

## Review

# A systematic review of task-sharing interventions for substance use and substance use disorder in low- and middle-income countries

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## ABSTRACT

**Introduction:** Substance use (SU) and substance use disorders (SUDs) are associated with adverse health and socio-economic consequences. Due to the shortage of specialist healthcare providers, people with SUDs in low- and middle-income countries (LMICs) have limited access to adequate treatment. Task-sharing with non-specialist health workers (NSHWs) has the potential to improve treatment accessibility for these individuals. This review synthesizes the evidence on the effectiveness of task-sharing interventions for SU and SUDs outcomes in LMICs.

**Methods:** PsycINFO, MEDLINE, EMBASE, Global Health and CENTRAL databases were searched to identify eligible studies. Quality assessment was conducted using the Cochrane risk of bias (RoB2) and Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) tool. A narrative synthesis was undertaken to analyze the data.

**Results:** Nineteen RCTs and two quasi-experimental studies met the eligibility criteria, and the majority had a low risk of bias rating. NSHW-delivered interventions significantly impact SU and SUDs outcomes, particularly in reducing alcohol and other substance use, cessation of smoking, and use of opioids. Multiple sessions delivered via face-to-face interactions was the most utilized method for intervention delivery. There were variations in terms of components of the intervention across studies; however, the most common intervention strategies used were a) personalized feedback, b) psychoeducation, c) motivational enhancement, d) problem-solving, and e) coping skills.

**Conclusion:** Our review highlights the growing interests in leveraging NSHWs to provide interventions to people with SU and SUDs in LMICs where access to treatment is limited. However, additional research is necessary to explore the effectiveness of these interventions and identify the specific active components linked to enhancing treatment outcomes on a broader scale.

## 1. Introduction

SU and SUDs are associated with adverse health and socio-economic consequences (Degenhardt et al., 2018). The 2019 United Nations Office on Drugs and Crime (UNODC) report estimated that illicit SU among individuals aged 15–64 increased from 226 million to 274 million between 2010 and 2019, with an estimated 36 million suffering from SUDs; a significant proportion of whom reside in LMICs (World Drug Report, 2020; GLOBAL OVERVIEW: DRUG DEMAND DRUG SUPPLY, 2022). The effects of globalization, conflict, migration, and population growth are thought to contribute to the recent increase in the levels and

patterns of SU in LMICs (Degenhardt et al., 2018; Uchtenhagen, 2004). Alcohol was identified as the leading risk factor for disability and death in LMICs, particularly in Sub-Saharan Africa, South Asia, and Latin America (Lim et al., 2012). Similarly, tobacco is one of the leading risk factors for premature mortality, with a significant proportion of people who use tobacco residing in LMICs (Reitsma et al., 2017).

Globally the number of people who use substance is expected to increase significantly by 2030, with the majority likely to be in LMICs, specifically in Africa and parts of Asia (GLOBAL OVERVIEW: DRUG DEMAND DRUG SUPPLY, 2022). Approximately 90% of people with mental health needs and SUDs in LMICs do not have access to treatment,

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and even those with access, do not receive adequate treatment (Degenhardt et al., 2018; Whiteford et al., 2015). Significant barriers underpinning this gap are stigmatization, lack of funding, shortage of specialist mental health workers, geographic barriers, inequity in the distribution of services and inefficient use of available resources (Nadkarni and Bhatia, 2019). Given the increasing demand for healthcare in the face of the shortage of resources, the World Health Organisation (WHO) has recommended using task-sharing strategies to improve treatment coverage in underserved settings in High Income Countries (HICs) and LMICs (Task, Hoefl et al., 2018).

Task sharing (re-distribution of tasks from specialists to less trained individuals to expand access to care) emphasises on training and supervising non-specialist cadres to improve capacity, optimize utilization of available resources, and increase workforce capacity to meet priority mental health needs (Sharing and Shifting, 2022). Although a recent Cochrane review evaluated a range of non-specialist health worker (NSHW)-delivered interventions for several mental health conditions, including SU in LMICs (van Ginneken et al., 2021), it was focused only on primary care settings. This review focuses solely on SU and SUDs and examines models of care beyond primary healthcare. Additionally, we wanted to explore details about the interventions, such as the key intervention components and implementation characteristics. More specifically, our objectives were to evaluate the evidence on the effectiveness of NSHW-delivered interventions for SU and SUDs in LMICs; and identify and summarize the content and methods adopted to deliver these interventions. It is important to note that when we discuss SU, we are referring to problematic substance use which, is a broader term used in various contexts. This term encompasses risky use of substance without meeting the specific diagnostic criteria for a clinical disorder (Tait and Christensen, 2010).

## 2. Methodology

### 2.1. Design

Systematic review. The protocol was registered a priori on Prospero (registration number CRD42022343223).

### 2.2. Eligibility criteria

We included randomized controlled trials (RCTs), pilot RCTs, and non-randomized controlled trials (quasi-experimental) conducted in LMICs (as classified by the World Bank). The initial plan in the protocol was to include other study types. However, this was later revised to include solely RCTs and non-RCTs to align with the review's objectives.

The primary population of interest were adults ( $\geq 18$  years) with problematic SU and/or SUDs (with or without physical and/or mental co-morbidity).

Studies were included if participants were clinically diagnosed with SUDs according to either the Diagnostic and Statistical Manual of Mental Disorders (DSM IV/5) or International Classification of Diseases (ICD-10/11) criteria. Additionally, we included studies if problematic SU was confirmed through self-report and/or a validated screening instrument.

Furthermore, studies on interventions delivered through task-sharing with NSHWs were included. We defined NSHWs as individuals with limited or no formal mental health training, capable of performing tasks when supervised by specialists. This group encompasses professional health workers (e.g., doctors, nurses, and general para-professionals) and non-professionals such as community health workers (CHWs), lay providers, and village health workers (VHWs), depending on the context (Nadkarni and Bhatia, 2019). We excluded studies in which interventions were delivered by specialists or exclusively by technological means without any human interface.

We only included studies that reported changes in SU and SUDs as the main primary outcome, such as reduction in use or abstinence, and change/difference in scores on a standardised tool (A tool that has been

developed, tested, and refined in accordance with established standards to ensure reliability and validity), such as The Alcohol Use Disorder Identification Test (AUDIT), Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). Secondary outcomes of interest included change in substance-related consequences such as accidents and quality of life.

### 2.3. Search strategy

We searched the following databases for articles published from inception to 28th of June 2022: 1) PsycINFO, 2) MEDLINE, 3) Excerpta Medical dataBASE (EMBASE), 4) Global Health, and 5) Cochrane Central Register of controlled trials (CENTRAL). Search terms were developed and structured around the concepts of: 'substance use' (e.g., psychoactive substance, alcohol, cannabis, tobacco, illicit drug use/abuse), 'task sharing/shifting' (e.g., lay health worker, peer health worker, village health worker), and 'LMICs' based on the Cochrane LMIC filter 2020 (e.g., developing country, low and middle-income countries). The detailed search strategy used in Medline is described in Appendix A. In addition, we did manual hand-searching of the reference list of studies included in the review for relevant research not identified by the database search.

### 2.4. Study selection and data extraction

Search returns from the databases were exported and compiled into Mendeley reference manager, where duplicates were identified and removed (Mendeley - Reference Management Software Internet, 2023). Titles and abstracts of the remaining citations were then imported into Rayyan QCRI for eligibility screening, and a second de-duplication was conducted (Ouzzani et al., 2016). Two reviewers (AA and AM) performed screening of study titles, abstracts, and full texts sequentially. Reviewers resolved disagreements through discussion until consensus was achieved; additionally, a second author AN was consulted when needed. Relevant data from the final set of included studies were extracted by AA using a spreadsheet exclusively designed for the review guided by the Cochrane data collection form for RCTs and non-RCTs. Extracted data included information about the study design and setting, the demographics of the target population, the sample size, intervention details (delivery agent, method of delivery, intervention content, timing, fidelity) control group(s), outcome measures (primary and secondary), and a summary of results. The second reviewer (AM) cross-checked the data extracted from each study for completeness and accuracy, and an agreement was reached through discussion regarding the final content.

### 2.5. Risk of bias assessment

The risk of bias tool (ROB2) for RCTs was used to assess the methodological quality of the included RCTs (Higgins et al., 2011). The tool assesses bias across five domains comprising a series of signaling questions to elicit information relevant to bias. The overall risk of bias rating assigned to studies included: high risk, low risk, or some concern. In addition, the Cochrane Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) tool was used to assess quasi-experimental studies included in the review (Sterne et al., 2016). The risk of bias was evaluated through signaling questions within specific domains and rated as low, moderate, serious, and critical risk of bias. Two reviewers (AA and AM) independently assessed the risk of bias, and consensus was reached through discussion.

