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Depressive symptoms, alcohol, and drug dependence among female sex workers in Kisumu, Kenya: A cross-sectional study

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Abstract

Female sex workers (FSW) have increased likelihood of depressive symptoms, alcohol and drug dependence. Analysis of cross-sectional baseline data from 407 women in a trial of menstrual cups was done to assess depressive symptoms (PHQ-9), alcohol (AUDIT) and drug dependence (DAST). Multinomial logistic regression identified factors associated with having 2 or 3 elevated scores, relative to having no elevated score. Median age was 27.3 years; 60% of the FSWs had less than secondary education, 41% had other jobs besides sex work, and over half (52.9%) reported experiencing sexual abuse during childhood. The prevalence of depressive symptoms was 20% (15% mild, 5% moderate or higher). One quarter (25%) of participants had some classification for alcohol dependence, and 15% were classified as having potentially hazardous drug dependence. Multiple problems were identified in 14.4% of participants. The results highlight the interconnectedness of mental health, drugs and alcohol use among FSWs in western Kenya. *(Afr J Reprod Health 2026; 30 [14]:75-85).*

Keywords: Female sex workers; depressive symptoms; Alcohol and drug dependence

Résumé

Les travailleuses du sexe (TDS) présentent une probabilité accrue de symptômes dépressifs ainsi que de dépendance à l'alcool et aux drogues. Une analyse de données transversales de référence, recueillies auprès de 407 femmes participant à un essai sur les coupes menstruelles, a été réalisée pour évaluer les symptômes dépressifs (échelle PHQ-9), la dépendance à l'alcool (test AUDIT) et la dépendance aux drogues (test DAST). Une régression logistique multinomiale a permis d'identifier les facteurs associés à l'obtention de deux ou trois scores élevés, par rapport à l'absence de score élevé. L'âge médian était de 27,3 ans ; 60 % des TDS avaient un niveau d'instruction inférieur au secondaire, 41 % exerçaient une autre activité professionnelle en plus du travail du sexe, et plus de la moitié (52,9 %) ont déclaré avoir subi des abus sexuels durant leur enfance. La prévalence des symptômes dépressifs s'élevait à 20 % (15 % légers, 5 % modérés ou sévères). Un quart (25 %) des participantes présentaient un niveau de dépendance à l'alcool classé comme tel, et 15 % étaient classées comme présentant une dépendance aux drogues potentiellement dangereuse. La présence de problèmes multiples a été relevée chez 14,4 % des participantes. Ces résultats mettent en évidence l'interdépendance entre la santé mentale et la consommation d'alcool et de drogues chez les TDS de l'ouest du Kenya. *(Afr J Reprod Health 2026; 30 [14]: 75-85).*

Mots-clés: Travailleuses du sexe ; symptômes dépressifs ; dépendance à l'alcool et aux drogues

Introduction

Sex work is sexual activity with the intent to generate financial benefit.[1] It is prohibited in most countries of the world.[2,3], and its criminalization creates harsh working conditions that put female sex workers (FSWs) at greater risk of violence and poor mental health.[4] Criminalization and stigmatization of sex work compromises FSW safety and strips them of legal protections, jeopardizing their fundamental human rights.[5]

Women often enter sex work due to economic hardship, limited employment opportunities and as a means to support themselves and their household.[6] In sub-Saharan Africa, women are reported to turn to sex work due to loss of a partner, harmful gender norms and lack of support from immediate family members.[7] Moreover, harsh

working conditions leave many FSW facing a range of intersecting challenges including poverty, limited access to education and health care, substance use and heightened HIV risk. [8] Additionally, sex work is often characterized by imbalanced power dynamics, wherein FSW are unable to negotiate condom use, fall into alcohol and drug dependence, and suffer violence or lack of payment from male clients.[9]

