation from family might heighten an individual's risk of substance use, and HIV (Figure 1). The socioecological framework has been used to demonstrate multi-level influences on sexual risk behaviour and an elevated HIV burden among key population groups (Sileo, Kintu, Chanes-Mora, & Kiene, 2016). We do not assume that homogeneity exists across key population groups. The broad categories of sex workers, miners, truckers, motorcycle riders, uniformed personnel and fishing communities, consist of individuals with differential access to and experience of substance use. However, we presume they share common multi-level, work-related factors that may predispose them to increased substance use.

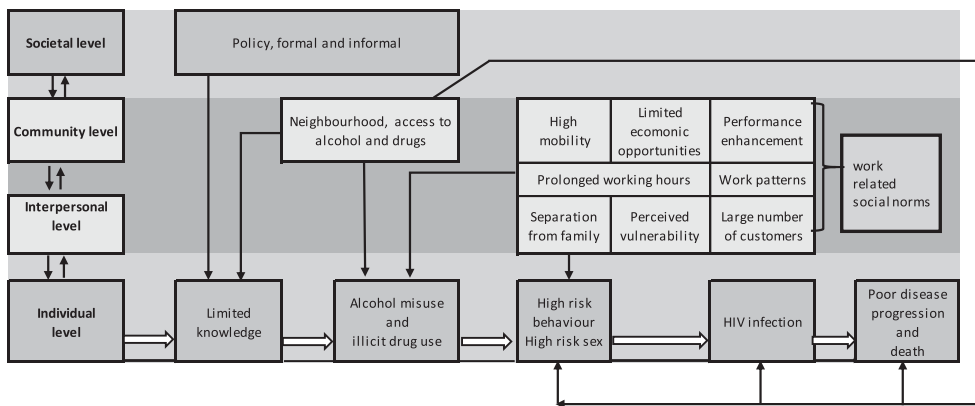


Figure 1. Social ecological model framework for the role of occupation-related factors in alcohol misuse and illicit drug use among groups at high-risk of HIV/AIDS.

Methods

Search strategy

This qualitative data synthesis was conducted as part of a systematic review following Cochrane (Higgins & Green, 2011) and PRISMA reporting guidelines ('Preferred Reporting Items for Systematic Reviews and Meta-Analyses., 2015'). The review protocol was registered with PROSPERO (registration number CRD42016053495). The synthesis of quantitative papers has been published separately (Kuteesa et al., 2019).

We used a fourfold literature search strategy to identify studies on alcohol use, and illicit drug use among select high-risk occupational groups, specifically fisherfolk, uniformed personnel, miners, truckers, motorcycle taxi riders, and sex workers in SSA. First, we searched five online bibliographic data bases: Medline, Embase, Global health, Web of Science, PsycINFO, for peer-reviewed papers published prior to 16th January 2018, with no language restrictions, using single and combined search terms for alcohol, illicit drug use among high-risk occupational groups in SSA [supplemental material Tables 1 and 2]. We used broad search terms and, to ensure good coverage of all relevant literature, we did not include any search terms specifically related to qualitative data. Second, we examined reference lists of retrieved articles for potentially relevant articles based on titles and abstracts; third, we reviewed scientific conference presentations and technical organisational reports such as global state of harm reduction reports. Fourth, we contacted authors for relevant published and unpublished data.

Inclusion and exclusion criteria

Two reviewers independently reviewed each paper for inclusion in the synthesis. We read the papers several times to familiarise ourselves with the data. We assessed papers for inclusion and exclusion using *a priori* eligibility criteria. Specifically, we included peer reviewed papers from occupational groups in SSA at high-risk of HIV including fishing communities, uniformed personnel, truckers, miners, sex workers, and motorcycle taxi riders reporting qualitative data that pertained to experiences, risk factors, and context of alcohol misuse or illicit drug use. For purposes of this work, we used Creswell's definition of qualitative research:

Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting. (Cresswell, 1998, p. 15)

We excluded papers that did not clearly identify the population or did not provide separate results for high-risk occupational groups, or that reported data from the same study participants as another included paper (with equivalent or less information included) (Figure 2).

Data extraction, synthesis and quality assessment

To add to the validity and transparency of the review process, we discussed our individual assessments in detail and agreed on how to resolve discrepancies about which studies to include, as they arose. We logged and recorded all decisions.

The first author took the lead in carrying out the analysis and discussed the analysis in detail at each stage with the second author. Included papers were imported into QSR International's NVivo 12 program. We extracted textual data that represented study objectives, sample, participants' social demographic characteristics, data collection methods, authors' findings and interpretations as well as verbatim data from study participants (Noblit, Hare, & Hare, 1988). These provided the context for interpretation and explanation for each study. We conducted a qualitative text analysis on findings in the individual articles (Hennink, Hutter, & Bailey, 2010).