### 2.6. Data synthesis

Due to the heterogeneity between the selected studies in terms of 1) the type of population (people who use substance), 2) the type of interventions delivered, 3) the timing of measures, 4) the different

measurement tools, and 5) the outcomes measured, a narrative synthesis was better suited to analyze the data. Therefore, the synthesis was conducted using the guidelines by Popay and colleagues (Popay et al., 2006), including textual descriptions, tabulations, and study groupings to summarize the findings, explore relationships between and within studies, and develop conclusions and recommendations for the review.

### 3. Results

The search yielded 7397 studies. After de-duplication, the titles and abstracts of 5946 studies were screened. The full texts of the remaining 103 studies were reviewed, following the exclusion of 5843 ineligible studies. 84 full texts were excluded as they did not meet the eligibility criteria, 19 eligible studies and, 2 additional studies retrieved through citation searching were included in the final synthesis. (Fig. 1)

#### 3.1. Study design and population characteristics

Seven papers were from studies conducted in India, three in South Africa, two in Thailand, Malaysia, Zimbabwe, and Kenya, and one in Zambia, Vietnam, and Mexico. These comprised two quasi-experimental studies (Jiang et al., 2019; Takahashi et al., 2018), 13 RCTs (Papas et al., 2021; Aung et al., 2019; Nadkarni et al., 2017a, 2017b; Sorsdahl et al., 2015; Pengpid et al., 2013; Mendez-Ruiz et al., 2020; Madhombiro et al., 2020; Kamal et al., 2020; Jayakrishnan et al., 2013; Mertens et al., 2014; Noknoy et al., 2010a; Schottenfeld et al., 2021) and six pilot RCTs (Nadkarni et al., 2022; Haokip et al., 2021; Chawarski et al., 2008; Ng et al., 2020; Madhombiro et al., 2019a; Kane et al., 2022). In addition,

two papers were from the same RCT but described outcomes assessed at different time points (Nadkarni et al., 2017a, 2017b).

The sample sizes ranged from 40 in a pilot study (Madhombiro et al., 2019a) to 1318 in a quasi-experimental study (Jiang et al., 2019). The interventions were implemented in a range of settings such as tertiary care centers (Sorsdahl et al., 2015; Madhombiro et al., 2020, 2019a; Haokip et al., 2021), public/general facility (Schottenfeld et al., 2021; Kane et al., 2022) mental health centers (Ng et al., 2020), community/primary care centers (Jiang et al., 2019; Papas et al., 2021; Aung et al., 2019; Nadkarni et al., 2017a, 2017b; Mendez-Ruiz et al., 2020; Mertens et al., 2014; Noknoy et al., 2010a; Chawarski et al., 2008), colleges (Pengpid et al., 2013; Kamal et al., 2020; Nadkarni et al., 2022), and the community (Takahashi et al., 2018; Jayakrishnan et al., 2013).

Overall, thirteen studies focused on alcohol use (Takahashi et al., 2018; Papas et al., 2021; Nadkarni et al., 2017a, 2017b, 2022; Pengpid et al., 2013; Mendez-Ruiz et al., 2020; Madhombiro et al., 2020, 2019a; Kamal et al., 2020; Noknoy et al., 2010a; Ng et al., 2020; Kane et al., 2022), two on both alcohol and other drugs (Sorsdahl et al., 2015; Mertens et al., 2014), two on opioids (Schottenfeld et al., 2021; Chawarski et al., 2008), and four on tobacco (Jiang et al., 2019; Aung et al., 2019; Jayakrishnan et al., 2013; Haokip et al., 2021). In studies that reported the mean age of participants, it ranged from 21 (Mertens et al., 2014) to 54 years (Haokip et al., 2021). All studies, apart from eight, recruited both genders (Jiang et al., 2019; Takahashi et al., 2018; Aung et al., 2019; Sorsdahl et al., 2015; Pengpid et al., 2013; Madhombiro et al., 2020, 2019b; Kamal et al., 2020; Mertens et al., 2014; Nadkarni et al., 2022; Haokip et al., 2021; Chawarski et al., 2008; Kane et al., 2022; Noknoy et al., 2010b; Schottenfeld et al., 2021); five studies included

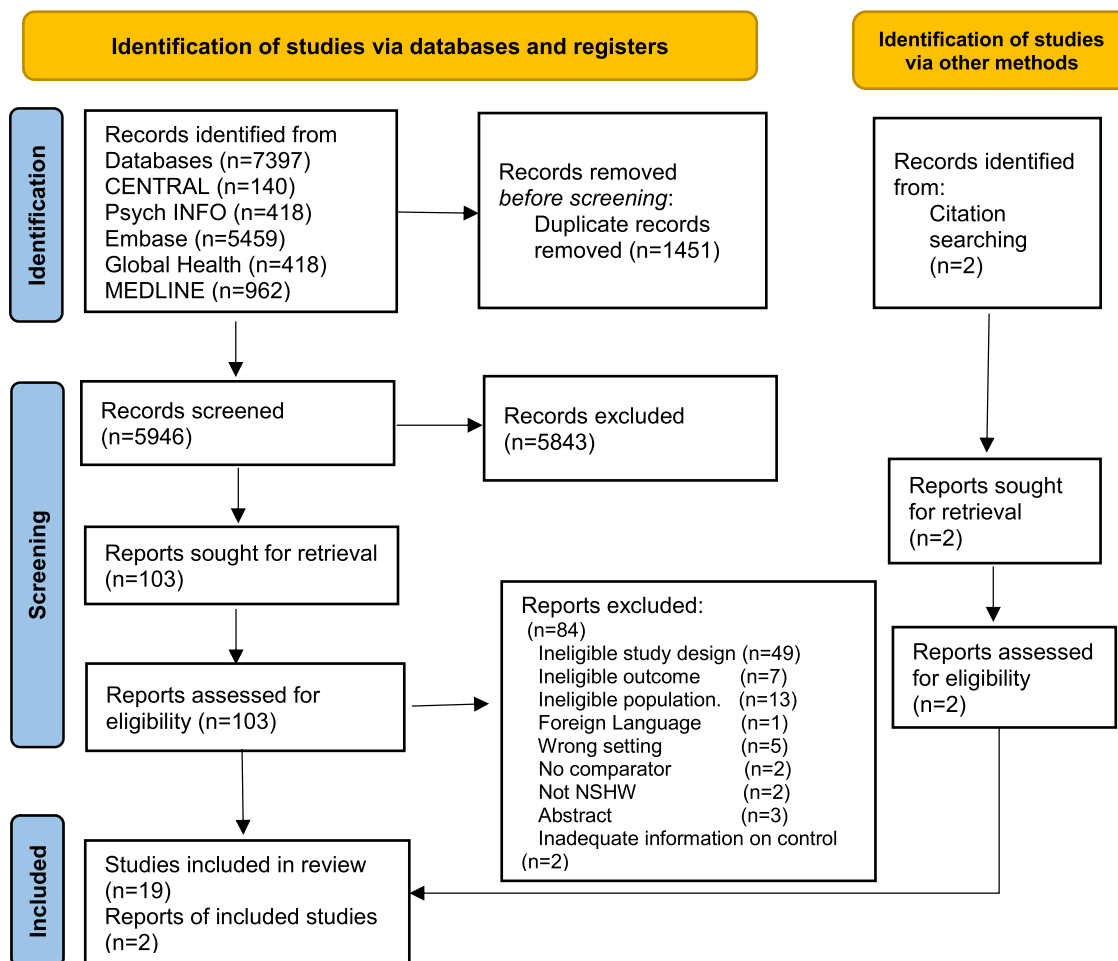


Fig. 1. PRISMA flow diagram showing the study selection process of included studies.

only males (Jayakrishnan et al., 2013; N et al., 2020; Nadkarni et al., 2017a; Nadkarni et al., 2017b; Papas et al., 2021), while one study was restricted to female participants (Mendez-Ruiz et al., 2020). Table 1 summarizes the characteristics of the studies included in this review.

Twelve studies were of low risk of bias rating (Jiang et al., 2019; Takahashi et al., 2018; Aung et al., 2019; Nadkarni et al., 2017a, 2017b, 2022; Sorsdahl et al., 2015; Madhombiro et al., 2020, 2019a; Noknoy et al., 2010a; Haokip et al., 2021; Kane et al., 2022). Seven studies were rated to be of some concern (Papas et al., 2021; Pengpid et al., 2013; Mendez-Ruiz et al., 2020; Kamal et al., 2020; Jayakrishnan et al., 2013; Schottenfeld et al., 2021; Ng et al., 2020), and two were rated as having a high risk of bias (Chawarski et al., 2008; Mertens et al., 2014). Appendix A.