Depression and other mental health disorders are increasingly recognized as a consequence of FSWs' involvement in sex work.[10,11] A meta-analysis of 17 studies with 17,581 FSWs reported the prevalence of suicide and depressive symptoms at 44% (95% C.I. 35-54%).[10] Depressive symptoms have been reported to lead FSWs to take alcohol and drugs to cope with life stressors.[12] In the Maisha Fiti study in Nairobi, Kenya, 56% of FSWs enrolled exhibited depressive symptoms and alcohol and drug dependance.[7] These mental health burdens exacerbate alcohol and drug use and other high-risk behaviors. Coupled with increased sexual health risks, these challenges can create a complex and overlapping burden on FSWs' overall well-being.[9] In one analysis of 6,085 FSWs in LMICs, 13.5% reported moderate depression with 4.0% suffering from severe depressive disorder, 20.3% exhibiting harmful alcohol use, while 34.7% were classified as alcohol-dependent. [8] Another study reported FSWs engaged in sex work when intoxicated to help alleviate their fears.[13] FSWs have a higher likelihood of receiving a diagnosis of substance addiction within the past year following being involved in sex work.[14]

Female sex workers often face marginalization and discrimination which restricts their access to healthcare and essential services.[15] Data to inform the development of targeted programs and services for FSWs remain limited in part, due to the stigma and discrimination they often encounter when seeking care within formal health systems.[16,17] Consequently, FSWs' specific health needs and challenges are underrepresented in research and neglected in policy and programming, hindering the delivery of responsive and inclusive health interventions.[18]

This study examined the correlation between depressive symptoms and hazardous alcohol and drug use, and associated factors given their frequent co-occurrence among FSWs and the critical need to inform integrated comprehensive approaches to clinical care. [9,19,20] We hypothesized that depressive symptoms and alcohol and drug dependence among FSWs would be positively associated.

Methods

This analysis of cross-sectional baseline survey data is from a single-arm trial conducted among FSW in western Kenya, described elsewhere.[21] All participants provided written informed consent in the language of their choice (English, Kiswahili and Dholuo). The study was carried out at the UNIM Research and Training Centre in Kisumu, Kenya, and enrolled 407 FSWs. Participants were recruited from Kisumu Central Subcounty by 8 peers from the Kisumu Sex Workers Alliance and Keeping Alive Societies Hope, two community-based organizations that support FSWs in Kisumu, Kenya. The peers were also FSWs who recruited participants from hotspots such as bars, brothels, lodges and guest houses. The FSWs were approached by these peers, and they willingly agreed to come to be part of the study. To be eligible, participants had to be aged 15 – 35 years, reported having sex for money in the past 3 months, reported having menses in the last two months, and not have an intrauterine device (IUD) as a means of family planning at the time of enrolment. All eligible participants provided informed consent and were enrolled in the study. A sample size of 402 participants was sought to be able to detect a 20% decrease in occurrence of BV between the control and intervention phases, and a 1% serious adverse event rate with 80% power.

An interviewer-administered survey was used to collect data in the participants' preferred language (English, Kiswahili, Dholuo). The survey included questions on socio-demographics (e.g., age, level of education, and marital status), sex work characteristics (e.g., duration of sex work, number and type of clients), childhood experience of abuse, and economic indicators (income apart from sex work, food insecurity, etc.). All the FSWs were reassured of confidentiality, and the interviews were done privately. To assess depressive symptoms, the Patient Health Questionnaire (PHQ-9) was used whereby scores ≥ 5 was considered mildly elevated or higher.[22]

The PHQ-9 had a series of nine questions and responses were scored and analyzed according to published recommendations. The AUDIT (Alcohol Use Disorders Identification Test) tool was used to measure potentially harmful or alcohol use, with a cut off scores ≥8 indicating moderate risk.[23] The AUDIT tool had a total of 10 questions with scores of zero to 4 on each question. For drug and substance use, Drug Abuse Screening Tool (DAST) with a total of 10 questions, was used with a cutoff value ≥3 reflecting potentially harmful drug use.[24,25] Unwanted childhood experiences were measured using the Childhood Experience of Care and Abuse (CECA) questionnaire.[26]