Data synthesis followed the framework outlined by Whitemore and Knafl (Whitemore & Knafl, 2005): data reduction; data display; data comparison; conclusion drawing; and verification. Four

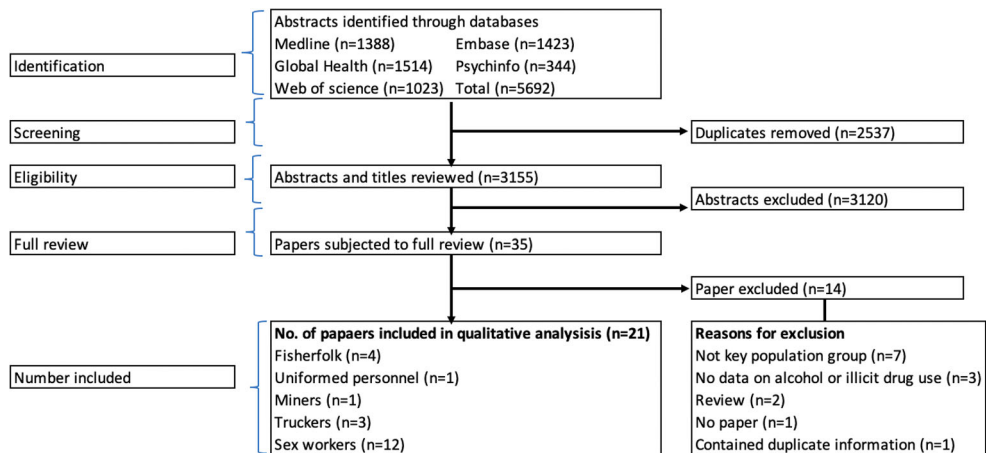


Figure 2. Data extraction flow chart.

researchers coded a subset of the data in parallel to establish a coding framework. Coding was based on original data cited in papers as ‘participant understanding’ or ‘author interpretation’. Each team member drafted first-level codes that were organised initially around the review question. Differences in interpretation of codes were discussed at team meetings until consensus was reached. One main code tree that formed the basis for further coding was developed. Through an iterative process, we continuously adapted the coding tree based on emerging findings. Coding was cyclical and the coding scheme evolved during data analysis to allow deeper understanding and reflection to emerge (Weston et al., 2001). There was not consistent coding across all papers since the schedule evolved over time and the final version was not applied to all. To ensure credibility of the findings, the coding team used group consensus to examine codes and to determine if they were in opposition to each other, directly comparable or related. Within the team we condensed the coding list and finalised the coding schedule.

The emerging analysis was discussed among the coding team continuously. Data were categorised under specific subthemes. Primary themes or first-order constructs reflected participants’ views and understanding as reported in included studies whereas secondary themes/secondary order constructs were authors’ interpretations of study findings. We created a preliminary matrix to display subthemes and concepts within each study under broad headings that reflected the purpose of the synthesis. We clustered related sub-themes together to form themes and used conceptual maps to summarise the data (Novak, 1990). Themes became increasingly refined through reciprocal translation, that is, the translation of studies into one another by comparing the themes and concepts in one account with those in others (Braun & Clarke, 2006). We achieved data saturation when we could not identify new themes and when we had achieved a coherent understanding of the emergent themes whilst preserving nuances in the data. Data was conceptualised under the important or recurrent themes presented in the findings.

We assessed the quality of individual studies using a checklist based on common elements from existing criteria (Critical Appraisal Skills Programme, 2002; Mays & Pope, 2000; Pope, Mays, & Popay, 2006; Tong, Sainsbury, & Craig, 2007). The assessment criteria included meeting the criteria of being a ‘qualitative study’, clarity of research questions; adequacy of reporting detail on the qualitative approach, study context, researchers’ role, sampling strategy, data collection and analysis; appropriateness of the research question, sampling strategy, data collection and analysis methods; and that the claims made were supported by sufficient evidence, Table 2. Three independent reviewers assessed study quality and resolved differences by group consensus.

Results

Description of papers

The search yielded 3155 non-duplicate papers. Following screening, we excluded 3120 papers which did not meet the eligibility criteria leaving 35 publications including one thesis. Of the 35 publications, we then excluded 14 papers because of lack of qualitative data on the topic ($n = 1$); no paper ($n = 1$); review ($n = 2$); no data on alcohol or illicit drug use ($n = 3$); not key population group ($n = 7$) (Figure 2). We excluded the thesis because adequate information was contained in a paper by the same author (Sileo et al., 2016). We finally included 21 papers published between 1993 and 2017 in our data synthesis (Figure 2). Most studies used qualitative descriptive methods, two used mixed methods. Sources of qualitative data included mapping, observation, in-depth interviews, key informant interviews, focus group discussions, and ethnography (Table 1).

From the synthesis, we generated nine primary themes (identified from participants' understanding) and secondary themes (identified from authors' interpretation) (Supplementary Table 3). Some of which are described using direct quotes. We found a range of multi-level occupation-related drivers of substance use (Supplementary Table 4). Most studies met the methodological quality criteria, with a few exceptions (Table 2). No studies were excluded or accorded less importance based on quality because interpretations of what constitutes 'quality' in terms of methods in qualitative research, and the role of quality criteria and their application to systematic reviews remains an area of debate and evolution, reflecting different epistemological perspectives (Carroll & Booth, 2015; Dixon-Woods et al., 2007; Dixon-Woods, Shaw, Agarwal, & Smith, 2004; Walsh & Downe, 2006; Welch & Piekkari, 2017).