### 3.2. Intervention characteristics

Five studies used brief intervention (BI) with or without an accompanying information leaflet for people who use alcohol (Takahashi et al., 2018; Pengpid et al., 2013; Kamal et al., 2020; Mertens et al., 2014; Nadkarni et al., 2022). Seven studies used motivational interviewing alone or in combination with other psychological interventions such as Cognitive Behaviour Therapy (CBT) and Problem-Solving Therapy (PST) (Kane et al., 2022; Madhombiro et al., 2019a; Nadkarni et al., 2017a; Nadkarni et al., 2017b; Noknoy et al., 2010a; Sorsdahl et al., 2015; Madhombiro et al., 2020). In contrast, others used single interventions like culturally adapted CBT (Papas et al., 2021), body-mind-spirit relapse prevention (Ng et al., 2020), video-assisted intervention (Haokip et al., 2021) and a culturally adapted intervention based on the social cognitive model for behaviour change (Mendez-Ruiz et al., 2020). In addition, two studies used pharmacotherapy in combination with behavioural change intervention (Schottenfeld et al., 2021; Chawarski et al., 2008). Finally, three studies (Jiang et al., 2019; Aung et al., 2019; Jayakrishnan et al., 2013) delivered multiple smoking cessation packages for smokers.<sup>o</sup>

Although there were several overlaps in the intervention components across the studies, the common techniques featured include psycho-education (Jiang et al., 2019; Takahashi et al., 2018; Pengpid et al., 2013; Kamal et al., 2020; Nadkarni et al., 2022; Haokip et al., 2021; N et al., 2020; Chawarski et al., 2008; Schottenfeld et al., 2021), motivation enhancement and coping strategies (Papas et al., 2021; Nadkarni et al., 2017a, 2017b; Sorsdahl et al., 2015; Madhombiro et al., 2020, 2019a; Mertens et al., 2014; Kane et al., 2022; Noknoy et al., 2010b), and social support either in the form of family, community, or peer support (Aung et al., 2019; Mendez-Ruiz et al., 2020; Jayakrishnan et al., 2013). Table 2 shows the characteristics of interventions.

Delivery of intervention primarily included individual face-to-face methods (Jiang et al., 2019; Aung et al., 2019; Sorsdahl et al., 2015; Pengpid et al., 2013; Madhombiro et al., 2020, 2019a; Kamal et al., 2020; Mertens et al., 2014; Noknoy et al., 2010a; Schottenfeld et al., 2021; Nadkarni et al., 2022; Chawarski et al., 2008; Kane et al., 2022). Other less common methods included group sessions (Papas et al., 2021; Mendez-Ruiz et al., 2020; Ng et al., 2020) and virtual delivery through text reminders and educational videos (Haokip et al., 2021). Furthermore, certain studies integrated various delivery methods, such as combining one-on-one in-person sessions with telephone counselling (Nadkarni et al., 2017a, 2017b), face-to-face group delivery and telephone counselling (Jayakrishnan et al., 2013), and individual and group counselling (Takahashi et al., 2018).

The sessions varied in duration and frequency between studies; the shortest were, a 5-minute virtual session (Haokip et al., 2021), and a 5-10-minute face to face (Nadkarni et al., 2022), while the longest, also face-face lasted for 2.5 hours (Mendez-Ruiz et al., 2020). In addition, four studies administered single-session interventions (Pengpid et al., 2013; Kamal et al., 2020; Mertens et al., 2014; Nadkarni et al., 2022), while the rest comprised multiple sessions: most commonly three (Jiang et al., 2019; Takahashi et al., 2018; Noknoy et al., 2010a; Mendez-Ruiz

et al., 2020) to four sessions (Nadkarni et al., 2017a, 2017b; Madhombiro et al., 2019a; Haokip et al., 2021), and less frequently five to twelve sessions (Papas et al., 2021; Sorsdahl et al., 2015; Madhombiro et al., 2020; Ng et al., 2020). Three studies however, delivered more than twelve sessions of the intervention (Kane et al., 2022; Chawarski et al., 2008; Schottenfeld et al., 2021).

The most frequently used NSHWs were nurses (Aung et al., 2019; Pengpid et al., 2013; Mendez-Ruiz et al., 2020; Madhombiro et al., 2020, 2019a; Kamal et al., 2020; Mertens et al., 2014; Noknoy et al., 2010a; Schottenfeld et al., 2021; Haokip et al., 2021; Chawarski et al., 2008; N et al., 2020). Other less commonly utilized NSHWs were lay counsellors (Papas et al., 2021; Nadkarni et al., 2017a, 2017b), peer counsellors (Kane et al., 2022; Sorsdahl et al., 2015) social workers (Jayakrishnan et al., 2013), community health workers (CHWs) (Takahashi et al., 2018), village health workers (VHW) (Jiang et al., 2019), and trained researchers (Nadkarni et al., 2022). The selection of NSHWs was based on relevant work experience and level of training in the majority of the studies (Jiang et al., 2019; Mendez-Ruiz et al., 2020; Madhombiro et al., 2020, 2019a; Kamal et al., 2020; Schottenfeld et al., 2021; Haokip et al., 2021; Chawarski et al., 2008; Ng et al., 2020; Kane et al., 2022). In four studies, recruitment was based on level of education - completed secondary education (Takahashi et al., 2018; Nadkarni et al., 2017a, 2017b) and diploma (Papas et al., 2021). Finally, intervention fidelity was reported in fourteen studies (Jiang et al., 2019; Takahashi et al., 2018; Papas et al., 2021; Nadkarni et al., 2017a, 2017b; Sorsdahl et al., 2015; Pengpid et al., 2013; Madhombiro et al., 2020, 2019a; Kamal et al., 2020; Mertens et al., 2014; Schottenfeld et al., 2021; Chawarski et al., 2008; Kane et al., 2022); various methods were used to assess this process, such as audio and video recordings, feedback, and supervision (Papas et al., 2021; Nadkarni et al., 2017a, 2017b; Madhombiro et al., 2020; Kamal et al., 2020; Mertens et al., 2014; Schottenfeld et al., 2021), supervisory visits at different time points (Pengpid et al., 2013; Chawarski et al., 2008; Kane et al., 2022), observation, checklists/attendance sheets (Jiang et al., 2019; Takahashi et al., 2018; Sorsdahl et al., 2015).

### 3.3. Effectiveness

#### 3.3.1. Alcohol

Thirteen studies focused exclusively on alcohol (Takahashi et al., 2018; Papas et al., 2021; Nadkarni et al., 2017a, 2017b, 2022; Pengpid et al., 2013; Mendez-Ruiz et al., 2020; Madhombiro et al., 2020, 2019a; Kamal et al., 2020; Noknoy et al., 2010a; Ng et al., 2020; Kane et al., 2022). All demonstrating statistically significant between-arm differences with one exception. A 3-month pilot study of a MI+CBT intervention delivered by a nurse (Madhombiro et al., 2019a), revealed a significant within-arm difference in alcohol use but failed to show a significant between-arm difference in the AUDIT score. However, the definitive trial of the intervention reported a significant reduction in AUDIT score in the intervention group compared to the control at 6 months post-intervention (Madhombiro et al., 2020). In a psychological intervention delivered by lay counsellors targeting individuals with harmful drinking (defined as a score of 12–19 on AUDIT), remission (AUDIT score <8) was significantly higher in the intervention group compared to the control group at 3 months and 12 months (Nadkarni et al., 2017a, 2017b). Two studies evaluating nurse-delivered screening and BI for individuals who use alcohol showed a reduction in hazardous drinking severity (defined as score of 8–19 on AUDIT) in the intervention group compared to control after 3 months (Kamal et al., 2020). Pengpid et al. reported a more significant reduction in AUDIT score and heavy episodic drinking (defined as consuming 10 g of alcohol or more on a single occasion) in the intervention group compared to the control at 12 months (Pengpid et al., 2013).