Statistical analysis

In this cross-sectional analysis, we conducted two analyses: (1) assessing the correlation between depressive symptoms, alcohol and drug dependency, and (2) identifying factors associated with syndemic psychosocial outcomes (elevated depressive symptoms, hazardous alcohol use, and drug use). Syndemic conditions are those that represent clustering of two or more health conditions, and consideration of their adverse interactions or joint conditions that exacerbate these clustered or conditions.[27,28] Understanding the correlation of health outcomes and whether they share similar features is important for developing interventions that may address multiple outcomes at the same for enhanced effectiveness.[29] In the first analysis, to explore the relationship between psychosocial variables, we estimated the correlation of psychometric variables. To identify factors associated with increased burden of intersecting challenges, we used multinomial logistic regression. For each elevated score (PHQ-9 ≥5, AUDIT ≥ 8, DAST ≥3), participants were assigned one point, summing to a range of 0 (no elevated scores) to 3 (all scores elevated). To reduce sparsity, we combined participants with 2 or 3 elevated scores, and outcomes were modeled as 2 or 3 elevated scores and 1 elevated score, compared to no elevated scores (reference). In multivariable analysis, models were adjusted for variables associated with outcome at the $p<0.10$ in bivariate analysis, with minimized Akaike Information Criterion used to aid final model selection. Statistical analyses were conducted using Stata/SE 17.0.

Ethical consideration

Participants gave informed consent to participate in the study. The informed consent was adhered to without coercion. All participants were taken through informed consenting procedures in their language of choice (English, Dholuo and Kiswahili) and illiterate participants had impartial witnesses who were their peers or anyone at the research center who were not part of the study. The POWWeR Health study was approved by National Commission for Science, Technology and Innovation – NACOSTI/P/24/3300, Jaramogi Oginga Odinga Teaching and Referral Hospital and Technology – ISERC/JOOTRH/718/23 and Jaramogi Oginga Odinga University of Science and Technology – ERC/5/03/2025, Rush University Medical College (IRB1-22040505), and received favorable opinion from Liverpool School of Tropical Medicine (LSTM, 22-076). All study procedures were carried out according to the university, local, national and international guidelines and regulations.

Results

From 8th February 2023 to 25th September 2023, we enrolled 407 women aged 15-35. The mean age of participants was 27.3 years, and 40.0% had attained at least secondary school education. Economic vulnerability was observed, with 11.5% reporting missing a meal in the past week due to lack of money. More than half (52.9%) reported experiencing sexual abuse during childhood. The mean age of entry into sex work was 21 years, and 69.7% reported having a non-paying male sexual partner. Participants reported a median of 10 male clients in the past 7 days (IQR: 5–18), and 17.9% experienced clients refusing to pay on two or more occasions in the past six months. Nearly one quarter (24.6%) of participants were HIV positive **(Table 1).**

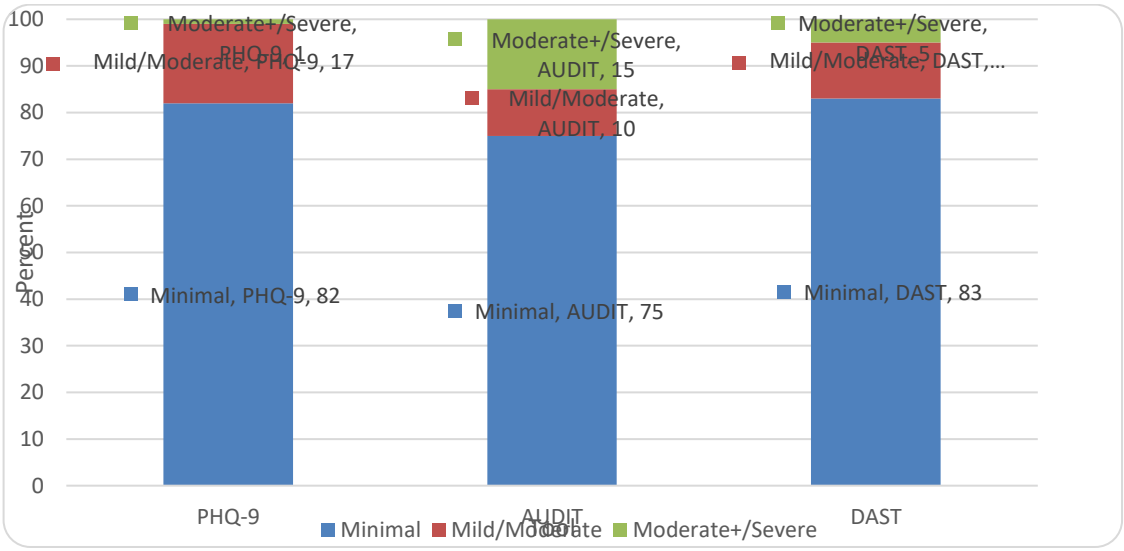
Depressive symptoms, alcohol use, and drug use