Description of themes

Substances used

Ten papers reported on alcohol use alone, three only on illicit drug use and eight on both. Studies by Mbonye et al. (Mbonye et al., 2012a) and Needle et al. (Needle et al., 2008) reported that sometimes alcohol and illicit drugs were used in combination. Commonly reported illicit drugs included heroin, cocaine, marijuana/cannabis, local synthetic drugs, and cannabis. Substance use was commonly examined in the context of risky behaviour, with substances used mainly as stimulants or disinhibiting agents for sex. Some occupational groups such as sex workers switched between alcohol and different types of illicit drugs according to availability, cost and to achieve different effects i.e. stimulation and disinhibition as 'uppers' and 'downers' (Needle et al., 2008). Studies described conflicting impact/effect of alcohol and illicit drug use. On the one hand, alcohol and illicit drug use was an enjoyable experience, and was not associated with significant self-perceived harm (Lubega et al., 2015; Nwokoji & Ajuwon, 2004; Parry, Petersen, Carney, Dewing, & Needle, 2008; Sileo et al., 2016). On the other hand, some papers reported perceived alcohol and illicit drug-related harms including impaired judgement (Erinosho, Isiugo-Abanihe, Joseph, & Dike, 2012; Mbonye et al., 2012a), vulnerability to sexually transmitted infections (Izugbara, 2005), and social harms such as violence, stigma and discrimination and social exclusion (Izugbara, 2005; Parry et al., 2009) (Supplementary Table 4).

Organisation of working environments

Work environments for truckers, fisherfolk, sex workers, miners and uniformed personnel were often in geographically remote locations and required separation from family for extended periods of time. For instance, papers on migrant miners and uniformed personnel populations described that because they lived away from their families, they felt they could behave differently, and engage in substance use.

... If their families are around, they don't do that [drink excessively] ... - (uniformed personnel, Lightfoot et al., 2009, p. 325)

Table 1. Summary of included studies by population group.

Study (author, year)	Study setting	Study objective	Data collection method and qualitative data sources	Study participants	Alcohol	Other drugs
1 Sex workers Needle et al. (2008)	Durban, South Africa 2005	To examine patterns of drug use and HIV risk behaviours among drug-using, street-based sex workers	A rapid ethnographic assessment combining KIs, FGDs, mapping and observation IDIs	52 (27 men, 25 women) current injection and non-injection drug users in high-risk neighbourhoods.	No	Yes
2 Watt, Kimani, Skinner, and Meade (2016)	Delft, a peri-urban township located approximately 15 miles from central Cape Town, South Africa.	To qualitatively examine the experiences of sex trading among methamphetamine users in Cape Town, South Africa		30 active methamphetamine users (17 men, 13 women) recruited from the community	No	Yes
3 Izugbara (2005)	Aba, a commercial town in Abia State, Nigeria.	(i) To describe sex work risks as they are understood, expressed, and acted upon by sex workers themselves. (ii) To evaluate the implications of lay constructions of sex work risks for the lives of sex workers, their extent of representation within mainstream accounts and understanding of sex work risks, and their influence in the planning and delivery of interventions for sex workers.	Snow ball sampling: IDIs ($n = 127$) 6 FGDs ($n = 44$), personal observations	Self-employed brothel-based, street working, casual, and free-floating female sex workers, aged 16–41 years	Yes	Yes
4 Mbonye et al., (2012a)	Women working in high HIV/STI risk environments, Kampala, Uganda. March 2010 to June 2011	To explore how gender inequities may have played a role in facilitating the entry of women into sex work	Life stories: In-depth life history interviews with repeat interviews	Peer leaders of self-identified sex workers ($n = 58$)	Yes	Yes
5 Mbonye et al., (2013)	Kampala, Uganda. Common sex work locations were streets/roadsides, bars and night clubs. March 2010 to June 2011	(i) To describe a setting in which women provide sex for money in a busy Kampala suburb (ii) To understand better, and potentially inform, interventions for this most at risk group of people.	Life history and work place IDIs ($n = 67$)	Women aged 16–49 years whose sole income was from sex work, or who engaged in sex work as a supplementary source of income	Yes	No
6 Mbonye et al., (2016)	Female sex workers attending a clinic for high risk women in Kampala, Uganda. July to December 2015	To explore perceptions and experiences regarding prompt ART initiation, after the change in ART guidelines.	Repeat IDIs ($n = 15$)	Female sex workers, both HIV negative and positive, some had started ART while others had deferred ART.	Yes	No
7 Langa et al. (2014)	Three major Mozambican urban centers: Beira, Nacala, Maputo. November 2007 to January 2008	To obtain information on behaviours of commercial sex workers, their perceptions of risk, and their outcomes to inform the creation and implementation of successful AIDS health and prevention measures.	International Rapid Assessment, Response and Evaluation (I-RARE) methodology. Semi-structured key informant IDIs ($n = 129$) FGDs ($n = 17$)	Commercial female sex workers ($n = 236$) Male clients of commercial sex workers ($n = 47$) Policy makers ($n = 13$), gender not described Health service providers ($n = 50$), gender not described	Yes	No