An intervention based on a social cognitive model of behaviour change delivered by a nurse showed a significant decrease in AUDIT score and lower alcohol consumption in the intervention group

**Table 1**  
Study Characteristics.

AUTHOR	COUNTRY	SETTING	STUDY DESIGN	SAMPLE AGE AND GENDER	TYPE OF SU/ SUDs	INTERVENTION	CONTROL	OUTCOMES	MEASUREMENT TOOLS	SUMMARY OF FINDINGS	LENGTH OF FOLLOW UP
Aung M. et al. (2019)	Thailand	Primary health care	RCT	35–80 years median age =64 years Sex = males and females.	Cigarette smokers with CVD risk (either diabetes or hypertension)	Smoking cessation service package n=160	Routine health service smoking cessation package. n=159	Smoking cessation.	Self-report. Confirmation by piCo+Smokerlyzer. FTND scores	Smoking cessation improved in both arms; this was significantly higher in the intervention group compared to the control (p<0.001). aOR 2.95 (1.55–5.61). Multiple regression analysis showed intervention had a higher effect on outcome.	6 and 12 months
Chawarski M. et al. (2008)	Malaysia	Community-based outpatient center	Pilot RCT	18–65 years. (Mean age not stated) Sex=males and females	Heroin-dependent individuals.	Enhanced Services= (Behavioural drug and HIV risk reduction counselling (BDRC) and abstinence-contingent take-home buprenorphine (ACB)+ PM. n=12	Standard Services. n=12	Abstinence (2-week aggregated opiate-negative urine tests)	Self-reported Confirmation via Urine toxicology using rapid/instant urine tests.	The proportion of opiate-negative urine tests increased significantly over time during treatment for both groups, p < 0.001), although greater increase in the Enhanced Services than in the Standard Services group (p < 0.05).	12 weeks
Haokip H et al. (2021)	India	De-addiction clinic of a tertiary Hospital	Pilot RCT	19 and 55 years. The mean age in the Intervention group = 54.2 years, control group =52.35 years sex=males and females.	Tobacco users	Video-assisted nurse-led NRT n=41	Routine standard treatment. n=41	Tobacco cessation. Addiction status	Self-reported cross-checked via urine toxicology. IRC Ruler (Importance, Confidence, and Readiness)	A statistically significant difference in changes in addiction status between the intervention group and control. A statistically significant within-group change in addiction status at 2 and 4 weeks (p < 0.001). However, there was a higher reduction in mean scores in the intervention group than in the control group. Significant reduction in urine cotinine levels at 5th week OR: 2.79, CI (1.26–6.18)	2 and 4 weeks.
Jayakrishnan R. et al. (2013)	India	Community settings	Cluster RCT	18–60 years; mean age in intervention arm = (mean age: 44.56 years). Control arm = 44.47 years. Sex=Males	Tobacco users	Multiple approach tobacco cessation intervention n=474	General awareness training on tobacco hazards, along with an anti-tobacco leaflet. n=454	Abstinence Harm reduction	Self-report revised FTND.	Self-reported point prevalence of abstinence at 12-month follow-up was higher in the intervention area compared to the control. RR: 1.85, 95% CI: (1.05,3.25). The quit status at 6	6 and 12 months

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Table 1 (continued)

AUTHOR	COUNTRY	SETTING	STUDY DESIGN	SAMPLE AGE AND GENDER	TYPE OF SU/ SUDs	INTERVENTION	CONTROL	OUTCOMES	MEASUREMENT TOOLS	SUMMARY OF FINDINGS	LENGTH OF FOLLOW UP
Jiang N. et al. (2019)	Vietnam	Community health center	Quasi-experimental	Adults Mean ages= ARM 1= 47.9 years ARM 2=48.4 years. Sex= males and females.	Cigarette smokers and water-pipe smokers,	ARM 2= ARM1 plus a referral to VHW-led 3-session in-person cessation counselling n=781	ARM 1= health care provider advice and cessation assistance (brief cessation counselling and educational materials) n=537	7-day point prevalence smoking abstinence.	In-person survey and CO validation.	months was higher in the intervention area compared to the control (p=0.0001). Overall abstinence rate was significantly higher in ARM 2 than ARM 1 (P<0.001)—a higher quit rate among cigarette smokers than water pipe and dual smokers. AOR = 2.96, CI: (1.78, 4.92),	6 months
Kane J. et al. (2021)	Zambia	Urban public facility	Pilot RCT	>18years, Mean age = 40.2 sex=male and females	Unhealthy alcohol use	BI + Common Elements Treatment Approach (CETA) n=82	BI only n=78	Change in AUDIT score and HIV risk behaviour. Secondary outcome= depression symptoms, trauma symptoms, and non-alcohol substance use.	AUDIT ACASI-ARI CES-D scale, HTQ, ASSIST.	The reduction in mean AUDIT score from baseline to 6-months was statistically significantly greater in the BI plus CETA group compared to BI alone (− 3.2 points, 95% CI − 6.2 to − 0.1) with an effect size of $d = 0.48$ . The intervention group also experienced statistically significantly greater reductions in depression (− 4.2, 95% CI − 8.9 to − 0.5, $d = 0.5$ ) and trauma symptoms (− 0.2, 95% CI − 0.5 to − 0.1, $d = 0.38$ ) than the control. Mean reductions in SSI scores were statistically significantly greater in the BI plus CETA group vs. the BI alone group for cocaine (− 6.6, 95% CI − 12.8 to − 0.5, $d = 0.86$ ) and methamphetamines (− 6.2, 95% CI − 11.9 to − 0.5, $d = 0.81$ ).	6 months
Kamal K. et al. (2020)	India	Co-education college	Doble blind RCT	18–22 years. Intervention mean age =18.98 ± 1.1 years Control mean age =19.0 ± 0.82 years	Student alcohol users	Screening and Brief intervention (BI) n=64	AUDIT Score Feedback +Advice. n=66	Changes in the mean AUDIT score between intervention and control. Secondary outcome= transition from	The self-report version of AUDIT	There was a significant reduction in AUDIT score $p = 0.002$ in the intervention arm compared to the control.	3 months

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Table 1 (continued)

AUTHOR	COUNTRY	SETTING	STUDY DESIGN	SAMPLE AGE AND GENDER	TYPE OF SU/ SUDs	INTERVENTION	CONTROL	OUTCOMES	MEASUREMENT TOOLS	SUMMARY OF FINDINGS	LENGTH OF FOLLOW UP
Martens j. et al. (2014)	S/Africa	Primary healthcare clinic	Parallel group RCT	18–24 years mean age =21, Sex: males and females	Alcohol and drug users	Brief Motivational Intervention (BMI) plus resource list for drinking. n=197	Minimally enhanced usual care (mEUC) plus a resource list. n=206	high risk to the low-risk zone of AUDIT. Reduction in ASSIST score for alcohol and other drugs	WHO ASSIST (Alcohol, Smoking and Substance Involvement Screening Test)	Significant reductions in alcohol ASSIST scores in the BMI arm compared to the mEUC arm (P=0.0293).	3 months
Madhombiro M. et al. (2020)	Zimbabwe	Hospital setting (HIV care)	RCT	18 years, combined mean age =43.3 years Sex= Male and females.	Alcohol users plus HIV	Motivational interview + Cognitive behavioural therapy (MI-CBT) n=108	The WHO mhGAP Intervention Guide for AUDs n=126	Change in AUDIT score. Secondary outcome = Quality of life.	AUDIT tool used as an interview or as a self-report tool. WHO DAS 2	Statistically significant between arm difference in AUDIT score. Mean difference 3.09 (4.53–0.01), p = 0.05). QoL improved in both arms p <0.001 however, no significant between arm differences. (p= 0.51)	6 months.
Madhombiro M. et al. (2019)	Zimbabwe	Hospital setting (HIV care)	Pilot RCT	Age =18 years of age (combined mean age=39.5 years) Sex= Male and females.	Alcohol users plus HIV	MI+ CBT n=20	WHO mhGAP Intervention Guide for AUDs. n=20	Change in AUDIT score. Secondary outcome= quality of life.	AUDIT WHO DAS 2	There was a statistically significant within-arm change in alcohol use over time (P < 0.001); however, there were no statistically significant differences in AUDIT score between the arms (P= 0.70) No change in QoL.	3 months
Mendez-Ruiz M. et al. (2020)	Mexico	Primary Health Care (PHC)	RCT	18 and 30 years mean age= 20.02 Sex= females	Alcohol users	Health, Education, Prevention and Self-Care SEPA. n=66	Conventional treatment. n=66	Decrease in alcohol use.	AUDIT	There was a statistical difference in the post-test measurement in both arms (Mean of SEPA in IG = 1.24 vs Mean of control = 1.70; P < 0.001). The proportion of alcohol consumers in the last 7 days also reduced significantly in the SEPA arm (7.6%) than in the CG (36.4%, p < 0.001).	5 weeks.
Nadkarni A. et al. (2017)	India	Primary health center	RCT	18–65years mean age=(42.3) sex=males.	Alcohol users	EUC plus CAP n=188	Enhanced usual care (WHOMhGAP) n=190	Remission and mean daily alcohol consumption in the past 2 weeks. Secondary outcomes=	AUDIT WHODAS 2 and SIP. Timeline follow-back TLFb.	The proportion with remission was significantly higher in the EUC plus CAP group than in the EUC alone group aPR: 1.50 [95% CI 1.09–2.07] (P=0.01) Significantly higher abstinence in the past	3 months

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Table 1 (continued)

