Substance Use and Its Correlates among Healthcare Workers in a Teaching and Referral Hospital in South Western Kenya: A Cross-Sectional Study

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Abstract

BACKGROUND

Substance use has increased over time across different population groups. Between 1990 and 2010 the global burden of disease from mental health and substance use disorders (SUDs) increased by 37.6%. Healthcare workers are predisposed to substance use disorders and experience abuse and misuse of substances just like the general population increasing absenteeism and decreasing productivity. This study sought to establish the prevalence and correlates of substance use among healthcare workers in a teaching and referral hospital in South-Western Kenya.

METHODOLOGY

A quantitative cross-sectional analytical study was conducted at Kisii Teaching and Referral Hospital, involving healthcare workers within the hospital in 2023. Data were collected using a self-administered Modified WHO Model-Core-Questionnaire and were analysed using Stata™ v14 with descriptive statistics while further analysis was done with multivariate regression analysis. Approval for ethics was obtained from JOOTRH's ISERC.

RESULTS

The sample size was 237. The study respondents' mean age was 32.4 (SD 8.3) years with 51.90% being female. The lifetime prevalence of any substance use was 47.68% (95% CI 41.12-54.24%, n = 113), cigarette smoking 9.75% (n=23), alcohol 36.29% (95% CI 30.16%-42.76%), cannabis 8.44% (95% CI 5.23-12.73%), other opiate-type substances 10.97% (95% CI 7.29-15.66%), tranquillizer 3.80%, sedative-hypnotics 2.11%, amphetamine 4.24%, hallucinogens 0.84%, heroin 1.69%, cocaine use 2.11%, volatile inhalants 1.27% while it was 2.97% for injecting drug use. Current use for cigarettes was 4.66%, alcohol at 15.61%, 6.33% for other opiate-type drugs, and cannabis at 2.1%. Being male (aOR 1.46, 95% CI 0.79-2.72)), having more assets (aOR 1.25, 95% CI 0.28 – 5.57), and having a master's degree (aOR 3.17, 95% CI 0.23 – 44.3) were associated with higher odds of substance use while being married (aOR 0.26, 95% CI 0.04 – 1.56), having more children (aOR of 0.77 (95% CI 0.54 – 1.11) and > 10-year experience (aOR 0.54, 95% CI 0.12 – 2.47) had lower odds.

CONCLUSION

Substance use prevalence among the respondents was higher compared to other similar populations in Kenya and globally. Being male, having a master's degree and having more assets were associated with higher odds while being married, having more children and having more than 10 years of professional experience had lower odds of substance use.

Keywords*: Substance Use, Healthcare Workers, Prevalence, Correlates*

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Background

Substance use is any consumption of alcohol or drugs, which may by itself, not be a problem or it can lead to abuse or dependency on the substance in some people, [1] whereas substance use disorder is a cluster of cognitive, behavioural, and physiological symptoms indicating that the individual continues using a substance despite significant substance-related problems [2]. Alcohol and drug use contribute to untoward consequences on countries' economies, health, productivity, and social aspects of communities [3]. Target 3.5 of the SDGs specifically requires countries to focus on enhancing preventative and treatment options for abuse of substances, including abuse of narcotic drugs and detrimental alcohol use hence the need to know the burden and the correlates [4].

Between 1990 and 2010 the global burden of disease from mental health and substance use disorders (SUDs) reportedly increased by 37.6% [5]. The United Nations Office on Drugs and Crime estimated people who suffer from substance use disorders were thirty-five million. In 2017, 5.5% (estimated 385 million) of the population aged 15-64 years globally were estimated to have consumed drugs in the preceding year [6]. In the same year, around 53.4 million people had used opioids, 56% more than the 2016 estimates. Opioids contributed to two-thirds of the 585,000 deaths due to drug use that year. Globally, 11 million people injected drugs that same year, of which 1.4 million were HIV infected and 5.6 million with hepatitis C [6].

Healthcare Workers (HCWs) are not immune to substance use disorders and experience abuse and misuse of substances just like the general population. This misuse and abuse of substances increases absenteeism and decreases productivity, which is particularly concerning in LMICs where HCWs to offer health services are scarce [7].