The majority (80%) of participants reported no depressive symptoms, while 15% reported mild depressive symptoms. A few (5%) reported moderate to high depressive symptoms. Three quarters (75%) of participants' responses indicated low-risk alcohol use, while moderate or severe

Table 1: Distribution of participant characteristics

	N=407 n (%)
Median age in years (IQR)	27 (23 – 30)
Educational Attainment: Secondary school or more	163 (40.0)
Missed a meal in the past week due to lack of money	47 (11.5)
Earns income outside of sex work	169 (41.5)
Income earned in past one month	
< 5,000 KES (~$40 USD)	32 (8.1)
5,000 - <10,000 KES (~$40 - < $80 USD)	164 (41.7)
>10,000 KES (~>$80 USD)1	197 (50.1)
Sexual abuse as a child	215 (52.9)
Currently have a non-paying male sex partner	284 (69.7)
Median age at which began sex work (IQR)	16 (14-17)
Known HIV positive	100 (24.6)
Median number of male clients, past 7 days (IQR)	10 (5-18)
Clients refused payment 2 or more times in the past 6 months	73 (17.9)

[1] Includes n=14 participants earning >$195



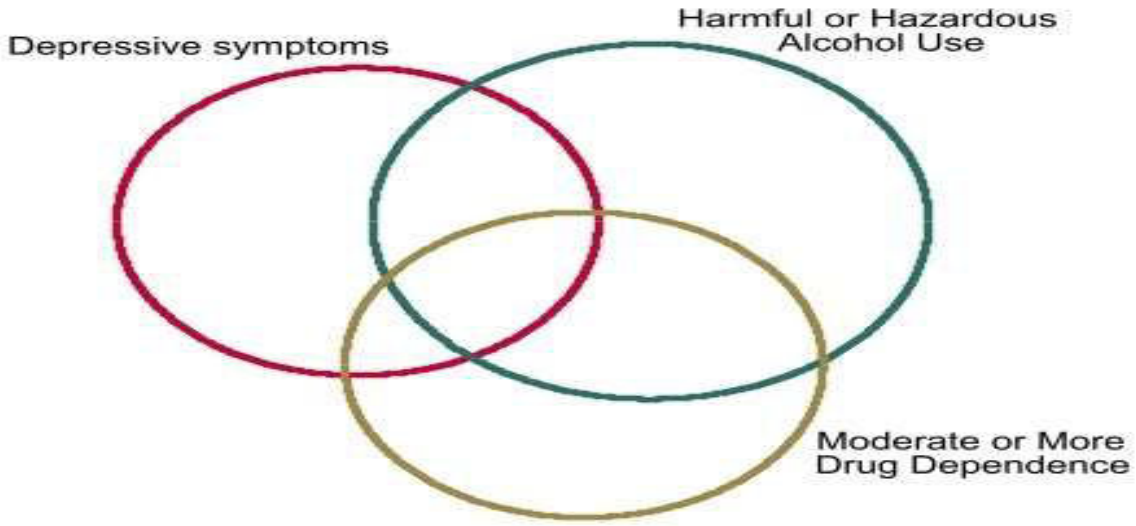
Legend: The figure illustrates the distribution of cutoff scores for depression (PHQ-9), alcohol use (AUDIT), and drug use (DAST) among participants, categorized using standard clinical thresholds. For PHQ-9, the majority scored within the minimal range (0–4), followed by mild (5–9), and a small proportion in the moderate or greater range (10+). AUDIT scores were predominantly minimal (0–7), with notable proportions in the moderate (8–15) and severe (16+) categories. Similarly, DAST scores were largely minimal (0–2), with fewer participants falling into moderate (3–5) and substantial (6+) risk categories.