AUTHOR	COUNTRY	SETTING	STUDY DESIGN	SAMPLE AGE AND GENDER	TYPE OF SU/ SUDs	INTERVENTION	CONTROL	OUTCOMES	MEASUREMENT TOOLS	SUMMARY OF FINDINGS	LENGTH OF FOLLOW UP
Nadkarni A. et al. (2017)	India	Primary health center	RCT	18–65years mean age=(42.3) sex=males	Alcohol users	EUC plus CAP n=188	Enhanced usual care (WHO mhGAP) n=190	Disability Percentage of days abstinent (PDA)and percentage of days of heavy drinking Remission and mean standard ethanol consumed in the past 2 weeks. Secondary outcomes =Disability score Intervention effect on PDA and PDHD.	AUDIT WHODAS 2 and SIP. TLFB	14 days in EUC plus CAP than in EUC alone. AOR: 3.00 [1.76–5.13]; p<0.0001) No intervention effect on SIP and WHODAS II score (p=0.32) and PDHD (0=0.88). Significant effect on PDA (p<0.0001) The proportion of remission was significantly higher in the CAP + EUC arm than in the EUC arm [aPR] 1.71 [95% CI 1.32, 2.22]; p < 0.001). Significantly higher abstinence in the past 14 days in the CAP plus EUC arm than in the EUC alone arm AOR: 1.92 [95% CI 1.19, 3.10]; p = 0.008). No intervention effect on SIP score, WHODAS II score. Significant effects on PDA (p=0.001)	12 months
Nadkarni A. et al. (2022)	India	Collages, workplace, community health center	Pilot RCT(3-arm)	18–65 years mean age=32.3) Sex=males and females.	Alcohol users	Arm 1=Mobile-based brief intervention (BI) n=25 Arm 2=Face to face= based on the (Who mhGAP) intervention n=24	Leaflet with information on alcohol consumption and tips to manage and reduce drinking. n=24	Change in PDA. Secondary outcomes: Change in quantity and patterns of drinking PDHD.	TLFB	No significant between-arm difference in change in any of the drinking outcomes. There was a significant within-arm reduction in PDHD (P = 0.02) in face-to-face BI and a within-arm increase in PDA (P = 0.009) in mobile BI. PDHD was lower in face-to-face BI compared to active control (p=0.006) and (p=0.003) in mobile BI compared to active control.	3 months
Noknoy.S et al. (2009)	Thailand	Primary care unit (PCU)	RCT	18 and 60 years, mean age =37 plus or minus 10 years sex=Males	Hazardous alcohol users	Motivational Enhancement Therapy (MET) n=59	Assessment only n=58	The primary outcome was past week's alcohol consumption. The secondary	Health survey questionnaire and GGT	There was a significant reduction in drinking in the intervention arm compared to control (p<0.05). Both groups had low	3 and 6 months.

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Table 1 (continued)

AUTHOR	COUNTRY	SETTING	STUDY DESIGN	SAMPLE AGE AND GENDER	TYPE OF SU/ SUDs	INTERVENTION	CONTROL	OUTCOMES	MEASUREMENT TOOLS	SUMMARY OF FINDINGS	LENGTH OF FOLLOW UP
Ng S. et al. (2020)	India	Mental health setting	Pilot RCT	18 and 60 years mean age =36.47 sex=Males	Alcohol users	Intervention=Body-mind-spirit (BMS) n=30	Treatment as Usual (TAU) n=30	Reduction in craving. Quantity and frequency of alcohol consumption.	Penn alcohol craving scale. 90-AQ quick drinking assessment interview.	alcohol-related consequences, and the differences were not statistically significant. Significant reduction in alcohol use. (p<0.001) less craving and lower relapse rate (P<0.001) in the intervention group compared with the control	1,2, 3 months.
Pengpid S. et al. (2013)	S/Africa	University	RCT	18 years and above mean age= 22.1 sex= (males and females).	Alcohol users	Screening and Brief intervention (BI) n=81	Health education leaflet. n=71	Reduction in alcohol consumption Secondary outcomes: Intervention effects on other substances	Self-reported via AUDIT tool. Self-rated.	There were significant reductions in alcohol consumption (AUDIT score and heavy episodic drinking) across groups. Statistically significant in-between group differences in AUDIT score (p = 0.004) No significant effects on other substances.	6 and 12 months
Papas R. et al. (2021)	Kenya	HIV outpatient clinic	RCT	>18 years mean age=38.9 years. Sex= male	Alcohol users with HIV	Culturally adapted group CBT. n=312	Healthy lifestyle education. (HL) n=302	Percentage of drinking days (PDD) Mean drinks per drinking day (DDD)	Adapted TLFB.	Results showed significantly lower PDD (P= 0.0059 and DDD (P < 0.0001) in the intervention group than in the control group and at all study phases.	9 months
Sorsdahl K et al. (2015)	S/Africa	Emergency Department and community health center	RCT (3 arms)	18 –75 years (mean age=28 years) Sex=males and females.	Substance users	An adapted version of a blended MI-PST. n=112	Control (1) =MI (ASSIST-linked BI) n=113 Control (2) = Educational brochure. n=110	Reduction in ASSIST scores Secondary outcome= Substance-related injury and violence	ASSIST Injury and violence assessed via questions	ASSIST scores at 3 months were significantly lower in the MI-PST group than they were in the MI and the control group (P= 0.04)	3 months
Schottenfeld. R. et al. (2021)	Malaysia	General medical practice clinics	RCT	18 years or more Overall mean age= 38.7 Sex= male	Opioid dependent individuals	Arm 1= PM +Behavioural counselling +ACB n=57 Arm 2=PM +Behavioural counselling n=59	Control (1) =PM only n=58 Control (2) =PM+ACB n=60	Proportions of opioid-negative urine tests. Secondary outcome= reductions in days per week of heroin use and treatment retention.	Immunoassay rapid tests, weekly self-report via TLFB.	The proportions of opioid-negative urine tests during treatment were significantly higher with ACB (p < 0.001) than without and, with behavioural counselling than without (p = 0.001). Numbers of days per week of heroin use were significantly lower with behavioural counselling than without (p< 0.001); the difference with	24 weeks

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Table 1 (continued)

AUTHOR	COUNTRY	SETTING	STUDY DESIGN	SAMPLE AGE AND GENDER	TYPE OF SU/ SUDs	INTERVENTION	CONTROL	OUTCOMES	MEASUREMENT TOOLS	SUMMARY OF FINDINGS	LENGTH OF FOLLOW UP
Takahashi R. et al. (2018)	Kenya	Community	Quasi-experimental study(3-arm)	18-65 years, mean age =44.7 Sex = males and females	Alcohol users	Two arms; 1st arm= ABI only (n=57), 2nd arm= ABI+MT (alcohol brief intervention + motivational talks) n=52	General health information on alcohol. n=52	The difference in mean scores between intervention and control groups. Secondary = low-risk alcohol consumption (AUDIT <8)	AUDIT	versus without ACB was not statistically significant (p = 0.438) Both interventions showed a significant reduction in AUDIT score, with ABI +MT showing greater effects (p < 0.001) while BI only (p < 0.017).	1, 3 and 6 months,

**Abbreviations:** PM=Physician management, ACB= abstinence-contingent buprenorphine-naloxone, AUDs=alcohol use disorders, AUDIT= alcohol use disorders identification test, ASSIST=the alcohol, smoking and substance involvement screening test, SEPA= health education prevention and self-care, GGT=gamma glutamyl transferase, TLFB= timeline follow-back, FTND=fagerstrom Nicotine Dependence test, PDA= per cent days abstinent, PDHD= per cent days heavy drinking, DDD=drinks per drinking day WHO mhGAP=WHO Mental Health Gap Action Programme, WHO DAS=WHO disability assessment schedule, CES-D= Center for Epidemiological Studies-Depression scale, HTQ= Harvard Trauma Questionnaire, SSI= specific substance involvement, ACASI-ARI = audio computer-assisted AIDS risk inventory.

