Substance Use Disorders and Their Correlates Among Inmates in a Sri Lankan Prison

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Research Article

Abstract

Introduction

Substance abuse and dependence are common among prison populations. However, there is few data regarding this problem in Sri Lankan.

Objective: To determine the prevalence of substance use disorders among inmates in a Sri Lankan prison

Method: A semi- structured interviewer administered questionnaire and ICD 10 clinical diagnostic criteria were applied to 410 randomly selected male and female prisoners in minimum/medium security settings in the largest prison in Sri Lanka.

Results: 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 criteria for current substance use disorder. 56.8% and 67 % of participants met criteria for lifetime alcohol and tobacco use disorders, respectively, while and 42 %and 25.6% 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 criteria for dependence were intravenous substance users.

Conclusions: Services should be improved in the prison health system to minimize harm from substance use disorders.

Background

Studies done in counties 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 activity than non- drug users [3,4]. Allen has reported that drug use seems to intensify, motivate and perpetuate offending behaviour[5]. According to reports of the National Dangerous Drugs Control Board (NDDCB) of Sri Lanka, around 200-380/ 100, 000 drug related arrests had been reported in Sri Lanka annually over the last few years[6]. In addition, the prison environment has been implicated as a high-risk environment for drug initiation [7,8].

One of the very few previous studies done among Sri Lankan prison populations reported widespread use of alcohol, tobacco and illicit substances[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.

Methods

This cross-sectional study was carried out at the Welikada prison, Sri Lanka's largest prison situated in Colombo. During the year 2014 this prison had 3703 unconvicted (remand) and 11, 797 convicted prisoners [10]. Out of the unconvicted prisoners, 1172 (31.65%) were males 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 prions in Sri Lanka, 49% had been due to substance related offences (users or traffickers)

Sampling procedure

Previous studies have shown prevalence of substance use disorders among the prison population to be 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.

We held several discussion sessions regarding the study for all prisoners who were allowed out of their cells. We also distributed leaflets and participant information sheets among them, which explained the purpose of the study, 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 if they were on any form of treatment and not part of the panels appointed to provide court reports.

Consecutive inmates, as per their prison cell order, who were able to provide written informed consent were recruited. Out of the 653 prisoners who were invited to participate 427 attended the information sessions. Of these, 410 gave written informed consent to participate.

An interviewer administered questionnaire was used to collect socio-demographic details. A consultant psychiatrist assessed all participants for the presence of ICD 10[11] criteria for harmful use of substances or dependence for the lifetime or the current 12 months as well as the presence of any or several substances or any comorbid psychiatric disorders. If a participant fulfilled criteria for harmful use or dependence during their life time or during the last 12 months they were considered to have either life time substance use disorder or current substance use disorder.

The study was carried out from November 2013 to March 2014. The protocol was approved by the Ethics Review Committee of The Faculty of Medicine, University of Kelaniya. Permission was obtained from the Commissioner General of Prisons to conduct the study. Maximum security inmates were not included in the study due to security reasons.

Data were analyzed using SPSS software and significance of association between various predictor variables and substance use was tested using the Chi square test and a finding of $p < 0.05$ was considered statistically significant. As many of the predictor variables were correlated and 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%) of the participants in the age group 25 -40 years. 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.

The prevalence of substance use disorder during the last 12 months for any substance was 24.4% (95% CI 20.2– 28.6). Prevalence of current alcohol and tobacco use disorder were 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 life time substance use for any substance was 75.6%. Of the life time substance users, 78.8% were 40 years or younger and 77. 8% of them had a history of unemployment (Table 2).

Males and those who were less than 40 years old had higher odds of having harmful use or dependence of any substance (OR= 10.3 and 2.0 respectively). Having a lower education level, residing in an urban area, being unemployed or only having a 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, having being imprisoned earlier had higher odds (OR =0.25. and 0.41 respectively). History of parental separation or loss as a child, family history of substance use or mental illness did not have a higher odds.

The highest prevalence for any life time 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 criteria for alcohol and cannabis use disorders and 47.6% fulfilled 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)

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

Of those who were serving a sentence 19% were imprisoned due to illicit drug intake/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 intake/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 a harmful use of any substance. Out those dependent or meeting criteria for harmful use of a substance, 56.2% and 68.8% met criteria for alcohol

and tobacco dependence/harmful use respectively, and 58.8% and 68.8% met criteria for a cannabis and opioid use disorder, respectively.

Illicit substances used among the participants were cannabis (either locally grown or Kerala ganja), heroin, ICE, 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 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 use to relieve stress (24.5%), acceptance by peers (14.9%), experimentation (13.4%), availability (8.0%), to feel "normal" (5.2%) and to boost their confidence.