Figure 1 : Distribution of scores for depressive symptoms, and alcohol and drug dependency among FSW in Kisumu, Kenya

scores were assigned to 15% and 10% of participants respectively. Up to 80% of the participants reported no drug use in the past year, 17.5% had a DAST score of 3 or higher **(Fig 1)**

Co-occurrence of depressive symptoms, and hazardous alcohol and drug use

Nearly all (n=404, 99.3%) participants had codable scores on all 3 scales (i.e., no missing or refused



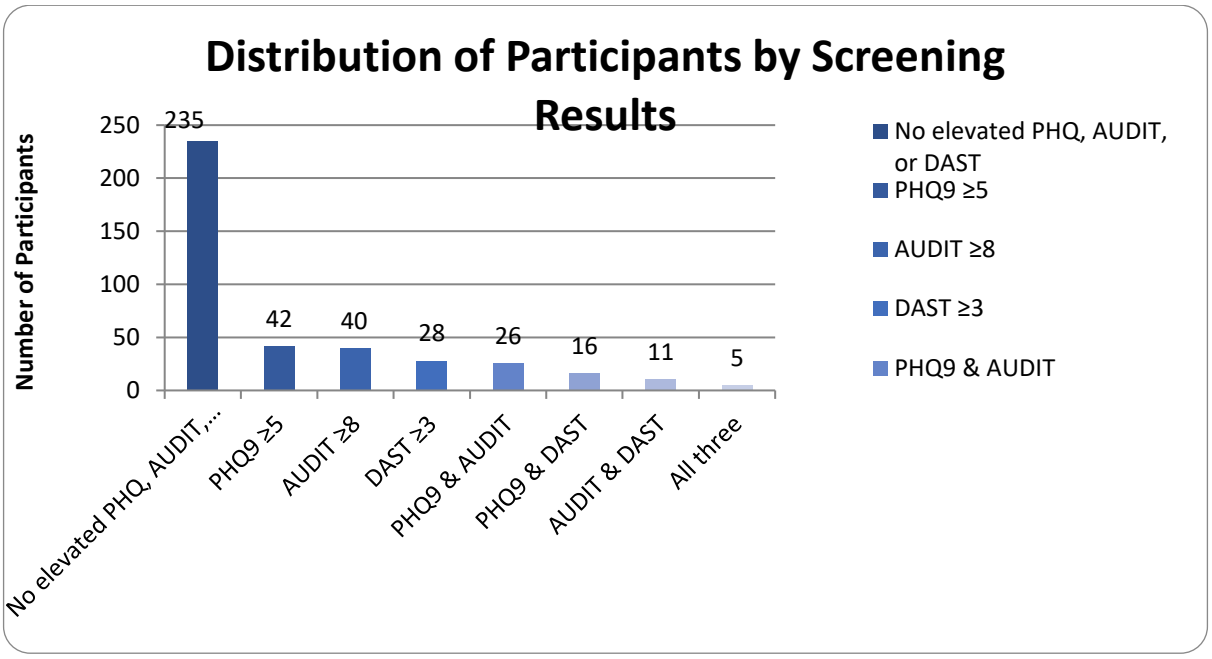
Legend: This Venn diagram illustrates the interconnected nature of depressive symptoms, hazardous alcohol use, and moderate or greater drug dependence among FSWs. The overlapping areas highlight how these conditions co-exist, underlying the syndemic pattern observed in this population

Figure 2: Overlap of elevated Depressive Symptoms, Harmful/Hazardous alcohol use and Moderate or more drug dependence among participants