**Table 2**  
Intervention Characteristics.

AUTHOR	TYPE OF NSHWS	TRAINING AND QUALIFICATION	METHOD OF DELIVERY, DURATION AND FREQUENCY	CONTENT OF INTERVENTION	FIDELITY OF DELIVERY
Aung M. et al. (2019)	PHC nurses	Pre-intervention training workshops on assertive communication, motivation-3months	A smoking cessation package. Face to face	Assertive communication monthly to achieve the goal of cessation, education, and family support on motivation “family-assisted smoking cessation diary”. Optional NRT gum.	N/A
Chawarski M. et al. (2008)	Nurses and general practitioners.	Nurses with experience in drug counselling who completed additional training in BDRC consisting of several didactic workshops, case conferences, and three or more closely supervised BDRC practice cases. General practitioner with 3 years of experience in treating patients with SUDs.	A 3x/week PM+ BDRC intervention Duration 45–60 mins Face to face First PM visit duration of 45 min, followed by 10–12 min visits per week throughout the study period.	BDRC plus PM +buprenorphine (3x/ week.): Initial stages of BDRC focus on an educational and behavioural approach to encourage changes necessary to achieve and maintain drug abstinence, cessation/reduction of drug and sex-related risk behaviours and treatment adherence. The early stage focuses on motivation to make initial lifestyle changes through feedback + positive re-enforcement; late-stage links treatment progress with long-term recovery goals.	Adherence to the manual by counsellors was monitored via biweekly supervision sessions with the author of the BDRC manual.
Haokip H et al. (2021)	Registered nurse.		A video-assisted intervention delivered via mobile (WhatsApp messages, sometimes direct calls)	An educational 5 min video created specifically for the intervention in the local language on the epidemiology of tobacco, effects and types used in context and common withdrawal symptoms, the positive impact of quitting and adaptive coping mechanisms to quit tobacco use. Pamphlet with instructions for nicotine gums or lozenges and daily phone reminders sent to the nurse-led group to use nicotine gums/ lozenges and attend follow-up.	N/A
Jayakrishnan R.et al. (2013)	Medical social workers	Trained at the Tobacco Cessation Clinic.	A multiple approach intervention for smoking 4 rounds of counselling (2–4 weeks, and 4–6weeks for 6 months). Duration 15 mins. Initial 2 weeks = group counselling session; subsequent sessions combined individual and telephone.	Behaviour modification: educational materials on tobacco, role modelling against tobacco use in the community. Group counselling against use, individual counselling on coping skills, harm and stress reduction, and social support for quitting.	N/A
Jiang N. et al. (2019)	Healthcare provider and Village health worker (VHW)	4-day training on manual.	A 3-session intervention, duration of 30–40 mins delivered via face-to-face at the participant’s home.	ARM 1= health care provider advice and cessation assistance (brief counselling and educational materials). ARM 2= ARM1 plus a referral to VHW-led counselling focus on education about smoking (pros and cons), coping strategies through role plays and feedback and developing a quit plan.	1-day booster training, a manual packet containing content for each session, handouts with information about topics to be discussed and a checklist for each interaction were provided to enhance fidelity.

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Table 2 (continued)

AUTHOR	TYPE OF NSHWS	TRAINING AND QUALIFICATION	METHOD OF DELIVERY, DURATION AND FREQUENCY	CONTENT OF INTERVENTION	FIDELITY OF DELIVERY
Kane J.C et al. (2021)	HIV peer educators.	Peer educators already embedded at an HIV clinic providing basic services with experience in adherence counselling and outreach programmes. A 10-day in-person CETA training with the peer educators and local supervisors (experienced CETA counsellors).	6–12 sessions of CETA Duration 1-hour weekly. Face-face. The BI consisted of a single 20–30-min session.	CETA is a multi-session transdiagnostic cognitive behavioural therapy approach which consists of the following elements: Engagement, Introduction/ Psychoeducation, Safety, Substance Use Reduction, Cognitive Coping and Restructuring, Problem Solving, Behavioural Activation, Relaxation, and Exposure (Live and Imaginal). It was adapted for use in HIV clinics. The BI content was adapted specifically for the ZCAP study from the CETA element for Substance Use Reduction by authors with input from local HIV care and mental health partners.	Throughout the trial, counsellors met weekly with their supervisor to review cases. Supervision sessions were used to assess and promote fidelity to the CETA manual.
Kamal K. et al. (2020)	Nurse	Online certification for ABI. A psychiatrist did induction and training.	A single session SBI Duration 15–20 mins. Face to face	SBI= Based on the FRAMES model, feedback, motivational approach to intervention, exploration of alternatives for quitting, setting definite action plans with goal-oriented objectives plus educational materials for cutting down use.	Adherence to FRAMES and fidelity were assessed via audio-recording.
Martens j. et al. (2014)	Primary Care Nurse Practitioners.	A 3-day training by an experienced practitioner and trainer in BML.	A single session of Brief Motivational Intervention (BML) + referral. Duration 10 mins Face to face.	BMI was delivered with a resource list for drinking and drug use provided to patients.	Regular supervision meetings (weekly for 6 weeks and monthly after that), audio recordings of interviews were reviewed with the trainer and feedback and support were provided. Recordings were also scored accordingly.
Madhombiro M. et al. (2020)	Registered General nurse.	Trained and supervised by a master's level mental health nurse.	A 10-session intervention delivered in 2 parts Duration 45–60 mins Face to face.	An adapted intervention based on motivational interview and cognitive behavioural therapy (MI-CBT). Components include feedback, exploring motivation for SU, goal setting, coping skills, refusal skills, and education about relapse and future triggers with anticipated challenges. Two extra sessions were delivered at 3 and 6 months for feedback on personal goals for alcohol use.	10% of sessions recorded (audiotapes and notes) Supervision involved feedback on recordings provided to nurses. A review of intervention notes and participant experience was also conducted. The two study teams visited each clinic for two separate days during the first three months of the study to provide supervision sessions.
Madhombiro et al. (2019)	Registered General nurse.	2-day training by psychiatrists, psychologists and a nurse practitioner through roleplay, quizzes and assignments.	A 4-session intervention delivered in 2 parts. Duration 30 mins- 1 hr. Face to face.	Feedback, motivation to build rapport and develop readiness to change, coping skills for cravings and cues, managing faulty thought patterns, dealing with stress and drink refusal skills were developed.	10% of sessions were audio recorded and reviewed with the supervisor and feedback provided during supervision visits. In addition, client evaluation and satisfaction cards were

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Table 2 (continued)

AUTHOR	TYPE OF NSHWS	TRAINING AND QUALIFICATION	METHOD OF DELIVERY, DURATION AND FREQUENCY	CONTENT OF INTERVENTION	FIDELITY OF DELIVERY
Mendez-Ruiz M. et al. (2020)	Nurses	Bachelor's degree and doctorate. 2 months of training by a trained SEPA investigator.	A 3 session (one/per week) Duration 2.5 hours. Face-to-face (groups).	SEPA= Based on the Social Cognitive Model of Behaviour Change. Manuals were adapted to the local context. Women identified models and learned from their experiences practically. Educational materials and guided activities through roleplays, practical demonstration of skills and tasks to be developed in the community and at home. Topics and tasks from the previous sessions were reviewed at the beginning of each session, and feedback was provided.	reviewed with each nurse and concerns identified were discussed and resolved. N/A
Nadkarni A. et al. (2017)	Lay counsellors	Secondary school education but no formal training or qualification in mental health, They were trained through interviews, role plays, and assessments.	A 4-session training delivered in 3 phases, each session Duration 30–45 mins. Face-to-face (telephone sessions when necessary). Face to face.	Psychological treatment, based on motivational enhancement, with added behavioural and cognitive elements. Personalized feedback: development of cognitive and behavioural skills and techniques, coping with drinking challenges such as refusal skills, peer pressure, problem-solving skills, emotion regulation and skills to manage potential relapse.	Fidelity assessed via treatment completion via clinical records of counsellors and audio recordings of sessions during weekly group supervision. Assessment of therapy quality rating of 10% of sessions was done by an expert involved in the development of CAP.
Nadkarni A. et al. (2017)	Lay counsellors	Secondary school education but no formal training or qualification in mental health, They were trained through interviews, role plays, and assessments.	A 4-session training delivered in 3 phases, each session Duration 30–45 mins. Face-to-face (telephone sessions when necessary). Face to face.	Psychological treatment, based on motivational enhancement, with added behavioural and cognitive elements. Personalized feedback: development of cognitive and behavioural skills and techniques, coping with drinking challenges such as refusal skills, peer pressure, problem-solving skills, emotion regulation and skills to manage potential relapse.	Fidelity assessed via treatment completion via clinical records of counsellors and audio recordings of sessions during weekly group supervision. Assessment of therapy quality rating of 10% of sessions was done by an expert involved in the development of CAP.
Nadkarni A. et al. (2022)	Trained researcher	NA	A single session BI, Duration 5–10 mins. Face to face	WHO mhGAP= feedback and interpretation of scores, information on safe drinking limits, social and health risks, exploration of potential pros and strategies to reduce drinking.	NA
Noknoy.S et al. (2009)	Nurse	A single 6-hour training.	A 3-counselling session of MET. Duration 15 min. Face to face.	Adaptation of MI from project MATCH. It involves evaluating the ability to change drinking habits according to stages of change, empathic counselling, and goal setting tailored to participants' stage of change.	N/A
Ng S. et al. (2020)	BMS certified practitioner.	Certified practitioner.	A 7- session BMS intervention	A holistic approach focused on the	N/A