8	Onyango et al., (2015)	Kumasi, Ghana	To identify social, economic, structural, and individual-level vulnerabilities of female adolescents who sell sex in Kumasi, Ghana.	Snowball sampling: 24 IDIs, 4 FGDs	Female sex workers aged 18–20 years who had been involved in sex work for at least 2 years ($n = 48$)	Yes	No
9	Parry et al. (2008)	'Hotspots' for drug use and sexual risk in Cape Town, Durban and Pretoria, South Africa.	To examine the links between drug use and high-risk sexual practices and HIV in vulnerable drug-using populations in South Africa, including CSWs, MSM, IDUs and non-injecting drug users who are not CSWs or MSM.	Rapid assessment ethnographic study Purposive snowball sampling and street intercepts were used to recruit drug users.	Observation, mapping, key informant interviews and focus groups. Key informant interviews ($n = 131$, 65% male) 21 FGDs ($n = 109$) involved drug users and service providers, MSM, commercial sex workers. Participants aged 18–62 years	Yes	Yes
10	Parry et al. (2009)	Drug using sex workers in Cape Town, Durban, Pretoria, South Africa:	(i) To describe the nature, extent and context of drug use, and sexual behaviour among drug-using CSW and to understand the drug using and sexual behaviours that increase vulnerability for HIV infection. (ii) To assess knowledge and understanding of HIV, drugs, and HIV services and explore views on how to improve access to services. (iii) To identify possible strategies for introducing and scaling up sustainable interventions	Rapid assessment of HIV risk behaviour. Key informant interviews ($n = 67$) 10 FGDs Conducted using I-RARE methodology.	Male and female street CSWs Of the 67 CSWs interviewed individually, 31 were IDUs and 24 were MSM	Yes	Yes
11	Ediomo-Ubong (2012)	Sex workers in Ikot Ekpene, Akwa Ibom State, Nigeria.	To examine drug use and sexual health risks among sex workers	IDIs and FGDs	Brothel-based female sex workers ($n = 86$)	Yes	Yes
12	Schulkind, Mbonye, Watts, and Seeley (2016)	Women at high risk of sexually transmitted infection (including HIV) and their regular male partners in Kampala, Uganda. July 2013–September 2014	To explore the interaction between gender-based violence and alcohol use and their links to vulnerability to HIV-infection	In-depth life history interviews. Each participant was interviewed on three separate occasions.	$N = 20$ (10 women and their regular male partners) Six of the women were current or former sex workers.	Yes	Yes
	Fishing communities						
13	Lubega et al., (2015)	Kasensero fishing community, with HIV incidence 4.3 and 3.1 per 100 person-years in women and men, respectively. April–September 2014.	To understand the underlying contextual drivers of the high HIV rate in Kasensero from the perspective of the community itself for effective policy and preventive intervention formulation	20 IDIs (10 males, 10 females) 12 FGDs ($n = 92$), men and women	HIV positive and HIV negative respondents	Yes	Yes

(Continued)

Table 1. Continued.

Study (author, year)	Study setting	Study objective	Data collection method and qualitative data sources	Study participants	Alcohol	Other drugs
14 Michalopoulos et al. (2017)	Migratory female fish traders sheltered in seasonal camps, Kafue flatlands, Lusaka, Zambia. August 2014–January 2015	(1) Examining trauma history, trauma symptoms and HIV risk behaviour and, (2) the relationship between these co-occurring issues among female fish traders from the Kafue flatlands in Zambia	20 semi structured qualitative interviews, 1 FGD (<i>n</i> = 12)	Female fish traders	Yes	Yes
15 Sileo et al. (2016)	Gerenge, Uganda, a ‘landing site’ along Lake Victoria, with presence of transient CSW and fishermen populations.	To examine motivation for alcohol use and perceptions of how alcohol use influences sexual behaviour and HIV risk. To examine contextual and structural factors influencing alcohol use during sex, as well as alcohol use and sexual risk in the general community. To elicit suggestions for interventions to reduce alcohol and HIV risk behaviours in fish landing sites	8 FGDs (<i>n</i> = 50; 23 male, 27 female): Separate focus groups were conducted based on participant occupation: fishermen (<i>n</i> = 13; all male), fishmongers (<i>n</i> = 13; 9 male, 4 female), alcohol sellers (<i>n</i> = 12; 1 male, 11 female), FSWs (<i>n</i> = 6; all female), and restaurant owners (<i>n</i> = 6; all female).	Fishermen, fishmongers, alcohol-sellers, commercial sex workers, and restaurant owners.	Yes	No
16 Abikoye (2015)	Yenagoa, Balyesa state, Niger delta, Nigeria	Exploring factors opposing the effective management of substance use disorders in	IDIs (<i>n</i> = 4) FGDs (<i>n</i> = 48, 8 groups)	Informal caregivers of patients with substance use disorders (<i>n</i> = 48; 36 female 12 male) Nurses, females (<i>n</i> = 2) Psychiatrists, men (<i>n</i> = 2)	No	Yes
17 Nwokoji and Ajuwon (2004)	Uniformed personnel Nigerian Navy personnel in Lagos	To describe the knowledge of AIDS and HIV-risk sexual behaviour of naval personnel in Lagos.	1 Group discussions (<i>n</i> = 4) KII (<i>n</i> = 4)	Nigerian military, gender not described	Yes	No
18 Erinsho et al. (2012)	Truckers Nigeria: in 3 communities Ugep (high HIV prevalence 12%), Olunloyo (low HIV prevalence 2.2%, Badeku)	To ascertain the risky behavioural factors that are driving the HIV/AIDS epidemic	An ethnographic semi-longitudinal study combining (<i>n</i> = 250), (<i>n</i> = 20), KII (<i>n</i> = 30)	Study participants including community members, opinion leaders, policymakers, healthcare practitioners and religious leaders were selected purposively, gender not described	Yes	No
19 Kohli et al. (2017)	Iringa, Tanzania – a region characterised by high levels of migration and mobility	To identify and describe the social and structural factors that may contribute to HIV risk among truck drivers	11 IDIs	Truck drivers, male	Yes	No
20 Matovu and Ssebadduka (2013) [†]	Conducted at 12 hotspots*, on two major transport corridors. November–December 2008.	To explore knowledge, attitudes and barriers to condom use among FSWs and truckers operating along major transport corridors in Uganda.	Mixed methods study: 24 FGDs (<i>n</i> = 207)	Long distance truckers (all male, <i>n</i> = 96) and female sex workers (<i>n</i> = 111)	Yes	No