Table 2: Distribution of characteristics by single or intersecting challenges

Variable	No Challenges, N=235 n (%)	One Challenge, N=110 n (%)	2 or 3 Challenges, N=58 n (%)	P-value
Median (IQR) age in years	26 (23-30)	28 (23-31)	26.5 (23.8-32)	0.407
Secondary school or more	101 (43.2)	38 (35.5)	21 (36.2)	0.468
Missed a meal in the past week due to lack of money	15 (6.4)	12 (10.9)	19 (32.8)	<0.001
Earns income outside of sex work	109 (46.2)	43 (39.1)	15 (25.9)	0.015
Income earned in past one month				0.728
<5,000 KES (~<$40 USD)	19 (8.1)	7 (6.4)	6 (10.3)	
5,000-<10,000 KES (~$40 - <$80 USD)	93 (39.6)	51 (46.4)	23 (39.7)	
>10,000 KES (~>$80 USD)[1]	123 (52.3)	52 (47.3)	29 (50.0)	
Sexual abuse as a child	33 (14.0)	21 (19.1)	22 (37.9)	<0.001
Currently have a non-paying male sex partner	164 (69.5)	78 (70.9)	38 (65.5)	0.770
Median (IQR) age at which began sex work	16 14-16)	15 (14-15)	15 (13-15)	0.007
Known HIV positive	55 (23.4)	26 (23.6)	19 (33.9)	0.245
Median number of male clients, past 7 days (IQR)	10 (4-18)	10 (5-15)	14.5 (5-20)	0.117
Client refused payment 2 or more times in the past 6 months	31 (13.2)	27 (24.6)	17 (29.3)	0.003

[1] Includes n=14 participants earning >$195



Legend: Figure 3 shows the intersections of elevated scores for depressive symptoms, alcohol and drug use, with the rows of the matrix corresponding to the status, and the vertically connected lines to the intersections between these statuses. The number of participants observed in the intersection is shown in the bar with the number of participants labelled (y-axis and each bar).

Figure 3: Upset plot showing intersection between AUDIT, DAST and PHQ9

values): 58.4% with no elevated scores, 27.2% with one elevated score (meaning depression OR hazardous alcohol drinking OR hazardous drug use), and 14.4% with 2 or 3 elevated scores.

Participants were distributed across various combinations of elevated scores **(Figure 2)**, with 42 participants having elevated depression scores (PHQ-9 ≥ 5), 40 with elevated alcohol use scores (AUDIT ≥ 8), 28 with both elevated PHQ-9 and AUDIT scores, and 26 with both PHQ-9 and DAST elevations. Only 5 participants had simultaneously elevated scores for depression, alcohol, and drug use.

Factors associated with intersecting challenges

The distribution of participant characteristics by the number of challenges are shown in **Table 2**. Of the childhood experience of abuse variables, only the variable related to sexual abuse as a child was significantly associated. Of financial variables, receiving financial support from boyfriend, family, or friends was not associated with outcome, nor was amount of income in past month, or the amount of money paid by client at last sex act. Having children, and the number of children was not associated **(Fig 3).**In multivariable adjusted multinomial regression **(Table 3)**, FSW who missed a meal in the past 7 days due to lack of enough money had nearly 5-fold increased prevalence ratio of having two or three psychosocial challenges (aPR = 4.95, 95%: CI: 2.27 -10.8), and those with childhood experience of sexual abuse were close to 3 times more likely to report multiple challenges (aPR =2.71 95% CI: 1.36 – 5.42).

Notably, those with work outside of sex work were 56% less likely to report having multiple challenges. The only factor that was identified with having one problem as compared to no problems was having clients who refused payment two or more times in the past six months.