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Table 2 (continued)

AUTHOR	TYPE OF NSHWS	TRAINING AND QUALIFICATION	METHOD OF DELIVERY, DURATION AND FREQUENCY	CONTENT OF INTERVENTION	FIDELITY OF DELIVERY
Pengpid S. et al. (2013)	Research assistant nurses.	A 5-day training workshop through role play and general skills techniques.	Duration 60–90 mins Face to face (Groups of 3–4).  A single session SBI duration of 20 mins. Face to face.	relationship between mind, body and spirit. (Concept of holistic health, problems related to alcoholism, emotions and well-being related to alcohol intake, emotional regulation, self-love and acceptance, support network and relapse prevention. (Theme and topics for group sessions were tailored to suit participants' needs). Feedback on scores, health education leaflet, simple advice, plus brief counselling on reducing alcohol intake (identifying challenges and problem-solving skills to overcome them)	About 10% of the brief intervention sessions were observed for adherence to the counselling protocol by an external staff.
Papas R. et al. (2021)	Paraprofessional counsellors	A 2-year post-high school counselling diploma. The training was via roleplaying and videotaped feedback.	A 6-session culturally adapted group CBT. Duration 90 minutes. Face-to-face.	CBT=Adapted to context, aimed at developing coping skills, education on alcohol and HIV was provided, reasons for drinking and plans for quitting were explored, risks and consequences for drinking, problem-solving skills and refusal skills were covered.	Interviews were recorded and reviewed for accuracy; Sessions were videotaped and reviewed with the supervisor.
Sorsdahl K et al. (2015)	Peer counsellors	Bachelor's level education. An 18 h training by an MI- certified trainer plus proficiency testing. 12 h training in PST.	A 5-session adapted version of a blended MI-PST intervention, Duration 45–60 mins. Face to face.	Assessment and feedback, education on alcohol and its consequence, developing and practising skills to address life's problems through homework, motivational approach to elicit positive change and affirmation of commitment to change.	Counsellors had a checklist to ensure all aspects of the intervention were provided. Bi-weekly supervision and debriefing sessions. 3 half-day booster sessions to limit intervention drift.
Schottenfeld. R. et al. (2021)	Mid-level nursing healthcare professionals and general physicians.	3 of the nurses had taken part in the pilot trial. New counsellors had a multi-day training workshop composed of didactic lectures, interactive discussion sessions, video demonstrations, role-playing exercises, live patient demonstrations and case discussions. Physicians received didactic training required for certification to prescribe buprenorphine-naloxone.	PM sessions initially weekly, then every 2 weeks for 4 weeks, and finally every 4 weeks. Initial PM session lasted 30 minutes subsequent visits, 10–15 minutes and the final session lasted for 15–40 minutes. face to face. Counselling was weekly one-to-one sessions lasting 45–60 minutes per session for 24 weeks.	Individualized educational and behavioural modules consisting of side-effect of psychoactive substances and opioid disorder, adherence, and the role of buprenorphine-naloxone in recovery. Behavioural modules focused on improving adherence, making changes supportive of successful recovery.	The study investigators maintained regular contact with the physicians throughout the study to maintain fidelity and adherence to the treatment manual and address any questions or concerns. Ongoing supervision was provided by the local supervisor through video teleconferencing, with study investigators, refresher on-site training workshops were provided to counsellors approximately once per year to maintain fidelity and adherence to the manual and maintain proficiency and consistency in the provision of counselling.
Takahashi R. et al. (2018)	Community health workers (CHWs)	Secondary school education. 6 days of training from	ARM 1 = ABI (3 sessions of duration 5–20 mins) ARM2= ABI + MT (ABI	ABI= based on the FRAMES model (feedback, responsibility, advice,	Fidelity was assessed by reviewing the records kept by the

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Table 2 (continued)

AUTHOR	TYPE OF NSHWS	TRAINING AND QUALIFICATION	METHOD OF DELIVERY, DURATION AND FREQUENCY	CONTENT OF INTERVENTION	FIDELITY OF DELIVERY
		professional health workers consisting of roleplays and one-day field practice.	sessions+ 2 MT sessions) ABI sessions were delivered one-to-one in private, and MT was delivered in a group format.	menu, empathy, and self-efficacy) MT= motivational speakers covered topics around their experience with drinking, challenges (health and economic impacts), and their journey and life during and post quitting.	CHWs and the MT attendance sheets.

**Abbreviations:** N/A= not available, NRT=nicotine replacement therapy, BDRC=behavioural drug and risk reduction counselling, PM= physician management, ABI=alcohol brief interventions, SBI=screening and brief intervention, FRAMES=feedback, reflective listening, advise, menu of options, MET=motivational enhancement therapy, MI=motivational interview, BMS=body-mind-spirit, CBT=cognitive behavioural therapy, PST=problem solving therapy, MT=motivational talks, CETA= Common Elements Treatment Approach.

compared to the control group at 5 weeks post-intervention (Mendez-Ruiz et al., 2020). A three-arm study assessing the effectiveness of an ABI +MT intervention delivered by community health workers reported a significant reduction in AUDIT score in both intervention groups compared to the control at 1,3 and 6 months post-intervention (Takahashi et al., 2018). Although a more significant reduction was observed in the ABI + MT group, no clear superiority of one intervention over the other was found when both interventions were compared. Furthermore, a study evaluating intervention effects on drinking outcomes indicated that in a MET intervention delivered by a nurse, drinking outcomes, such as quantity and frequency, were reduced in the intervention group compared to the control at 3 and 6 months (Noknoy et al., 2010a). Additionally, a culturally adapted CBT intervention delivered by counsellors showed a significant reduction in the percentage of drinking days and mean drinks per drinking day in the intervention group compared to the control at 9 months (Papas et al., 2021). In a relapse prevention intervention provided by a holistic practitioner, the intervention group demonstrated a significant decrease in the use of alcohol, craving, and a lower relapse rate compared to the control at 1,2, and 3-months post-intervention (Ng et al., 2020). Finally, Kane et al. reported a significant reduction in mean AUDIT score in the intervention group compared to the control at 6 months (Kane et al., 2022).

### 3.3.2. Tobacco

Four studies focused on smoking cessation (Jiang et al., 2019; Aung et al., 2019; Jayakrishnan et al., 2013; Haokip et al., 2021). They all reported superior effects of interventions on outcomes in the intervention groups compared to controls. Three of the studies used multi-smoking cessation interventions (Jiang et al., 2019; Aung et al., 2019; Jayakrishnan et al., 2013). A significant between-arm difference in the outcome (i.e., smoking cessation) was reported in the intervention delivered by village health workers for people who smoke tobacco. However, when analyzed by smoker type, the intervention effect seemed higher in those who smoke cigarettes than in people with water-pipe dual smoking (Jiang et al., 2019). Additionally, an intervention delivered by social workers showed that the rate of quitting in people who use tobacco was significantly higher in the intervention group compared to the control (Jayakrishnan et al., 2013). A within-arm improvement in smoking cessation was reported in a multi-component package delivered by a nurse. The intervention group showed greater superiority than the control group at 12 months (Aung et al., 2019). Lastly, the only video-assisted pilot RCT delivered by a nurse showed significant improvement in importance and readiness to quit tobacco use at 2- and 4-week follow-up (Haokip et al., 2021).

### 3.3.3. Opioids

A pilot study (Chawarski et al., 2008) assessed the effectiveness of a nurse-delivered multi-component intervention for people who use

opioids, including pharmacotherapy and behaviour modification through psychoeducation and counselling. They demonstrated a significant reduction in opiate use in both groups, with the intervention group showing superior effects than the control at 12 weeks. The definitive trial (Schottenfeld et al., 2021) also reported significant increase in opioid abstinence in both intervention groups compared to the controls at 6 months post-intervention.

### 3.3.4. Other substances

Two studies focusing on other substances (including alcohol) (Sorsdahl et al., 2015; Mertens et al., 2014) reported significant intervention effects on primary outcomes compared to the control groups. A single brief intervention delivered by nurses for people who use alcohol and other drugs reported a significantly higher reduction in the primary outcome, i.e., ASSIST scores in the intervention group compared to the control group (Mertens et al., 2014). In a three-arm trial, MI+PST delivered by peer counsellors for people who use substances found that the primary outcome (i.e. ASSIST score) was significantly lower in the MI+PST group compared to the MI and control group at 3 months post-intervention (Sorsdahl et al., 2015).