Psychoactive substances and alcohol are used in all the regions of Kenya, including both urban and rural areas [8-9], with the current use of cannabis, tobacco, and alcohol among 15 to 65-year-olds estimated to be 1.6%, 6.8%, and 9.7% respectively in 2022 by NACADA [10]. The use of *Khat* or *Miraa* was similarly estimated at 2.6% in Kenya [10]. In another study by Jaguga et al, 43.9% of harmful alcohol use at the start of the COVID-19 pandemic by healthcare workers was reported [11]. Additionally, the substance use's overall lifetime prevalence was 42.8% in Nepal [12] which was high, meaning that over 4 in 10 people had used a psychoactive substance in their lifetime.

The use of substances among healthcare workers and students jeopardizes professional standards of quality services, potentially putting the public at risk [13]. Use, often begins during adolescence and in college [14-16], and early starters have an increased risk of psychosocial problems, such as behaviour patterns, mental disorders, breakdown of family systems, peer relationship strains, recreation, and work maladjustment [17]. A good number of studies have focused on healthcare students and the general population with few focusing on adult healthcare workers, especially in LMICs. The substance use prevalence among healthcare students ranges from 5-67% [18-24], with developed countries like the US reporting higher percentages (67%) [17].

Medical professionals often suffer from extreme work responsibilities, physical pain, sleep deprivation, fatigue, and other work-related stress stemming from constant exposure to illness, death, and trauma. Like many people outside their profession, this may lead them to turn to drugs or alcohol as a form of coping mechanism and self-medication with negative effects on their health and their work. A negative view of a physician hurts the provider-patient relationship and hinders patient actions such as following care plans [13].

Prevention and treatment efforts continue to lag in most parts of the world, with only 14%

of people with disorders of drug use receiving treatment each year [6]. In developing countries like Kenya, the availability of homemade brews which are cheap propagates uncontrolled alcohol use and is especially risky as these brews frequently contain methanol at toxic levels [25].

This study followed a request from the hospital's management Board to establish the burden and correlates of the use of substances among healthcare workers in the hospital to institute preventative measures depending on the findings thereof. Thus this study sought to establish these among healthcare workers at Kisii teaching and referral hospital in South-Western Kenya.

Methodology

Study design, site and population

The study employed a quantitative cross-sectional analytical study design. All the staff except the casual workers working at the hospital (623) were eligible for recruitment and were included in the sampling frame. We conducted the study at Kisii Teaching and Referral Hospital (KTRH), a level 5 hospital in the South Western region of Kenya that serves over eight million people in its catchment population including neighbouring counties and upper parts of Tanzania [26]. The study population comprised the healthcare workers working at KTRH (over 600 healthcare workers).

Determination of sample size

Daniel's formula for calculating the sample size for a study with a finite population (Finite Population Correction (FPC)) was used [27] to obtain the study sample size and was determined to be 226. Sampling was done using a stratified random sampling method with the stratification based on staff cadres.

Data collection

We collected anonymized data in May and June 2023 with a self-administered modified World Health Organization (WHO) Model Core Questionnaire using a drop-and-pick method by trained research assistants. Data collected included socio-demographic data (age, gender, education, designation, and marital status), work experience, number of children, substance use, the person who introduced the study participant to use, the cause of the use, money used daily to obtain the substance, whether use caused any dysfunction in daily life, and what those effects were and also what assets type the person owned (e.g. mobile phone, car, land etc). The different asset-type numbers owned were used to generate a crude wealth index for analysis.

Data were then entered, and saved in password-protected databases using MS Excel. Only key research staff had access to this data.

Data analysis

The data were then exported and analyzed using STATA ™ Version 14. Tables, Charts, graphs, and figures were used for presentation while descriptive statistics with medians, means, standard deviations, and ranges were utilized. We did more advanced statistical analysis with multivariate logistic regression.

Ethical approval

The ethical approval was obtained from Jaramogi Oginga Odinga Teaching and Referral Hospital Ethics Review Committee number IERC/JOOTRH/595/22. Informed consent was obtained from the study participants before data collection and privacy and confidentiality of all data observed.

Results

Two hundred and fifty questionnaires were distributed to the study population with 237 participants completing and returning them giving a response rate of 94.8%. The mean age was 32.4 (SD 8.4) years while almost two-thirds were married. Almost half were nurses. Table 1 summarizes the respondents' demographic data.