Table 3: Results of crude and multivariable multinomial regression: factors associated with single or intersecting challenges

Reference is no challenges	**Crude Analysis**		**[1]Multivariable Adjusted, N=403**	
	One challenge (vs. no challenges) (95% CI)	**2 or 3 challenges (vs. no challenges) (95% CI)**	**One challenge (vs. no challenges) Adjusted PR (95% CI)**	**2 or 3 challenges (vs. no challenges) Adjusted PR (95% CI)**
Missed a meal in the past 7 days due to not enough money	1.80 (0.81 – 3.98)	7.15 (3.35 – 15.2)[a]	1.36 (0.59 – 3.14)	4.47 (1.96 – 10.2)[a]
Earns income outside of sex work	0.74 ().47 – 1.18)	0.40 (0.21 – 0.77)[a]	0.78 (0.49 – 1.25)	0.44 (0.22 – 0.87)[a]
Experienced sexual abuse as a child	11.7 (2.51 – 54.1)[a]	27.3 (5.85 = 127)[a]	9.54 (1.95 – 46.6)[a]	15.7 (3.11 – 79.2)[a]
Client refused payment 2 or more times in past 6 months	2.14 (1.20 – 3.80)[a]	2.73 (1.38 – 5.39)[a]	1.81 (1.00 – 3.28)[b]	1.54 (0.72- 3.27)
Number of sex partners in the past 7 days	1.00 (1.00 – 1.01)	1.01 (1.00 – 1.02)[a]	1.00 (0.99 – 1.01)	1.01 (1.00 – 1.01)[a]

Discussion

This analysis sought to evaluate the intersection between depressive symptoms, alcohol and drug use in a cohort of FSW, recognizing that these experiences often do not occur in isolation and are embedded within broader social and economic realities We found that one in five FSWs enrolled in this study exhibited symptoms of depression, one in four women reported moderate to severe alcohol use, and 17.5% of FSWs reported moderate to severe drug use. Across the cohort, 27.2% of FSWs experienced either depression, or hazardous alcohol or drug use, with an additional 14.4% of women exhibiting more than one concurrent psychosocial challenge. Importantly, our findings suggest that these challenges are not merely individual level conditions but are shaped by both early life adversity and ongoing socioeconomic pressures. Childhood sexual abuse and recent food insecurity were strongly associated with multiple intersecting problems. These findings underscore that the mental health and substance use challenges faced by FSWs are substantial and shaped by both early-life adversity and current socioeconomic pressures. For many FSWs, substance use and psychological distress may reflect attempts to cope with difficult life circumstances including violence, stigma and economic instability.

In a systemic meta-analysis by.[8] 24,940 FSWs in 26 LMICs were included where 41.8% had depression. Similar trend was reported in the Maisha Fiti study in Nairobi, Kenya, where 56% of 1003 FSWs enrolled in the study had depressive symptoms due to the nature and environment of sex work compounded by dependence on alcohol and drugs.[7] In our assessment, 20% of FSWs reported elevated depressive symptoms, which was less than the 44% depression rate in another assessment of FSW in Kenya.[30] Depressive symptoms have been reported as common within the sub-Saharan African context, with 33% of 459 FSW screening positive for depression in eThekwini, South Africa.[31] and 40.9% of 300 FSWs enrolled in a study in Uganda.[32] The comparatively lower prevalence observed in our study may reflect differences in study populations, measurement tools, or contextual factors, including access to support services. Nonetheless, even at this level, the burden remains significant and warrants sustained attention.

In our assessment, 25% reported using drugs, and among those using drugs, a notable subset (15%) had potentially hazardous drug use. This is similar to a study of 40 FSW in Nairobi, where 16.9% had harmful cannabis use and 21.5% used amphetamines.[33] This finding underscores the importance of multifaceted interventions and harm reduction among sex workers.[34] Additionally, future studies should incorporate rigorous methods and standardization, as prior studies have used varying time frames, failed to specify drugs being used, amount of alcohol consumed, and failing to differentiate between general and harmful use of both.[33,35,36] At the same time, variations in how substance use is measured across studies point to the need for greater methodological consistency in future research