21	Lightfoot et al. (2009)	Remote Namibian mining community June 2008	(1) To assess knowledge regarding the link between HIV and alcohol use (2) To assess mechanisms affecting how alcohol consumption leads to higher-risk sexual behaviours	6 FGDs, 16 IDIs	Mine workers ($n = 7$) (5 men; 2 women), Foreman and supervisors (7 men) Mine workers who had received treatment for substance abuse (8 men; 1 women) Oshiwambo-speaking workers (8 men), workers' spouses (8 women), youth (7 men)	Yes	No
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*A hotspot was defined as an area frequented by female sex workers and characterised by high levels of illicit sex.

†The study was conducted among sex workers and truckers.

Table 2. Methodological quality of included studies ($n = 21$).

		Agreed assessment for each study		
		Met criterion (n)	Did not meet criterion (n)	Unclear (n)
1	Is this study qualitative research?	21	–	–
2	Are research questions clearly stated?	18	3 (Erinosho et al., 2012; Langa et al., 2014; Watt et al., 2016)	–
3	Is the qualitative approach clearly described?	18	1 (Kohli et al., 2017)	2 (Erinosho et al., 2012; Nwokoji & Ajuwon, 2004)
4	Is the approach appropriate for the research question?	18	2 (Nwokoji & Ajuwon, 2004) (Erinosho et al., 2012)	1 (Parry et al., 2008)
5	Is the study context clearly described?	18	3 (Erinosho et al., 2012; Nwokoji & Ajuwon, 2004) (Kohli et al., 2017)	–
6	Is the role of the researcher clearly described?	16	4 (Erinosho et al., 2012; Matovu & Ssebadduka, 2013; Nelson, 2012; Nwokoji & Ajuwon, 2004)	1 (Kohli et al., 2017)
7	Is the sampling strategy clearly described?	17	3 (Erinosho et al., 2012; Nelson, 2012; Nwokoji & Ajuwon, 2004)	1 (Kohli et al., 2017)
8	Is the sampling strategy appropriate for the research question?	19	1 (Erinosho et al., 2012)	1 (Nwokoji & Ajuwon, 2004)
9	Is the method of data collection clearly described?	17	2 (Nelson, 2012; Nwokoji & Ajuwon, 2004)	1 (Kohli et al., 2017)
10	Is the data collection method appropriate to the research question?	21	–	–
11	Is the method of the analysis clearly described?	19	2 (Erinosho et al., 2012) (Nwokoji & Ajuwon, 2004)	–
12	Is the analysis appropriate for the research question?	19	1 (Erinosho et al., 2012)	1 (Nwokoji & Ajuwon, 2004)
13	Are the claims made supported by sufficient evidence?	20	1 (Erinosho et al., 2012)	–

Gendered patterns of substance use

Studies reported that experiences with drug and alcohol use for women centered more on the personal and emotional aspects of drug-related experiences while men's experiences focused more on external factors such as socialisation and financial gain from sale of drugs. For example, in the mining sector, men employed in lower-ranking jobs often drank together in groups without interference from their family members whom they were often separated from, and to foster their group identity (Lightfoot, Maree, & Ananias, 2009). Similarly, in fishing communities, fishermen collectively used drugs and alcohol to cope with work-related stress (Sileo et al., 2016).

'Physical and psychosocial stress'

Most occupational groups appeared to suffer some form of physical and psychosocial stress that drove their use of substances. Among fishermen, substance use was used to cope with work-related stress due to inconsistent/unpredictable income (Sileo, 2015; Sileo et al., 2016), prolonged working hours overnight (Sileo, 2015; Sileo et al., 2016) and fear of drowning (Lubega et al., 2015; Sileo, 2015; Sileo et al., 2016).