Lifetime prevalence of substance use

The lifetime prevalence of any substance use within the study population was 47.68% (95% CI 41.12 – 54.24%, n = 237) meaning that

half of the study participants had taken any of the substances under study. The male study respondents had a higher lifetime prevalence of any substance use at 54.39% compared to the female study participants (41.46%). Participants aged 30-39 years had the lowest lifetime prevalence of 44.19% (n=38) followed by those who were aged 50 years and above at 45.45% (n=5).

The respondents aged 29 years and younger had the highest lifetime prevalence of substance use at 49.52% (n=52) followed closely by those aged between 40 and 49 years at 48.48% (n=16). This is depicted in the Lowess graph in Figure 1 indicating two peaks in prevalence.

Cigarette smoking

The lifetime prevalence of cigarette smoking among the respondents was 9.75% (n=23). The current use of cigarettes was 4.66%, (n=11). The average age of starting to smoke was 19.87 (SD 5.13) years and a median of 20 years. The mean age at first smoking was highest amongst the administrative staff at 26 years while it was lowest amongst the rehabilitative staff at 12 years of age. The diagnostic staff, doctors, and nurses had comparable ages at first smoking of 20, 18.6, and 19.57 years, respectively. Close to four percent (3.80%, n=6) of respondents had a spouse who smoked cigarettes contributing to secondary smoking exposure.

Table 1:
Table Showing the Study Respondents' Demographics

Variable		Results	
Age in years (Mean, SD)		32.4(8.3)	
Age Groups in years (%, n)	20 – 29	44.68(106)	
	30 – 39	36.60(87)	
	40 – 49	14.04(33)	
	50 Years and Above	4.68(11)	
Gender (%, n)	Male	48.1(114)	
	Female	51.90(123)	
Marital Status (%, n)	Married	59.57(140)	
	Single	34.89(82)	
	Separated	1.70(2)	
	Living as a couple	3.83(9)	
Cadre (%, n)	Doctor	8.86(21)	
	Nurse	48.1(114)	
	Clinical Officer	12.7(30)	
	Administrative Staff	11.4(27)	
	Diagnostic Staff	5.1(12)	
	Rehabilitative Staff	1.67(4)	
	Others	12.24(29)	
Education Level (%, n)	O'Level	0.42(1)	
	Certificate	3.34(8)	
	Diploma	48.31(114)	
	Degree	43.64(103)	
	Masters	4.24(10)	
	No. of Children (mean, SD)	1.58(1.57)	
	No. of Assets (mean, SD)	2.31(1.36)	
	Years of Experience (%, n)	Life	KTRH
	< 1 Year	27.54(65)	42.8(102)
	1-5 Years	31.36(74)	35.17(83)
	6 – 10 Years	22.46(53)	11.02(26)
	> 10 Years	18.64(44)	11.02(26)

Alcohol intake

The lifetime prevalence of alcohol intake was 36.29% (95% CI 30.16% - 42.76%, n=86). The average age of first taking alcohol was 21.02 (SD 5.72, 95% CI 19.76 - 22.29) years and a median age of 21 years. The mean age of first alcohol intake was lowest among the nurses at 9.75 years while it was highest in the administrative staff at 22.5 years of age, hence nurses on average started taking alcohol the earliest followed by the doctors at 12.6 years. The point prevalence of alcohol intake was 3.38%. Five percent (5.49%, (n=13) of the participants had had an alcoholic drink less than a year ago but more than one month ago. Almost fifteen percent (14.77%, n=35) had had an alcoholic drink more than a year ago.