A key contribution of this study is that it identified frequent co-occurrence of mental health and substance use issues, where 14.4% of participants had 2 or 3 problems. Given the co-occurrence of social and health risk factors that reinforce one another throughout life, it is crucial to examine FSW use of alcohol and other drugs using a syndemic framework as these hazards are interrelated. Participants who missed a meal in the past week due to lack of enough money had an increased likelihood of potential harmful use of alcohol and drugs. Multi-sectoral approaches that acknowledge how structural issues such as poverty, housing instability, and stigma often coexist with health risks are necessary to successfully serve FSWs who are experiencing food insecurity. More significant and long-lasting solutions may result from addressing these overlapping problems collectively as opposed to separately.[37,38] Due to the cross-sectional nature of this study, it is unknown whether intersecting depressive symptoms, alcohol or drug abuse preceded financial insecurity or vice versa. However, studies have demonstrated that poverty alleviation measures such as cash transfers, microfinance, and other interventions can lead to improved mental health outcomes.[34,39] Integrating such approaches within programs targeting FSWs may offer more sustainable and holistic benefits.Our analysis identified factors associated with having

one challenge, or multiple challenges, in comparison to having no challenges, and observed an increased likelihood of intersecting depressive symptoms, alcohol or drug dependence among those with childhood experience of sexual abuse (aPR = 2.71; 95% CI: 1.36 – 5.42), highlighting the need for mental health support, as reported in a meta-analysis and systemic review that identified the pervasive outcome that exposure to adverse childhood experiences can impact negatively in adult life.[40] Factors such as limited access to accurate health information, experiences of social stigma, the presence or absence of supportive social networks, and perceptions of healthcare quality significantly shape sex workers' decisions and ability to seek medical care.[41] From our findings, these patterns reinforce the notion that while most FSWs may not present with any elevated symptoms of depression, a notable proportion exhibits single or multiple risk factors, underlining the importance of integrated screening and treatment approaches in clinical and community settings.

Strengths and limitations

A key strength of this study lies in the use of validated tools to assess depressive symptoms, and drug and alcohol dependence, and novel exploration of how these intersect. Based on results of these screening tools, participants were referred to appropriate support centers within Kisumu town. However, as it was outside the scope of the study, we could not assess whether participants accessed or benefited from the services offered. Additionally, given the sensitive nature of mental health and substance use, there is a possibility that some participants may have underreported their experiences, which could influence the accuracy of the findings.

Implications for policy and Practice

The findings from this study highlight that mental health challenges and substance use among FSWs are not isolated issues but are shaped by economic hardship, trauma, and social marginalization, often serving as coping mechanisms rather than individual failings, thus requiring more compassionate, integrated, and context-sensitive responses. At the policy level, there is a need to strengthen the integration of mental health and substance use services within existing sexual and reproductive health and HIV programs, including routine screening for depressive symptoms, alcohol, and drug use, supported by clear referral pathways and accessible, stigma-free care that prioritizes dignity and confidentiality. Overall, multi-sectoral collaboration is essential to deliver holistic, inclusive, and sustainable improvements in health and wellbeing.

Conclusion

The results of this study point out the syndemic nature of mental health and substance use among FSWs, pointing to the importance of a comprehensive, multi-faceted approach to health interventions in this population, especially addressing childhood trauma and the conditions of poverty and prolonged duration of sex work. Additionally, research on FSWs mental health care should seek to embrace a more holistic perspective to explore not only their barriers and needs around depressive symptoms and alcohol and drug dependence, but also actively including the voices of female sex workers from low-income countries, whose experiences are often overlooked.

Conflict of interest

None to be declared

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Data availability

Data will be made available upon reasonable request to principal investigators (FO, PPH, SDM) upon completion of main trial analysis and with ethical approvals.

Contributions of authors

Edyth Atieno Osire, Shehu Shagari Awandu, Supriya Mehta and Fredrick Otieno conceived, designed original draft, methodology, review and editing. SM: Funding acquisition, review and editing, data curation, data analysis. Pennelope Phililips-Howard Writing - Review and editing. Garazi Zulaika: Data curation, data analysis, Writing - review and editing. Cynthia Akinyi: Investigation. All authors read and approved the final manuscript.

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