Loneliness was linked to relational deprivations mostly of family and social encounters characterised by some form of separateness. Among miners, feelings of loneliness were exacerbated by the structure of the mining workforce which relies on male migrant workers living in hostels and working irregular hours. Among uniformed personnel feelings of loneliness were triggered by prolonged separation from families. These feelings were counterbalanced by indulging in substance use as explained in the quote from a miner below'.

'... People are looking for things to vent their frustrations of loneliness'. Another said: 'Most of them are not youngsters. They leave their family behind in the north. It's quite difficult visiting your families. You can take three weeks per year: You don't know what to do with yourselves. So you get together and have a drink or two ... It's nice. You don't feel lonely ...' – (mine worker, Lightfoot et al., 2009, p. 324)

Among sex workers, using substances shielded them from the negative effects of commercial sex work including feelings of stigma, low self-esteem, guilt and self-condemnation, frequent intimidation by male clients/law enforcement agents and the risk of rejection by friends and family. Street-based sex workers reported experiencing cold at night and sleep deprivation and often used alcohol or illicit drugs to counteract this.

... Most of our women (referring to sex workers) drink and smoke a lot. I too smoke and drink ... you know, in a situation where people treat you like the worst sinner you must find a way to feel like you are somebody. Sometimes your mind will be condemning you harshly ... but when you drink and you are high, you feel normal ... That is how we survive in this work ... – (sex worker, Ediomu-Ubong, 2012, p. 99)

External influence from pimps, sex work clients, and peers

Sex workers' substance abuse patterns were often shaped by sex work clients and pimps who linked clients to sex workers, and sold and used substances themselves (Needle et al., 2008; Parry et al., 2008; Parry et al., 2009). On some occasions, clients invited and or pressured hired sex workers to use or share their illicit drugs with them (Mbonye et al., 2013; Sileo et al., 2016). Sex workers commonly received alcohol and illicit drugs from their clients as non-monetary payment for sex, and risked condomless sex to access illicit drugs.

... If they [the dealers] know you are a customer of them, you just go there, and you say ... give me a wake-up, man. Then they say okay, there's your wake-up.¹ Then he knows, he will give you the wake-up, but that wake-up will make that you must return to him ... so then ... you get money, then you will go straight again back to him ... – (male sex worker, Parry et al., 2009, p. 856)

In South Africa and Nigeria, pimps facilitated transactions that helped to initiate and maintain relations between sex workers and their clients including providing sex workers with

income, sex clients, illicit drugs, alcohol, shelter, and protection against violence (Ediomo-Ubong, 2012).

Poverty

High-risk occupational groups were mostly characterised by low socio-economic status and used substances as a means for income generation.

... You get these customers, they come to you and they want you ... they are rock smokers themselves and it's the girls, the working girls who put these men on to that. They tell them it's a love drug, they will make love better. Even me, I have put somebody else onto it, just to get them to smoke so you can get more money ... - (female sex worker, Needle et al., 2008, p. 1451)

However, among miners and fisherfolk, the daily disposable income in an environment of poverty was often spent on consumption; this included substance use.

... Here we have too much money. In other places, they can only buy one or two [drinks]. Here they can buy ten ... the richer you go, the worse it [drinking] gets. - (Miner, Lightfoot et al., 2009, pp. 324–325)

Substance use and transactional sex were all closely tied to the local economies of high-risk occupational groups. Access to disposable income for all occupational groups directly or indirectly increased the risk for both substance use and risky sex (Nwokoji & Ajuwon, 2004). Among fishermen, impulsive spending on substance use was exacerbated by limited access to banking services to facilitate saving (Sileo, 2015; Sileo et al., 2016).

'... during windy periods, fishermen don't work; [they] don't have money so they don't drink ...'. Alcohol sellers also reported that during periods of weak alcohol sales they would also engage in sex work to survive— Female alcohol seller in fishing community. (Sileo et al., 2016, p. 542)

Risk of violence

Alcohol and illicit drug use were a means to counter the risk of client violence against sex workers, including rape, refusal to pay for sex, and extortion through giving sex workers courage against abuses and victimisation. This facilitated substance use and consequently addiction among sex workers.

... You have to drink, smoke and be smart. In this work, you cannot be soft and think you will survive. You must be tough. You have to stand up for yourself because if you don't nobody will do that for you ... most women are not naturally strong that is why most of us take a lot of drinks to give us courage so that when a man wants to do something funny, you can defend yourself ... (sex worker, Ediomo-Ubong, 2012, p. 99)

Proximity to substance use establishments

Across all occupational groups, substance use patterns were shaped by the work environment. All occupational groups lived or worked in close proximity to bars/lodges and illicit drug selling establishments some of which operated all the time. Members of occupational groups were regular patrons at these facilities to access cheap over-night accommodation, alcohol and illicit drugs. Furthermore, the institutional context of working in bars potentially influenced substance use through inadequate regulation of sale and consumption of substances, and access to pimps. Conversely, although bars were perceived to charge higher prices for alcohol than other alcohol selling stores, some sex workers preferred to work in bars to easily access clients and to reduce the risk of violence.