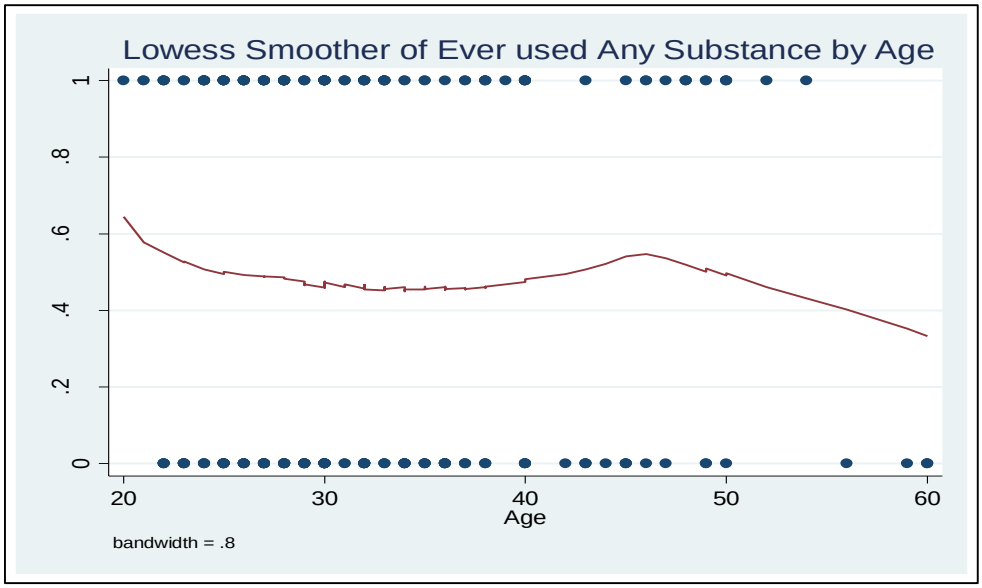

Figure 1:
Lowess Smoother Graph showing the Distribution of Substance Use by Age

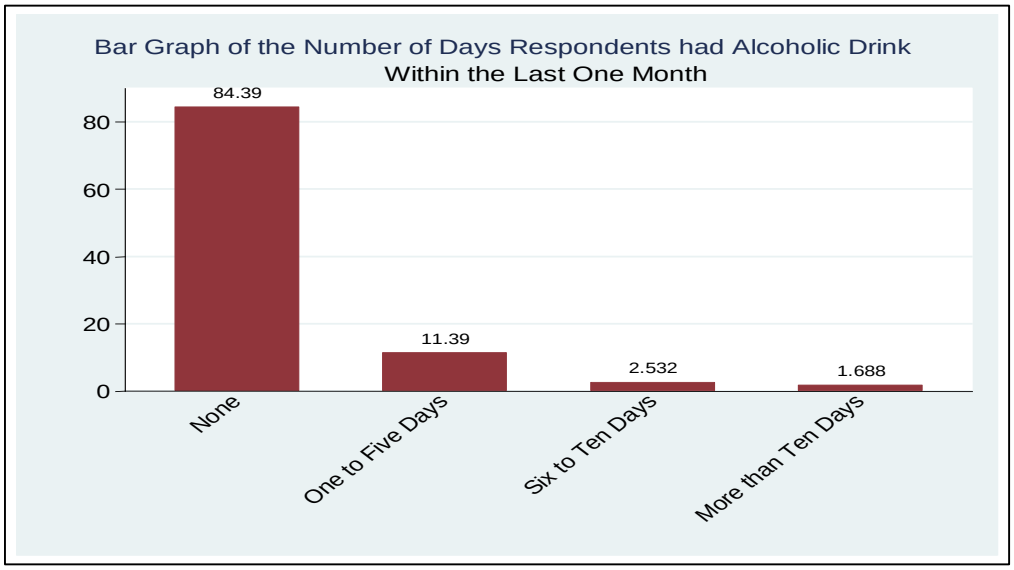

Figure 2:
Bar Graph showing the No. Of Days that a Study Participant had had Alcohol within the Previous Month

The average number of days that a respondent who had alcohol within the last month had alcohol was 5.13 (SD 5.38) days. These number of days were grouped as shown in the bar graph (Figure 2) and 11.39% (n=27) of the respondents had had an alcoholic drink between one and five days with 2.53% (n=6) having alcohol between six to ten days while 1.69% (n=4) had alcohol more than ten days ago within the month. This indicated that 15.61% of participants were current alcohol consumers.

The average number of drinks that the respondent had per sitting was 2.85 (SD 2.32) with a median of two and an IQR of 10 drinks. In the preceding month, 6.33% (n=15) of the study participants had 5 or more drinks in a row once. Almost two percent (1.69%) of the study participants had 5 or more drinks in a row three to five times while 0.84% (n=2) had 5 or more drinks in a row six to nine times, indicative of heavy consumers.

