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## General health characteristics, psychological stress of inmates and living environment of a main prison in Sri Lanka

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### Abstract

**Background:** Prison inmates, a deprived community are a part of general population. Understanding of their health characteristics, psychological stress and living environment is important to upgrade the existing situation.

**Objectives:** To describe sociodemographic data, general health characteristics, psychological stress of prison inmates and living environment of a main prison in Sri Lanka.

**Methods:** This was a descriptive cross-sectional study conducted among prison inmates of a main prison in Southern Sri Lanka. A self-administered questionnaire, K10 psychological distress scale and a checklist formulated by International Committee of Red Cross for evaluating the living environment and medical records were used to collect data.

**Results:** There were 845 inmates with a median age of 33 years and 576/845(68.1%) were below 40 years. Majority of them had received school education 816/845(96.6%) and 401/845(47.4%) were skilled workers. There were inmates with a past history of being 560/845(66.2%) smokers, 525/845(62.1%) alcohol, 107/845(12.6%) heroin and 143/845(16.9%) cannabis users. Diabetes mellitus, hypertension, ischemic heart disease, psychiatric disorders, asthma and trauma were reported in 72/845(8.5%), 60/845(7.1%), 27/845(3.2%), 148/845(17.5%), 46/845(5.4%) and 33/845(3.9%) inmates respectively and psychological stress was experienced by 265/845(31.3%). Less number of inmates had communicable diseases. Score of standards for living environment was 50.

**Conclusions:** Inmates were from young working group of the community. Past history of psychoactive substance use was high. The proportion of inmates with non-communicable diseases was higher than communicable diseases. Living environment of the prison was at an acceptable level.

**Keywords:** Demography, Health, Psychological stress, Living environment, Prison inmates



## INTRODUCTION

Prison population has increased in recent past and annual turnover of prison population is closer to 30 million worldwide [1]. Total prison population shows steady increase recently according to the Ministry of Justice and Law Reforms, Sri Lanka [2]. Prison population experiences marginalization and health inequality and social deprivation [3, 4]. As a result, they are at a higher risk of communicable [5] and non-communicable diseases [6]. The prevalence of history of addiction to alcohol and psychoactive or narcotic drugs [7] and psychological disorders [8] are at a higher rate among prison inmates compared to general population [9].

Prisoners are a group of members from the general community. Hence, the identification of their health problems is important to improve the public health in long term. Assessment of prevailing health characteristics is critical to understand how best to develop appropriate health interventions for prisoners in view of providing a better care during the stay in the prison. Therefore, our objectives were to find out the basic sociodemographic and health characteristics, psychological stress among prison inmates and living standards of a main prison in Sri Lanka.

## MATERIALS AND METHODS

It was an institution-based, descriptive, cross-sectional study conducted in a main prison, in Southern Sri Lanka. All consecutive inmates imprisoned during one year (May 2015 to May 2016) was recruited. Inmates who were released within three days after the imprisonment were excluded from the study.

A questionnaire was designed to collect the basic data and was pretested in a group of inmates who were not included in the main study. It was a self-administered questionnaire to collect the sociodemographic data and general health information anonymously to maintain the confidentiality. However, the questionnaire was read out for the illiterate inmates and was completed by one of the investigators (medical doctor) who were not attached to the Prison Hospital. Medical records were used to extract data on health characteristics in a manner by which identity of the individual was not revealed.

Occupational categories were defined according to the Baker & Hall guidelines [10]. Addiction was defined according to the ICD -11 classifications as repeated failure to resist an impulse, drive, or urge to perform an act that is rewarding to the person (at least in short-term), despite longer term harm either to the individual or to others[11]. A checklist formulated by International Committee of Red Cross (ICRC) for evaluating environmental and engineering problems assess the prison premises was used [12]. This checklist provides rapid visualization of the situation in a prison and there were five domains, each of which accounts for 15 marks; detainees hygiene and health, water supply, sanitation, space and quarters, kitchen and meals. Sinhala version of K10 psychological distress scale (validated for Sri Lankans) was pretested and was used in the assessment of anxiety and depressive symptoms during the most recent four weeks [13, 14].

The ethical clearance was obtained from the Ethics Review Committee, Faculty of Medicine, University of Ruhuna. It was conducted according to the ethical guidelines outlined in the Declaration of Helsinki. Permission was obtained from the prison authorities to conduct the study. Informed written consent was obtained from all the participants using a consent form. Voluntary participation and the freedom to withdraw from the study irrespective of the consent given were emphasized. Data were anonymous and strict confidentiality was maintained. After the history and clinical examination inmates who found to have health problems were referred for appropriate treatments.