## 4. Discussion

This review summarizes and synthesizes the evidence on task-sharing interventions for SU and SUDs in LMICs. Our review contributes to the current body of knowledge by addressing a gap in our understanding of the role of NSHWS and the diverse methodologies employed in delivering SU and SUDs interventions in LMICs. This is particularly significant given the limited access to treatment in these settings. We aimed to shed light on effective strategies that leverage the capabilities of NSHWS, thereby, providing valuable insights for the improvement of SU and SUDs services and accessibility in LMICs.

Currently, there is limited evidence on task-sharing interventions for SU and SUDs especially in LMICs. A review by Satinsky et al (Satinsky et al., 2021) focused on peer-delivered interventions, and another by Van Ginniken et al (van Ginneken et al., 2021) reported positive effects of the interventions on SU and SUDs outcomes. Similar to our finding, both reviews highlighted methodological limitations in the included studies. Despite the fact that our review had more studies with a low to moderate risk of bias in certain domains (e.g., randomization and the selection of reported results), it is crucial to acknowledge the existence of biases associated with the use of self-reported outcome measures in these studies, which may have introduced a source of subjectivity. Furthermore, limitations arising from insufficient information in some studies may have impacted the overall reliability of the finding in this review.

The primary outcomes of the studies noted in this review were substance use reduction, abstinence, and in one case, relapse prevention.

Most behavioural therapies utilized in the studies, such as MI, BI, and CBT, demonstrated substantial impacts on SU and SUDs outcomes. However, significant differences between studies impeded the ability to compare interventions across studies as well as draw conclusions regarding important intervention characteristics linked with improved outcomes. Additionally, the superiority of one over another could also not be determined. Furthermore, a number of studies in our review did not report effect size, thereby limiting our ability to quantitatively assess and compare the magnitude of effect across interventions. Likewise, the heterogeneity with respect to interventions, study participants, assessment tools, follow-up periods and outcomes measured impeded the ability to perform a meta-analysis.

Overall, multiple sessions delivered via face-to-face interactions, individually or in groups, were utilized in most studies (Jiang et al., 2019; Takahashi et al., 2018; Papas et al., 2021; Aung et al., 2019; Nadkarni et al., 2017a, 2017b; Sorsdahl et al., 2015; Mendez-Ruiz et al., 2020; Madhombiro et al., 2020, 2019a; Jayakrishnan et al., 2013; Noknoy et al., 2010a; Schottenfeld et al., 2021; Chawarski et al., 2008; Ng et al., 2020; Kane et al., 2022). This approach is relevant in establishing rapport between participants and delivery agents because it permits more in-depth interactions. This finding is consistent with a previous review, which suggested that NSHWs delivering interventions in this manner could mediate outcomes (Singla et al., 2017). In addition, personalized feedback, psychoeducation through counselling or providing educational materials, motivation, problem-solving skills, and coping skills were featured the most in these studies. These approaches could be the drivers of the positive effects reported in this review.

The robustness of training and supervision of NSHWs and intervention fidelity have been identified as crucial factors in determining the success of interventions (Kohrt et al., 2015). These steps have been documented in most of the selected studies within this review. Fidelity was evaluated in many ways, including supervision, checklists, and feedback on recordings. Additionally, the significance of adequate dose, intensity of training and supervision are acknowledged in majority of the studies included in the review. Baseline NSHW training of varying frequency and duration and ongoing supervision at different time points were also reported, with roleplay being the most used method.

A notable example is the study by Nadkarni et al., (Nadkarni et al., 2017b; Nadkarni et al., 2017a) which demonstrated that lay counsellors with only secondary school education and no prior training in mental health could deliver effective SU and SUDs interventions with robust and adequate training. In the study, NSHWs were selected as delivery agents only after passing an assessment on intervention knowledge and skill. Training occurred in stages, including interviews; additionally, intensive training was delivered through role plays and competency assessments, all under specialist supervision.

In several studies, the cultural adaptation of intervention content, and tailoring of intervention to user needs may have significantly influenced the outcome (Papas et al., 2021; Aung et al., 2019; Mendez-Ruiz et al., 2020; Schottenfeld et al., 2021; Ng et al., 2020; Kane et al., 2022). For instance, Aung et al., (Aung et al., 2019). demonstrated that incorporating locally available resources, such as trained family members, and adapting intervention components to users' preferences enhances sustainability and motivation to quit. Moreover, Schottenfeld et al., tailored counselling sessions to address the specific challenges faced by individuals in their treatment process (Schottenfeld et al., 2021). Similarly, Kane et al., (Kane et al., 2022) not only considered the participants' preferences in selecting the intervention delivery location but also adapted their intervention for use within an HIV center in their study. Furthermore, Jiang et al., found that, people who smoke cigarette benefitted more from the intervention compared to people with water pipe smoking (Jiang et al., 2019). This difference may be attributed to the intervention manual primarily focusing on cigarette smoking rather than encompassing all forms of tobacco use. This further underscores the significance of tailoring the interventions to the context and diverse SU populations.

The inclusion of studies that reported outcomes at different time points provided insights into the potential long-term impact of interventions. This was demonstrated in the study by Nadkarni et al. which showed stability in treatment effect over time and increased remission rates for people with heavy drinking at 12 months compared to the effect at 3 months (Nadkarni et al., 2017a; Nadkarni et al., 2017b). It was also the only study in the review that demonstrated the cost-effectiveness of delivering SU and SUDs interventions by NSHWs from a health services perspective. The evaluation concluded that while the psychological treatment (CAP plus EUC) was associated with additional costs, these were offset in the long run by a lower rate of healthcare service utilization. This finding is significant for LMICs because it illustrates the potential socio-economic and healthcare benefits of allocating scarce resources to more cost-effective interventions delivered in primary care centers.

#### 4.1. Limitations

Our review faced several limitations that warrant consideration. Firstly, the heterogeneity among the studies impeded the possibility of conducting a meta-analysis, and the lack of reported effect sizes in certain studies posed a challenge in ascertaining the overall effect size. This, in turn, hindered the ability to provide a quantitative summary of the interventions' impact. Another noteworthy limitation stems from the exclusion of studies that lacked full texts, potentially leading to the omission of relevant information. Our decision to restrict the search to studies published in English may have further limited the inclusivity of our analysis, as studies from non-English-speaking countries may have been inadvertently excluded.

Due to the broad scope of SU, categorizing outcomes based on SU and SUDs would have enhanced our review. However, we were unable to undertake the task due to time constraints. Furthermore, a majority of the studies included in our review relied on self-reported outcome measures, which may have subjected findings to the influence of recall and social desirability bias. Additionally, some studies had inadequate reporting of methodological processes such as deviations from intended interventions, which impacted the assessment of risk of bias. Lastly, because most studies had follow-up durations < 12 months, whether these intervention effects were sustained over time is unclear.

#### 4.2. Conclusion

Our review underscores the growing interests in task sharing interventions for SU and SUDs, utilising NSHWs in LMICs, where access to these services is limited. Additionally, our finding also indicates that, with proper selection, training, and competency assessments, NSHWs can be effectively utilized to deliver interventions to people with substance use and substance use disorders in LMICs.

Given the limitations noted in this review, we recommend that researchers consider the potential impact of these limitations when interpreting the results of our review.

The variation in intervention characteristics posed a difficulty in determining the specific active components responsible for mediating the treatment effects reported in the studies. As a result, further research is recommended to determine which combinations might be effective and appropriate for the various substance-use populations. Furthermore, there is a need to investigate the impact of context on these interventions, i.e., barriers and facilitators in order to design effective, culturally sensitive, and sustainable interventions that can address the unique challenges relevant to LMICs. Economic evaluations of interventions should also be included in trials to inform policymakers of the expected resource implications and financial feasibility of interventions, which is essential for scaling up interventions in LMICs. Given that most studies had a duration of <12 months which limited the ability to determine the long-term effects of interventions and their impact on secondary outcomes, future trials should aim to evaluate



these through follow-up of cohorts to obtain insights on these effects. Finally, to mitigate the impact of social desirability bias resulting from self-reported outcome measures, researchers should incorporate biological markers that are sensitive to varying levels of substance use in future trials.

### Contribution of authors

AN conceptualized the idea for the study. AA and AM searched, screened the articles and extracted the data. AN provided guidance on the extraction process and checked the data. The manuscript was drafted by AA and reviewed by AN and AM.

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### CRedit authorship contribution statement

**Hassan Asmau Abba:** Formal analysis, Methodology, Software, Writing – original draft, Writing – review & editing. **Nadkarni Abhijit:** Conceptualization, Supervision, Validation, Writing – review & editing. **Ibrahim Abba:** Methodology, Writing – original draft, Writing – review & editing.

### Declaration of Competing Interest

We declare no conflict of interest by any authors.

### Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.drugalcdep.2024.111093](https://doi.org/10.1016/j.drugalcdep.2024.111093).

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