Cannabis

The lifetime prevalence of cannabis consumption was 8.44% (95% CI 5.23 - 12.73%, n=20) within the study population. The average age of first use of cannabis was 21.52 (SD 4.49) years, with a median of 20 years. Close to three percent (2.95%, n=7) of the participants took cannabis in the preceding 12 months, while 2.1% were current users of cannabis. One percent (1.26%) had consumed cannabis within the previous five days while 0.84% had consumed it within twenty or more days in the reported month. The main reported modes of consumption were smoking (5.06%) and both smoking and eating (0.84%).

Opium and other opiate-type drugs

No study participants reported ever consuming opium. However, the lifetime prevalence of the other opiate-type substances was 10.97%, (95% CI 7.29 - 15.66%, n=26).

Table 2:
Table Showing a Summary of the Other Substances Used

Substance	Lifetime prevalence (%, n)	Current use (%)	Age at first intake in years (Mean, SD)	Modes of Intake	Main Types Taken
Tranquillizers	3.8(9)	2.96	27(17.12)	Eating/swallowing - 2.53% and injecting - 0.84%	Alprazolam and diazepam/valium
Sedative Hypnotics	2.1(5)	0.42	25.4(4.51)	Eating/swallowing	Phenobarbitone
Stimulants/ Amphetamines	4.24(10)	1.69	20(4.58)	Eating/chewing - 0.42% and Eating/swallowing - 2.54%	*Miraa*/*Khat*
Hallucinogens	0.84(2)		26.5(2.12)	Eating and swallowing - 0.42%, Suckling under the tongue - 0.42%, and Smoking - 0.42%	
Cocaine	2.11(5)	0.84	22(2.64)	Drinking - 0.42% and Sniffing - 0.42%	Powder
Heroin	1.69(4)	1.69	19(9.54)	Drinking - 0.42% and Eating/swallowing - 0.84%	
Volatile Inhalants	1.27(3)	1.26	19(1.41)	Fumes - 0.42% and sprays - 0.42%	
Injecting Drug Use (IDU)	2.97(7)	0.42		1.27% used a needle after someone else had used the same needle while 0.85% had shared a needle they had used with someone else (sharing of needles)	

Over six percent (6.33%, n=15) were current users. The average age of first consuming these opiates was 23 (SD 8.84) years and the median age of 20 years. Five percent (5.06%, n=12) of the respondents reported having used opiates within the previous year with 4.64% reporting using them within the previous one to two days. The reported opiates taken included cough syrup (codeine) at 5.06%, morphine and pethidine at 1.69%, and tramadol at 0.42%. The modes of consumption included eating/swallowing at 7.17% (n=17) and injecting at 0.84% (n=2). The burden of other substances used by the study participants was summarized in Table 2.

Substance use initiator

A majority of the participants reported that they were introduced to substance use by a friend (11.02%, n=26) with 3.81% (n=9) being introduced by a colleague. Two respondents (0.85%) reported having been introduced by a parent and one (0.42%) each was introduced by a sibling and other relatives respectively.

What causes a person to use the substance

Five percent of participants (4.66%) reported that the major reason for using the substances was a desire to experiment while 3.81% used them to relax whereas 2.54% used them to relieve stress. Five study respondents (2.12%) reported using the substances to be accepted by peers with four respondents (1.69%) using them to cope with their problems.

Average cost of obtaining substances

Almost 10% (9.01%, n=21) of respondents spent Kshs. 500 (approx. 4 USD) or less to obtain the substances daily with 5.58% (n=13) of the respondents utilizing between Kshs 1,001 and 2,000 and 5.15% (n=12) using between Kshs 501 and 1,000 daily to obtain the substances. Two respondents (0.86%) utilized between 2001 and 5,000 shillings to obtain the substances while one person (0.43%) utilized more than 5,000 shillings daily to obtain the substances. This is summarized in the bar graph (Figure 3).