22.8% of users of opioids were intra -venous users. Fear of infection and fear of pain were 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 users' belief that this route gives maximum pleasure.

Discussion

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 life time prevalence for any substance was considered based on ICD 10 diagnostic criteria. A previous study done among a group of Sri Lankan prison inmates has reported the prevalence of intravenous drug use as 15.8 % [9] and the figures reported by the National Dangerous Drugs Control Board of Sri Lanka (1%) [6] are much lower than our figure of 23%. Possible reasons for this may be due to changes in trends of substance use patterns over time and availability of the particular substance.

Two studies done in the US had shown that lifetime substance abuse or dependence disorders were detected among 74% [1] and 61% [2]of inmates respectively. A study done in Iran by Assadi et [12] al showed that 74% met 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 life time substance use disorders. A New Zealand study which used DSM II criteria had reported that 35% met criteria for a recent substance use[13]. These differences could be attributed to cultural differences, relatively reduced availability of these substances and reduced affordability among the Sri Lankan population. However,

these figures among the prison inmates are much higher than mentally ill patients with comorbid substance use disagnosis[8].

Tobacco use was the most prevalent substance use disorder. 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 prevent illicit substance used by female inmates. We also found that a majority of the participants who were incarcerated for illicit drug intake or smuggling fulfilled criteria for a substance use disorder for that particular illicit substance. It has been previously reported that drug-related offenses are often committed to support the maintenance of the drug use [14] and in our sample more than half of who had served a sentence for drug related crime had a reconviction for the same issue. When those who were serving a sentence for murder or attempted murder were considered a majority (82.7%) met criteria for dependence/ harmful use of any substance. Other studies have shown that both alcohol [15] and cocaine[16] are associated with violent crime.

Among those who were found to have a lifetime substance use disorder, the majority had been introduced to substance use by friends, by spouse or partner. The common reasons attributed to substance use included to relieve stress, acceptance by peers, experimentation, availability, to feel normal (5.2%) and to boost their confidence. 22.8% of users of opioids were intra -venous users at some point in their lives. Fear of infection and fear of pain were the commonest reason for not considering intravenous drug use. Only a few previous studies have looked into the reasons for drug users not using the intravenous route[17, 18]. Some of these studies report needle phobia as a cause.

In our study sample male gender, age less than 40 years, residing in an urban setting, being unemployed and a lower educational level had a significant association with meeting criteria for a substance use disorder. Highest prevalence for any life time substance use disorder in our study population was among those less than 20 years and the substance most prevalently used among this group was tobacco and was associated with lower education attainment and unemployment. Presence of a past history of a mental illness also had a significant association of developing a comorbid substance use disorders among our study population. A study done in a prison in Western Kenya also has reported significant association of a life time substance use disorder with younger age and lower educational level [19]. Kandel[14] 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[20] and that incarceration may act as an independent risk factor for smoking[21].

Limitations

Our study was a cross-sectional study therefore it is not possible to make any conclusions as to the causal relationships between the various variables and substance use. Our sole informants were the inmates them-selves, and collateral histories and serum analysis for drugs would have provided more

conclusive information about their substance use. The number of women in our study sample was relatively small, and it may, therefore, be difficult to detect small gender differences. These limitations should be taken into account when interpreting the findings in this report.

Conclusion

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 from Sri Lanka. Use of substances such as tobacco and cannabis rather than "hard drugs" were more prevalent among the younger inmates with a lower educational attainment. The findings of this study reiterate the need for improving, presently inadequate, treatment facilities for prison inmates with substance use disorders in the Sri Lankan prison system. The services should include, screening for substances in the prison system and development of intervention strategies in high risk populations such as younger males who have a lower education level and who are unemployed.

Declarations

Acknowledgements

Ethics approval and consent to participate

Ethical 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 in to 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. And the written informed consnset was obtained from all inmates who were willing to participate. The inmates recruited were all above the age of 18years.

Consent for publication

All authors have given consent to publish

Availability of data and materials

Data will be made available on request by the corresponding author.

Authors contributions

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

References

1. Teplin L.A. The prevalence of severe mental disorder among urban jail detainees: comparison with the Epidemiologic Catchment Area Program. *Am J Public Health* 1990; 84:290-293

2. Jemelka R, Turpin E, Chiles J.A. The mentally ill in prisons: a review. *Hosp Community Psychiatr*1989; 4048 1-59 1.

3. Gossop, M., Marsden, J., Stewart, D., and Rolfe, A. Reductions in acquisitive crime and drug use after treatment of addiction problems: 1-year follow-up outcomes. *Drug Alcohol Depend* 2000;58(1−2), 165−172.

