

Original Article

Substance use disorders and their correlates among inmates in a Sri Lankan prison

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Abstract

Background

Substance abuse and dependence are common among prison populations. However, there is a lack of data regarding this issue in Sri Lanka.

Objective

To determine the prevalence of substance use disorders among inmates in a Sri Lankan prison and to find their correlates.

Methods

A semi-structured, interviewer-administered questionnaire was administered, and the ICD 10 clinical diagnostic criteria were applied by a consultant psychiatrist to 410 randomly selected male and female prisoners in minimum/medium security settings in the largest prison in Sri Lanka. The significance of association between various correlates of substance use was ascertained using the Chi-square test and multiple logistic regression analyses.

Results

Out of the total, 75.6% (95% CI 71.2 – 79.5) of prisoners had lifetime substance use disorder while 24.4% (95% CI 20.2– 28.6) met the criteria for current substance use disorder. Of the total, 56.8% (95% CI 52-62) and 67% (95% CI 63-72) of participants met the criteria for lifetime alcohol and tobacco use disorders, respectively, while 42% (95% CI 37-47) and 25.6% (95% CI 21-30) had lifetime cannabis and opioid dependence, respectively. Factors significantly associated with lifetime substance use disorder were male gender, residence in an urban area, younger age and being unemployed or having only temporary employment. 23% of participants who met the criteria for dependence were intravenous substance users

Conclusion

A relatively high prevalence of substance use is seen among this cohort. Studies among inmates of other prisons in Sri Lanka should be carried out to see whether this pattern is generalizable. Services should be improved in the prison health system to formally recognize issues related to substance use and minimize harm from substance use disorders.

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Introduction

Studies done in countries around the world have shown that substance abuse and dependence are common among prison populations [1, 2]. Research has also shown that drug users engage in much higher levels of criminal activities than non-drug users [3,4]. Allen has reported that drug use seems to intensify, motivate and perpetuate offending behaviours [5]. According to the reports of the National Dangerous Drugs Control Board (NDDCB) of Sri Lanka, the total number of persons arrested for drug-related crimes in 2019 had been as high as 89,321 [6]. In addition, the prison environment is implicated as a high-risk environment for drug initiation [7,8].

One of the very few studies done among the Sri Lankan prison population reported widespread use of alcohol, tobacco and illicit substances prior to imprisonment [9]. In this study, only those who had been imprisoned for drug and drug-related offences had been interviewed. The authors reported that heroin (98%) and cannabis (54%) were the main drugs of abuse and that the prevalence of intravenous drug use among the prison population was higher than that officially reported in Sri Lanka (15.8% vs 1) [9].

The present study was carried out to determine the prevalence of lifetime and current substance use disorders and their correlates among the inmates of the largest prison in Sri Lanka. The substances the present study looked at were alcohol, tobacco, cannabis, opioids and other substances (such as amphetamines and betel).

Methods

This cross-sectional study was carried out at the Welikada prison, which is the largest prison in Sri Lanka and situated in Colombo, from November 2013 to March 2014. In the year 2014 (during the period of this study) the prison had 3703 unconvicted (remand) and 11,797 convicted prisoners [10]. Of the unconvicted prisoners, 1172 (31.65%) were females while out of the convicted prisoners 11369 (96.37%) were males. According to the same source, in the year 2013, out of the total prison admissions to all prisons in Sri Lanka, 49% had been due to substance-related offences (such as trafficking).

Sampling procedure

Previous studies have shown that the prevalence of substance use disorders among the prison population is around 50-70%. Therefore, a sample size of 400 was assumed to estimate a prevalence of substance use around 50%, to within 5% of the actual value with 95% confidence. The inclusion criterion was the ability of an inmate to provide written informed consent.

According to prison guidelines and rules, at the time of the study, around 2673 inmates (both convicted and unconvicted) were allowed to come out of their cells to participate in various activities within the prison grounds. We invited them to attend the information sessions we conducted regarding the study, through announcements in the public announcement system and leaflets distributed to them when they were allowed out during religious observances, exercise sessions, etc. These explained the purpose of the study, the voluntary nature of their participation and their right to withdraw from the

study at any point. The inmates were also informed that the investigators were an independent team and not affiliated to prison hospitals, were not part of their medical, surgical, or psychiatric management and not part of the panels appointed to provide court reports.

Consecutive inmates, as per their prison cell order, who were willing to participate in the study and were able to provide written informed consent were recruited. Maximum security inmates were not included in the study due to security reasons. Out of the 2673 prison inmates (convicted and unconvicted) who were invited to participate, 410 provided written informed consent. An interviewer-administered questionnaire was used to collect socio-demographic details, their reasons for substance abuse and substance-related information and imprisonment related factors. A consultant psychiatrist assessed all participants for the presence of ICD 10 [11] criteria for substance dependence for life or the current twelve months as well as the presence of any of several comorbid psychiatric disorders. If a participant fulfilled the criteria for dependence during their lifetime or during the last twelve months, they were considered to have lifetime substance use disorder or current substance use disorder, respectively.