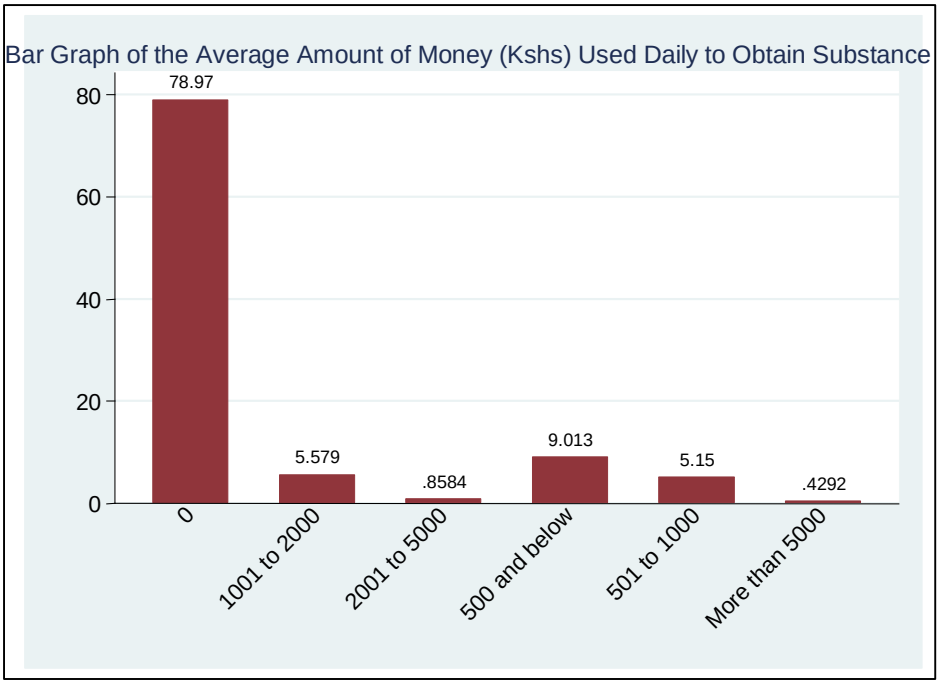

Figure 3:
Bar Graph showing the Average Amount of Money in Kshs. Used Daily to Obtain Substance

Non-prescribed substance use leading to daily dysfunction

Six percent (5.93%, n=14) of the respondents reported that the use of the substance without a prescription caused dysfunction in their daily activities of life. Five respondents (1.69%) had symptoms of moderate substance use disorder (four to five symptoms) while two (0.84%) had symptoms of severe substance use disorder (six and above symptoms) based on DSM 5 Classification.

Correlates of use of substances

Table 3 shows the main correlates of substance use. Males were associated with increased odds of using substances with an aOR of 1.46 (95% CI 0.79-2.72) compared to the female respondents. Compared to the administrative staff, all the other cadres except those classified as others had increased odds of using substances. Those with the highest odds were the rehabilitative staff with an aOR of 2.99 (95% CI 0.21–42.3).

Having a master's degree had higher odds of using a substance with an aOR of 3.17 (95% CI 0.23–44.3). Compared to those with one to five years of professional experience, those with less than a year's experience (aOR 1.21, 95% CI 0.44 – 3.31) and those with between six to ten years' experience (aOR 1.22, 95% CI 0.46–3.21) had higher odds of using substances. Having more asset types was also associated with increased odds of using substances with those who had three to four assets having an aOR of 1.52 (95% CI 0.71–3.25) while those who had five to six assets had an aOR of 1.25 (95% CI 0.28–5.57) when compared to those with one to two assets.

Table 3:
Table Showing the Correlates for Substance Use

Variable		Adjusted OR	95% Confidence Interval	
Age		0.99	0.94	1.06
Crude Wealth Index	One to two Assets			
	Three to Four Assets	1.52	0.71	3.25
	Five to Six Assets	1.25	0.28	5.57
Gender	Female			
	Male	1.46	0.79	2.72
Designation Group	Administrative staff			
	Doctor	1.40	0.32	6.07
	Clinical Officer	1.07	0.29	3.92
	Nurse	1.69	0.59	4.76
	Rehabilitative Staff	2.99	0.21	44.3
	Diagnostic Staff	2.34	0.46	11.9
	Others	0.81	0.21	3.19
Education Level	Certificate			
	Masters	3.17	0.23	44.3
	Degree	0.78	0.10	5.87
	Diploma	0.89	0.12	6.99
Marital Status	Separated			
	Single	0.32	0.05	2.01
	Married	0.26	0.04	1.56
Professional Experience	1 to 5 Years			
	Less than 1 Year	1.21	0.44	3.31
	6 – 10 Years	1.22	0.46	3.21
	More than 10 Years	0.54	0.12	2.47