Categorical data were displayed as frequencies and percentages. Numerical data were examined for normality and presented as mean  $\pm$  SD or median. Chi squared test was used to compare the categorical variables.

## RESULTS

### Basic characteristics

Total of 845 inmates were imprisoned during the period. They were in the age range of 17-79 years with a median age of 33 years. Among them 576/845(68.1%) were below the age of 40 years. There were 828/845(97.9%) males and

17/845(2.1%) females. Most of the inmates 758/845(89.7%) were from the same district where the prison was located. There was only one female with a past history of addiction to heroin, but not for any other psychoactive agents including alcohol and cigarettes at the time of imprisonment. They had been directed to rehabilitation programmes appropriately. Further, there were only five females with non-communicable diseases. Hence, gender-based comparison was not performed. Sociodemographic characteristics are shown in Table 1. and health characteristics are displayed in Table 2.

Table 1. Sociodemographic characteristics of inmates in the prison

Characteristic	Frequency (%) (n=845)
<b>Ethnicity</b>	
Sinhalese	796(94.2%)
Muslims	26(3.0%)
Tamils	23(2.7%)
<b>Religion</b>	
Buddhists	775(91.7%)
Islamic	48(5.7%)
Hindus	22(2.9%)
<b>Education</b>	
Not schooled	29(3.4%)
Grade1-10	495(58.6 %)
GCE O/L completed	249(28.9%)
GCE A/L completed	64 (7.6%)
Higher education	08(0.9%)
<b>Marital status</b>	
Single	266(31.4%)
Married	531(62.8%)
Divorced	12(1.4%)
Separated	36(4.2%)
<b>Occupation category</b>	
Professional	01(0.1%)
Skilled workers	401(47.4%)
Unskilled workers	396(46.8%)
Unemployed	47(5.6%)

GCE O/L= General Certificate of Education Ordinary Level

GCE A/L = General Certificate of Education Advances Level

Table 2. Health characteristics of prison inmates

Characteristic	Frequency (%) (n=845)
<b>Addictions †</b>	
Smoking	560(66.2%)
Alcohol	525(62.1%).
Heroin	107(12.6%)
Cannabis	143(16.9%)
<b>Non-communicable diseases</b>	
Diabetes mellitus	72(8.5%)
Hypertension	60(7.1%)
Asthma	46(5.4%)
Psychiatric illnesses	148(17.5%)
Skin diseases	15(1.8%)
Ischemic heart disease	27(3.2%)
<b>Communicable diseases</b>	
Smear positive tuberculosis	05(0.6%)
<b>Past surgical history</b>	
Herniotomy and repair	7(0.8%)
Chronic leg wounds and varicose veins	5(0.6%)
¶Trauma	33(3.9%)

†Addiction = past history of psychoactive substances use prison.

¶ Trauma includes cut injuries, head injuries, trauma to eye, road traffic accidents and gunshot injuries

Past surgical history showed a high rate of trauma among the prisoners. We did not observe significant association between substance abuse and the presence of non-communicable diseases ( $p = 0.748$ ) or trauma ( $p=0.085$ ) in this group.

### Environment assessment

The environment and engineering status of the prison were displayed in Table 3. Prison with the highest score has the fewest problems in terms of environment and engineering according to this score.

Table 3. Data related to environment and engineering of the prison.

Domain	Score
Detainees hygiene and health	12/15
Water supply	12/15
Sanitation	7/15
Space and quarters	6/15
Kitchen and meals	13/15
<b>Total score for prison</b>	<b>50/75</b>

Maximum number of points obtained by each domain = 15

Total for 5 domains = 75

The overall score for this prison was 50. It was above 40, an arbitrary value if below that an immediate action is necessary to prevent the deterioration of the health of detainees [12]. This score assessed the quality of the space and the living surrounding of the premises, not the overcrowding.

### Psychological stress

Among the inmates 265/845(31.4) % experienced psychological stress (total score > 20) according K10 psychological distress scale (Figure 1). The number of inmates with psychological stress according to the K10 scale was higher than the number of inmates reported with psychiatric illnesses (based on the medical records) who were already on treatment.