Performance enhancement

Sex workers, fisherfolk, and truckers all used substances to enhance their individual performance at work, enabling them to meet physical demands, including long working hours, and coping with night chills for sex workers and fishermen (Ediomo-Ubong, 2012; Parry et al., 2009; Sileo et al., 2016).

... Sometimes when there is less fish at the site, the fishermen have little money and they don't buy us expensively. You have to sleep with many men (5–10) in a day to earn a living so sometimes we have to take alcohol or drugs (marijuana) so we have the courage to do this or even not to feel the psychological pain ... – (barmaid/sex worker, fishing community, Lubega et al., 2015, p. 7)

Sex workers reported experiencing several negative physical and psychosocial processes during their work that played a role in their choice and use of substances and contributed to unfavourable outcomes. The psychosocial processes experienced by sex workers included stigma associated with belonging to a marginalised group; engagement with pimps and clients; multiple sexual encounters; past feelings and experiences of stress, grief, low self-esteem and trauma; loneliness and the need to express personal agency (Izugbara, 2005). Substance use eliminated inhibitions, boosted sex workers' self-esteem and tended to desensitise sex workers to the traumatic effects of sex work (Parry et al., 2009). Mine workers used substances to better cope with working irregular hours.

The authors of a few papers reported that sex workers mentioned drinking and illicit drug use before and during sex work, in order to be sexually forward, and to achieve sexual effects such as enhancing the sexual experience including stimulating sexual arousal, prolonging the sexual experience and having multiple sexual partners and ease of negotiating condom and or non-condom use as necessary (Mbonye et al., 2013; Parry et al., 2009).

... We would take alcohol and even forget to ask for money. I used to take too much of it and it was up to the man to put on the condom ... that alcohol eliminates shyness and you become bold. It gives you happiness and you forget about all your worries ... – (sex worker, Mbonye et al., 2012a, 2012b, p. 6)

Inadequate healthcare services

High-risk occupational groups are vulnerable to substance use due to inadequate prevention, treatment and mitigation measures and limited access to alcohol reduction interventions and harm reduction services more generally (Abikoye, 2015).

Discussion

In this review of qualitative data on alcohol misuse and illicit drug use among occupational groups at high-risk of HIV in SSA, we describe multi-level experiences and determinants of substance use. A major finding of our review is that despite differences in local contexts and patterns of use, harmful drinking and illicit drug use are common across the different high-risk occupational groups studied, and are part of the occupational culture. Patterns and frequency of alcohol and illicit drug use were commonly linked with multi-level interacting factors in particular social, workplace and employment characteristics of different occupational high-risk groups. The risk for substance use among these sub-populations was further compounded by the lack of local harm reduction services.

Our review suggests that compared to the general population, occupational groups engaged in high-risk activities might be more vulnerable to hazardous drinking and chronic illicit drug use, and therefore may suffer adverse consequences from the associated complications.

There was substantial overlap in both individual and contextual factors for substance use across the papers reviewed. At individual level, our findings show that substance use consequently directly facilitated participation in work, particularly for sex workers (Needle et al., 2008; Parry et al., 2008; Parry et al., 2009) and fisherfolk (Lubega et al., 2015; Sileo et al., 2016). The most common pathway to substance use was motivational, both for enhancement of positive emotions – such as improved ability to be sexually forward and – reduction of negative feelings – such as stress management and perceived work-related vulnerabilities. This was similar to pathways identified by Cox and Klinger (Cox & Klinger, 2011).

Across the population groups, sex work as a livelihood has received greatest focus, with sex workers viewed as a subset of people whose illicit drug use has become problematic, and who

could benefit from harm reduction services (Jeal, Macleod, Turner, & Salisbury, 2015; Li, Li, & Stanton, 2010). Alcohol and illicit drug use by other occupational groups at high-risk of HIV was less well documented and understood, with a dearth of information on related harms and ways to reduce them in these sub-groups.

Individual behaviour in these sub-populations continues to be shaped by people's immediate physical and social environment such as residing in an environment with access to bars and lodges for leisure, as well as interactions between systems and individuals (Sallis, Owen, & Fisher, 2008). The social and symbolic context of drinking and illicit drug use suggests that effective interventions around substance use should not be limited to drinking environments alone but should mirror the patterns of sale, promotion and distribution of substances many of which occur outside alcohol and drug selling establishments and may involve pimps who largely determine patterns of substance use (Needle et al., 2008; Parry et al., 2008; Parry et al., 2009).

The most common structural drivers of substance use were separation from family and widespread poverty. Poverty related sub-themes interacted in complex ways with implications for problem drinking and illicit drug addiction. In addition, sex workers and fisherfolk (Sileo et al., 2016) used substances to gain control over their clients for more money, and to facilitate condom or non-condom use negotiations, as necessary.

Some risk factors for substance use varied by occupational group and gender. Among sex workers, alcohol and illicit drug use was shaped by the social organisation of sex work, including attracting and maintaining relations with clients, enhancing role performance, coping with stigma and threats of violence from clients, pimps and law enforcement agents. In fishing communities, certain gender-focussed roles (such as fishing, mainly conducted by men) were associated with alcohol and illicit drug use. Harm reduction services will need to be responsive to the occupational norms and gender roles of the different high-risk groups.