4. Seddon, T. Explaining the Drug−Crime Link: Theoretical, Policy and Research Issues. *J Soc Policy* 2000; 29(01), 95−107.

5. Allen, J.P. The links between heroin, crack cocaine and crime. *J. Criminol* 2005; 45: 355−372.

6. .HANDBOOK OF DRUG ABUSE INFORMATION IN SRI LANKA NATIONAL DANGEROUS DRUGS CONTROL BOARD (NDDCB). MINISTRY OF DEFENCE., Kotte Road, Rajagiriya, Sri Lanka. 2013

7. Duhamel A, Renard JM, Nuttens MC, Devos P, Beuscart R, Archer E: Social and health status of arrivals in a French prison: a consecutive case study from 1989 To 1995. *Rev Epidemiol Sante Publique.* 2001; 49(3):229-238.

8. Mason D, Birmingham L, Grubin D: Substance use in remand prisoners: a consecutive case study. *BMJ* 1997; 315(7099):18-21

9. Dissabandara LO, Dias SR, Dodd PR, Stadlin A. Patterns of substance use in male incarcerated drug users in Sri Lanka. *Drug Alcohol Rev*. 2009; 28(6):600-7.

10. Prison Head- Quarters of Sri Lanka .Prison statistics of Sri Lanka 2014,

11. World Health Organization. The ICD-10 classification of mental and behavioural disorders. Clinical descriptions and diagnostic guidelines. Tenth Revision. Geneva: World Health Organization; 1992

12. Assadi S.M, Moroozian M, Pakravannejad M, Yahyazadeh O, et al. Psychiatric morbidity among sentenced prisoners: prevalence study in Iran. *Br J Psychiatry* 2006;188: 159-164

13. Bushnell J.A, Bakker L.W. Substance use disorders among men in prison: a New Zealand study. *Aust N Z J Psychiatry* 1997; 31(4):577-81.

14. Kandel D B. Stages and pathways of drug involvement: Examining the gateway hypothesis. Cambridge, England: Cambridge University Press; 2002

15. W F Wieczorek; J W Welte; E L Abel. Alcohol, Drugs and Murder: A Study of Convicted Homicide Offenders. *J Crim Justice* 1990;18 (3):217-227

16. Buchanan A, Nich C, Douglas KS, Babuscio T, Easton CJ. Risk factors of violence during a 4-week period in a psychiatric outpatient population. *J Nerv Ment Dis*. 2013 . 201(12):1021-1026

17. Tompkins N, S. Ghoneim S, Wright N, . Sheard L, et al.Needle fear among women injecting drug users: a qualitative study. *J. Subst. Use* 2007;12:281 – 291

18. McBride, A.J., Pates, R.M., Arnold, K. and Ball, N. Needle fixation, the drug user's perspective: a qualitative study. *Addiction* 2001; 96: 1049-1058. doi:10.1046/j.1360-0443.2001.967104914.x (12):1021-6.

19. Kinyanjui DW, Atwoli L. Substance use among inmates at the Eldoret prison in Western Kenya. *BMC Psychiatr*. 2013 ; 13;13:53. doi: 10.1186/1471-244X-13-53.

20. Gilman, S. E., Martin, L. T., Abrams, D. B., Kawachi, I., Kubzansky, L., Loucks, E. B., Buka, S. L. Educational attainment and cigarette smoking: a causal association?. *J. Epidemiol.* 2008; 37(3), 615–624. doi:10.1093/ije/dym250

21. Howell BA, Guydish J, Kral AH, Comfort M. Prevalence and factors associated with smoking tobacco among men recently released from prison in California: A cross-sectional study. *Addict Behav*. 2015;50:157–160. doi:10.1016/j.addbeh.2015.06.017

Tables

Table 1- socio- demographic characteristics of the sample

Variable	Number (%)
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	
Married	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)

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

Variable	life time substance use disorder present (%)	life time substance use disorder absent (%)	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%)	

Table 3 lifetime substance use disorders according to age distribution

Age category	Prevalence of any substance use disorder (%)	Prevalence of alcohol use disorder(%)	Prevalence of tobacco use disorder (%)	Prevalence of cannabis use disorder (%)	Prevalence of opioid use disorder (%)
Less than 20 y (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 life time substance use disorders among male and female prison inmates

Substance	Prevalence among male (n = 329)	Prevalence among female (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

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