Those with more than 10 years of professional experience (aOR 0.54, 95% CI 0.12–2.47), were married (aOR 0.26, 95% CI 0.04–1.56) when compared to those who were separated, and those who had more children (aOR 0.77 95% CI 0.54–1.11) had lower odds of substance use. There was no associated change in the odds of using any substance by age.

Discussion

The substance use lifetime prevalence at KTRH was higher in our study compared to what is reported in other places and similar populations. The lifetime prevalence of 47.68% was higher compared to what was reported in a similar study in Nepal of 42.8% [12]. In Australia, estimates of substance abuse, misuse, and addiction rates among nurses reportedly ranged from 14 – 20% as per the State Boards of Nursing National Councils [28], again showing the findings of the current study to be higher in comparison.

Lifetime prevalence seemed to be highest among the youngest population which was probably driven by the desire to experiment as reported by study participants. The study also showed this prevalence dropped in those in their thirties before rising for those in their forties and then dropping amongst those in their fifties. Consequently, there were two discernible peak ages for substance use prevalence i.e., among the young and those in their forties. The reason for the peak among those in their forties was not explored but could be postulated to be due to the availability of financial resources to obtain the substances and also an increase in family and other social stressors.

The lifetime prevalence of alcohol consumption was 36.29% at KTRH which was also slightly higher than the prevalence of healthcare workers' alcohol consumption that Mokaya et al reported in their study of 35.8% [29]. Their study had however used a convenience sample. Our study also found a rate higher than the reported rates of use in the general population of 10-15% [30]. The current use of alcohol at KTRH of 15.61% was also higher than the 13.6% rate found in the literature [29] and the 11.8% reported by the 2022 Kenya National Survey on Substance Use done by NACADA [10].

The opiates-type drugs' lifetime prevalence of 10.97% in our study was additionally almost triple that reported by Mokaya et al of 3.9%, whereas that for cannabis was 8.44% making the rate similar to the 9.3% reported in the above study [29]. The current use of cannabis was 2.1% in our study, a rate which was double the 1% reported by the 2022 national survey by NACADA [10]. The current use of cigarettes was 4.66% in the current study which was lower than the rate of 9.1% found in other studies in Kenya amongst 15- to 65-year-olds [10] while the current amphetamine use of 1.69% in our study was lower than the 4.2% reported in the literature [29].

Higher odds of substance use were found in those study participants who were male, working as a rehabilitative staff, had a master's degree, had professional experience of less than 10 years, and owned more assets, similar to the findings of other studies [12, 28, 29]. Being married, having more than ten years of professional experience, and having a higher number of children were associated with having lower odds of substance use.

The study's strength was its ability to identify the prevalence and correlates of a wide range of substances used by healthcare workers which is a special population. The major weakness of the study was that this being a cross-sectional study it depended largely on staff's ability to recall information which would introduce recall bias and also the social desirability bias. Given the low prevalence of some of the substances, the study did not have sufficient power to detect all the correlates.

Conclusion

Compared to studies in similar populations and settings in Kenya and globally, our study established that the use of substances among healthcare workers at KTRH was generally higher. Only the lifetime prevalence of cigarette smoking and current use of amphetamines were lower. Given the likelihood of underestimation of the actual prevalence by self-reporting (social desirability bias) and also issues of recall bias, then substance use could still be higher and thus a significant problem in the hospital.

Recommendations

A workplace staff wellness and assistance programme should be instituted to support staff and decrease the stressors which could contribute to substance use. Once specific cases are identified by the human resource department, the focus should be on Alternative-To-Discipline (ATD) measures to harness the benefits of early reporting and management of the affected cases which are much more effective in healthcare workers' substance use management than the traditional disciplinary and sanctioning systems [31-32]. An exploratory and qualitative study to find out the main contributors to the higher substance use prevalence at KTRH is also planned to be carried out.

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