Most of the occupational groups were mobile or migratory to maintain their livelihoods, and this was reported to increase their likelihood of using substances, firstly to better cope with prolonged separation from family and secondly because the social structures that otherwise constrained substance use in home communities may not apply in the context of their new setting. Migration patterns may contribute not only to increased substance use but also to sexual risk in general (Kissling et al., 2005).

Mixing of high-risk occupational groups is common, and there is an overlapping of sex work and illicit drug use, behaviours and economies. This is partly because of the unstable social situations of the groups including high mobility and 'hot spots' for commercial sex activity where long-distance truckers, fisherfolk, uniformed personnel, miners regularly commune. Similarly, the different occupational groups spent most of their leisure time in bars and brothels where sex work, alcohol and illicit drugs were commonly sold and consumed. This evidence further highlights the need for alcohol-related and harm reduction services and policies that take into account the social networks of high-risk occupation groups.

Despite reports of alcohol misuse and increasing intravenous injection of illicit drugs and their association with risky sex among young people in SSA (Beckerleg, Telfer, & Hundt, 2005; Francis, Grosskurth, Chantalucha, Kapiga, & Weiss, 2014; Nkowane et al., 2004; Reid, 2009), research on substance use among young people in high-risk occupational settings is very limited. Yet it is critical to tailored programming. Young people in these settings are likely to be particularly vulnerable to alcohol and illicit drug use related harms for several reasons including developmental, social economic and environmental factors. Furthermore, their vulnerability may be exacerbated by barriers to accessing help ranging from limited information about their risks and rights to legal age and sex work restrictions that impede access to harm reduction services.

Interventions

Drawing on the social-ecological model of occupational factors influencing substance use (Figure 1), interventions should be designed which acknowledge that substance use is integral to high-risk

groups; the role of sexual networks in reinforcing substance use; and the influence of gender and poverty on substance use.

There is a danger that focusing too narrowly on these groups or on substance-using individuals neglects other sub-populations at high-risk, such as young people. We suggest that to avert substance use in these sub-groups, the net of alcohol reduction and harm reduction interventions be cast wider, to include all young people. Interventions should build on social and family support mechanisms, be tailored towards community needs, and not be simply targeted to individuals. In addition, given the overlap between sex work as an occupation, and the other occupations, there may be a place for harm reduction interventions in venues frequented by multiple occupations. High-risk occupation communities in developing countries are often mobile and socially marginalised and have poor access to facilities and medicines and low uptake of available health services (Seeley & Allison, 2005). One way to improve the likelihood of both developing effective interventions and improving the success of adoption and implementation in these communities is through renewed efforts to strengthen the structural interventions component of HIV combination prevention services to include alcohol reduction and harm reduction interventions (Campbell, Tross, & Calsyn, 2013).

Research could also focus on other structural issues that our systematic review uncovered such as violence (Javalkar et al., 2019; Starmann et al., 2018), stigma, discrimination and the legal status of sex work as an occupation (Blanchard et al., 2018). These social, legal, and economic injustices not only contribute to sex workers' high risk of acquiring HIV but also substance abuse, and would be important to address (Rusakova, Rakhmetova, & Strathdee, 2015).

Recommendations

In addition to harm-reduction research, literature recommends structural interventions in sex work contexts where substance abuse increases vulnerability to HIV including removal of legal barriers through the decriminalisation of sex work (Blanchard et al., 2018; Javalkar et al., 2019; Shannon et al., 2018; Starmann et al., 2018). Future research should, in particular, explore: (i) individual and contextual factors associated with substance use (initiation, promotion and continued use) among young people aged 18 years and below, in key population settings; (ii) pathways to substance use among under-researched groups such as uniformed personnel, truckers and miners, paying attention to the unique contribution of their work and work environments.

Study strength

To our knowledge, this is the first review summarising qualitative data on alcohol misuse and illicit drug use among occupational groups at high-risk of HIV in SSA.

Study limitations

The main limitations include firstly the lack of diversity; our search yielded fewer papers from uniformed personnel, truckers and miners, hence biasing our review to sex workers and fisherfolk, whose pathways to alcohol and illicit drug use in the context of their work may be different. Secondly, studies among uniformed personnel and truckers only reported on alcohol and not illicit drugs. It is unclear whether this reflects a lack of usage of other drugs in these populations or simply a lack of research on this. Either way, our exploration of illicit drug use was consequently limited to only certain key population groups. Other limitations are that the final code was not applied to all of the manuscripts and the study quality was not consistent across the included manuscripts.

Conclusion

The findings of this data synthesis highlight that there are interrelated motivations for alcohol misuse, illicit drug use and sex work among occupational groups at high risk of HIV. Joint HIV prevention and harm reduction interventions that are responsive to contextual and occupational risk factors are critical.

Note

1. 'wake ups' are usually small pieces of crack cocaine given to male and female sex workers by pimps (whether they work for them or not) in order to motivate the sex worker to earn money and to ensure that the sex worker returns to buy more drugs from them.

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