The protocol was approved by the Ethics Review Committee of the Faculty of Medicine, University of Kelaniya. Permission to conduct the study was obtained from the Commissioner General of Prisons.

Data were analyzed using SPSS software and the significance of association between various correlates of substance use was calculated using the Chi-square test with a finding of $p < 0.05$ considered statistically significant. As many of the predictor variables were correlated, the adjusted strength of association between individual predictor variables and substance use disorder was ascertained through multiple logistic regression analyses.

Results

Out of the 410 participants, 80.2% were males (Table 1) with 205 (50%) in the age group 25-40 years. Of the total, 53% were from an urban background. As shown in Table 1, 91% had an educational level below GCE O/L and 82% of the participants were either unemployed or were temporarily employed.

Table 1: Socio- demographic characteristics of the sample

Variable	N(%)
Gender	
Male	329(80.2)
Female	81(19.8)
Age	
Less than 20 years	85(20.7)
20- 39 years	205(50)
40-59 years	109(26.6)
Above 60 years	11(2.7)

Residence	
Rural area	191 (46.6)
Urban area	219 (53.4)
Marital status	
Y	292(71.2)
Single	87 (21.2)
Divorced	8 (1.9)
Separated	23 (5.6)
Education	
Below O/L	372 (90.7)
Above O/L	38 (09.3)
Employment status	
Permanent employment	74 (18.0)
Unemployed/ temporary	336 (82.0)
Reason for imprisonment	
Theft	149(36.3)
Assault	142(34.6)
Possession/smuggling illicit drugs/alcohol	81(19.8)
Murder	25(6.1)
Other	13(3.2)

The prevalence of substance dependence for any substance during the last 12 months was 24.4% (95% CI 20.2– 28.6). Prevalence of current alcohol and tobacco use disorder was 8.1% (95% CI 5.6-11.1) and 31.3% (95% CI 26.7-35.9), respectively. The figures for cannabis and opioids were 11.3% (95% CI 8.3-14.8) and 9.5% (95% CI 6.8-12.7), respectively.

The prevalence of lifetime substance use for any substance was 75.6% (95% CI 71-80). Of the lifetime substance users, 78.8% were 40 years or younger and 77. 8% of them had a history of unemployment (Table 2).

Table 2: Relationship between socio-demographic variables and the presence of lifetime substance use disorder

Variable	lifetime substance use disorder present N(%)	lifetime substance use disorder absent N(%)	P value
Gender			
Male	272 (82.7%)	57 (17.3)	<0.001
Female	38 (46.9%)	43 (53.1%)	
Age			
Less than 40	230 (78.8%)	62 (21.2%)	0.022
More than 40	80 (67.8%)	38(27.5%)	

Marital status			
Married	214 (73.5%)	77 (26.4%)	0.162
Single /separated/divorced	96 (80.7%)	23 (19.3%)	
Education			
Below grade 10	293 (78.7%)	79 (21.2%)	<0.001
Above grade 10	17 (44.7%)	21 (55.3%)	
Employment status			
Unemployed	261 (77.7%)	75 (22.3%)	0.051
Employed	49 (66.2%)	25 (33.8%)	
Parental loss/separation			
Present	78 (72.2%)	30 (28.6%)	0.362
Absent	232 (76.8%)	70 (23.1%)	
History of mental illness			
Present	52 (91.2%)	5 (8.7%)	0.002
Absent	258 (73.1%)	95 (26.9%)	
Family history substance misuse/dependence			
Present	50 (79.4%)	13 (20.6%)	0.525
Absent	260 (74.9%)	87 (25.1%)	
Previous imprisonment			
Present	89 (81.6%)	20 (18.3%)	0.092
Absent	221 (73.4%)	80 (36.2%)	

Males and those less than 40 years old had higher odds of harmful use or dependence on any substance (OR= 10.3 and 2.0 respectively). Having a lower education level, residing in an urban area and being unemployed or only having temporary employment also had higher odds of being dependent or having harmful use of any substance. (OR 3.2, 1.2, 0.49 respectively). Furthermore, a past history of mental illness and having served a previous prison sentence had higher odds of (0.25. and 0.41 respectively) of using a substance or substances. History of parental separation or parental loss as a child, family history of substance use or mental illness did not have a higher odds ratio for using a substance.

The highest prevalence for any lifetime substance use disorder was in those less than 20 years of age (Table 3). In that age group, the most commonly used substance was tobacco, mostly in the form of smoking. At least 50% or more inmates in this age group met the criteria for alcohol and cannabis use disorders and 47.6% fulfilled the criteria for an opioid use disorder (Table 3).

Alcohol was the most prevalent substance use disorder among males while opioids were more commonly used than other substances by female prison inmates (Table 4).

Table 3: Prevalence of lifetime substance use disorders according to age distribution

Age category	any substance use N(%)	alcohol use N(%)	tobacco use N(%)	cannabis use N(%)	opioid use N(%)
Less than 20y (n = 85)	70(82.3)	85(61.2)	67(79.8)	50(59.5)	40(47.6)
20-39 y (n = 205)	158(75.6)	116(56.6)	139(67.8)	92(44.9)	56(27.3)
40- 59y (n = 109)	73(66.9)	58(53.2)	61(55.9)	28(25.7)	9(8.3)
More than 60y (n = 11)	9(81.8)	7(63.6)	9(81.8)	2(18.1)	0(0)

- % Within each age category

Table 4: Comparison of lifetime substance use disorders among male and female prison inmates

Substance	Prevalence among males (n = 329)	Prevalence among females (n = 81)	P
Alcohol	230 (69.9%)	21 (25.9%)	<0.001
Tobacco	253 (76.9%)	23 (28.4%)	<0.001
Cannabis	151 (45.9%)	21 (25.9%)	0.002
Opioids	76 (23.1%)	29 (35.8%)	0.023
Any substance	272 (82.7%)	38 (46.9)	<0.001

Further analysis of the data was carried out to determine the strength of association between various variables and substance use. Table 5 shows the results of binary multiple logistic regression.

Table 5: Summary of the multiple logistic regression for factors associated with lifetime prevalence of substance use

Variable	Odds ratio (95% CI)	P
Age < 40 years	1.9 (1.1 – 3.3)	0.025
Male gender	11.6 (6.0 – 23.5)	<0.001
Education < O/L	2.9 (1.3 – 6.7)	0.011
History of mental illness	4.3 (1.6 – 12.6)	0.006
Previous imprisonment	2.2 (1.1 – 4.6)	0.025

Of those who were serving a sentence, 19.8% were imprisoned due to illicit drug smuggling or trafficking, and out of them, 63.8% were male. Out of those who were imprisoned due to a conviction of illicit drug smuggling or trafficking 53.4% had served at least one previous sentence for the same reason, 80.0% were dependent or meeting

criteria for harmful use of any substance. Out of those dependent or meeting criteria for harmful use of a substance, 56.2% and 68.8% met criteria for a lifetime alcohol and tobacco dependence/harmful use respectively, and 58.8% and 68.8% met criteria for lifetime cannabis and opioid use disorder, respectively.

Illicit substances used among the participants were cannabis [either locally grown or Kerala ganja (otherwise known as KG, a type of cannabinoid)], heroin, amphetamines (commonly in the form of ICE), gamma-hydroxybutyric acid (GHB), and illicitly brewed alcohol. Cannabis was used among 36.8% of the prison inmates who were male. Heroin was the most prevalent illicit substance used by female prison inmates.

When those who were serving a sentence for murder or attempted murder were considered 82.7% met the criteria for dependence/ harmful use of any substance. 71.3% and 74.7% fulfilled diagnostic criteria for alcohol and tobacco use disorder respectively, while 74.7% and 5.3% met criteria for cannabis and opioid use disorder respectively.

Among those who were found to have a lifetime substance use, 61% had been introduced to substance use by friends, and 28% by spouse or partner. The common reasons attributed to substance use included relief from stress (24.5%), to be accepted by peers (14.9%), experimentation (13.4%), boosting of confidence (8.0%) and feeling "normal" (5.2%).

Out of those who used opioids, 22.8% had used the drug intravenously at some point in their lives. Fear of infection and fear of pain was the commonest reason for not considering intravenous drug use by the others. Among those who used intravenous drugs the reason for choosing this route was the user's belief that this route gives maximum pleasure.

Discussion

To the best of our knowledge, the current study is the second study done in this area in our country and the study population consisted of prison inmates who volunteered to participate. The overall prevalence of a substance use disorder during the last 12 months for any substance among prison inmates was 24.4 % (95% CI 20.2– 28.6), while it was 75.6% (95% CI 71.2 – 79.5) when lifetime prevalence for any substance was considered based on ICD 10 diagnostic criteria.

Two studies done in the US had shown that lifetime substance abuse or dependence disorders were detected among 74% and 61% of inmates respectively [1,2]. A study done in Iran by Assadi et al [12] showed that 74% met the criteria for a lifetime substance use disorder.

Studies done in other countries [13], have also reported that, when compared with the general population, prison inmates have higher lifetime substance use disorders. A New Zealand study that used DSM III criteria had reported that 35% met the criteria for recent substance use [13]. While our figures are lower than the above studies, our data is comparable to a previous study done among Sri Lankan prison inmates [9]. The other

published study regarding substance use in Sri Lanka was among those with mental illnesses and the figures were much lower than those in the current study [8].

Tobacco was the most prevalent dependent substance among the study population. The reason for tobacco to have a higher prevalence than other substances may be because of the ease of illicit acquisition in the prison system. Cannabis was the most prevalent illicit substance used among males while heroin was the most prevalent illicit substance used by female inmates prior to being imprisoned. We also found that a majority of the participants who were incarcerated for illicit drug possession or smuggling fulfilled the criteria for a substance use disorder for that particular illicit substance. It has been previously reported that drug-related offences are often committed to support the maintenance of drug use and, in our sample, more than half of those who had served a sentence for a drug-related crime had a reconviction for the same issue [14]. When those who were serving a sentence for murder or attempted murder were considered, a majority (82.7%) met the criteria for dependence / harmful use of any substance. Other studies have shown that both alcohol and cocaine are associated with violent crime [15, 16].

Among those who were found to have a lifetime substance use disorder, the majority had been introduced to substance use by friends. However, in the case of females most of them had been introduced to substances by their de-facto partners and or spouses. The common reasons attributed for substance use included relieving stress, acceptance by peers, experimentation, easy access, feeling normal and boosting confidence.

Out of those who used opioids, 22.8%, were intravenous users at some point in their lives. A previous study done among a group of Sri Lankan prison inmates has reported the prevalence of intravenous drug use as 19.8% [9] and the figure reported by the National Dangerous Drugs Control Board of Sri Lanka is 1% [6]. Possible reasons for this discrepancy may be due to changes in trends of substance use patterns over time and availability of the particular substance. When those who used opioids through snorting, sniffing or smoking were asked the reasons why they used those methods instead of the intravenous route, the most commonly chosen responses were fear of infection and fear of pain.

In our study sample, male gender, age less than 40 years, residing in an urban setting, being unemployed and having a lower educational level had a significant association with a substance use disorder. The highest prevalence for any lifetime substance use disorder in our study population was among those less than 20 years. The substance most prevalently used among this group was tobacco. A study was done in a prison in Western Kenya also has reported a significant association of a lifetime substance use disorder with younger age and lower educational level [17]. Kandel reported that in adolescents and in young adults, tobacco smoking can act as the gateway drug for alcohol and other illicit substances in later life, and research has also shown that use of nicotine is commoner among those with a lower educational attainment and that incarceration may act as an independent risk factor for smoking [14,18,19].

A past history of a mental illness also had a significant association with developing a comorbid substance use disorder among our study population and similar results have been shown in studies done across the world among prison populations which indicate that the presence of dual diagnosis (mental illness and substance disorder) is more prevalent among this population [20,21].

Limitations

Our sole informants were the inmates themselves. Collateral histories and serum analysis for drugs would have provided more conclusive information about substance use. The number of women in our study sample was relatively small and it may, therefore, be difficult to detect small gender differences. We interviewed only those who were willing to give written informed consent. Therefore, there may have been a volunteer bias. In addition, prison inmates with substance issues may have volunteered to participate. Therefore, our prevalence figures may be an over-estimate of the actual prevalence. These limitations should be taken into account when interpreting the findings in this report.

Conclusions

This study demonstrates a high prevalence of substance use among prison inmates at the largest prison in Sri Lanka. Alcohol, tobacco, cannabis, and opioids were the most commonly used substances while injecting drug use was also found at rates higher than previously reported in official reports. The use of substances such as tobacco and cannabis rather than “hard drugs” (such as opioids, cocaine, and methamphetamines) was more prevalent among the younger inmates with lower educational attainment.

Recommendations

The findings of this study reiterate the need for improving the presently inadequate screening and treatment facilities for prison inmates with substance use disorders as well as those with comorbid mental illnesses in the Sri Lankan prison system. The services should include formal screening for substance abuse and intervention strategies in high-risk populations such as younger males who have a lower education level and who are unemployed.

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Declaration

Ethics approval and consent to participate.

Ethics approval was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Kelaniya. Permission was obtained from the Commissioner of Prisons to recruit inmates and only those inmates who were willing to participate were recruited into the study. The study was carried out in accordance with relevant guidelines

and regulations of the Ethics Review Committee, Faculty of Medicine, University of Kelaniya. Written informed consent was obtained from all inmates who were willing to participate. The inmates recruited were all above the age of 18 years.

Consent for publication

All authors have given consent to publish

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Authors contributions

AH, HJdeS developed the concept. AH, HJdeS, AP, KALAK developed the protocol. AH and SD conducted the information sessions and reviewed participants for ICD 10 criteria, AH and AP conducted the data analysis. AH, HJdeS, AP, SD and KALAK contributed to the development of the manuscript. All authors approve the final manuscript.

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