According to this study majority of the inmates were young, Sinhalese, Buddhist males. The proportions of Sinhalese, Sri Lankan Tamils, Indian Tamils and Sri Lankan Moors are 74.9%, 11.2%, 4.2% and 9.2% respectively according to the ethnic distribution of Sri Lankan population. The distribution of country population according to the religion shows that there are 70.2% Buddhists (official), 12.6% Hindus, 9.7% Muslims and 6.1% Roman Catholics etc [15]. The prison is located in an area where the majority is Sinhalese Buddhists. Most of them were from the locality where the prison is situated. Further, country population statistics on age structure indicates that majority (41.58 %) are in the age group of 25-54 years [15]. Hence, the demographic characteristics of prison

inmates are in line with the population demographics in the country.

Prison population has low educational achievements compared to the general population according to previous literature [16]. Hence, occupational and social deprivation have been reported and are associated with economic burden [17]. However, according to the present study majority of them had received school education and most were skilled-workers and were married. Hence, incarceration may lead to more economic loss and cause more social impact especially if the parent or the bread winners of the family get imprisoned [18].

Prisoner community is generally younger males in many settings. This is probably, because young adulthood is the prime age during which crime, substance use, and imprisonment are at their peaks. Age is a predictor of self-harm which is commoner among young [19]. However, it has been evident that the age distribution of the prison population in USA has shifted upward dramatically probably due to the cohort effect [20].

We found that past history of tobacco, alcohol, heroin and cannabis use is high among the inmates. According to the existing literature, use of heroin or non-heroin illicit drugs by the individuals who get imprisoned is high all over the world [21]. It is evident that use of heroin itself impairs the cessation of smoking [22]. Hence, use of other psychoactive substances including nicotine and alcohol has been prevalent among them. Nevertheless, incarceration provides an opportunity to encourage cessation and rehabilitation [23]. The prevalence of psychoactive substance use is higher among prisoners who suffer with self-inflicted injuries compared to others [24]. However, significant associations between substance use and history of trauma and non-communicable diseases were not observed among the prison inmates of the current study.

Proportion of prisoners with self-reported non-communicable diseases was higher than communicable diseases in this group. Psychiatric illnesses, diabetes mellitus, hypertension, asthma and ischaemic heart disease were found among considerable number of inmates. It has been revealed that the prevalence of non-communicable diseases and their risk factors were

on the rise among the general population as well as among prison population in the world [6, 23, 25]. There is a considerable proportion of inmates with psychiatric illnesses according to the findings of this study. The lifetime prevalence of mental disorders (such as depression, psychotic illnesses, drug and alcohol misuse) and liability to mental illnesses are high among the imprisoned population compared to general population [26]. Depressive illnesses of older prisoners are possibly due to their unmet health and social needs [27] and the mental disorders are common among criminal offenders who are being poorly attended [28].

We found a significant number of inmates with psychological stress according to the K10 scale. Prevalence of psychological stress is higher among the young prisoners according to the available literature [29]. There is an increased risk of self-harm and trauma or accidents among the prisoners probably due to their low emotional intelligence and inability in anger management [30]. Literature revealed that the offences of considerable number of inmates were an act to cause an injury or violence [31]. Hence, the prevalence of all forms of trauma is high and trauma stands as a significant health related issue in prison inmates. Therefore, easily accessible, expanded services to detect the presence of psychological disorders/stress among this vulnerable category are required.

Prevalence of communicable diseases was low in the group. This is possibly due to the fact that the accessibility to healthcare facilities/services was satisfactory. The availability of a Prison Hospital was important in reducing the spread of the common communicable diseases among the detainees.

The standards of available space and quarters and their maintenance were not reasonable inferred from the score of 6/15 for the domain assessing the space and quarters. It was the lowest score in the checklist to assess the environment and engineering standards [12]. However, the overall environment and engineering of the prison seems to be reasonable to keep the health of the detainees. Prisons are considered to be reservoirs of tuberculosis (TB) transmission due to various

limitations related to diagnosis, treatment and infection control measures. Therefore, the prevalence of TB is generally high among the detainees [32]. However, reported cases of smear-positive pulmonary tuberculosis (TB) were low in this prison. The strong infection control measures such as routine screening of contacts, patient isolation and direct observed treatment practice for TB may have led to the reduced rates. Existing survey findings have shown that the prevalence of communicable diseases such as human immunodeficiency virus (HIV), hepatitis B and parasitic infections are high among the prisoners compared to the general community [33, 34]. However, a recent Sri Lankan study has discovered that the prevalence of hepatitis B and C is low among prison inmates in two prisons in the country [35].

## CONCLUSIONS

Majority of the inmates were young, male skilled workers. There were significant numbers of inmates with a past history of tobacco, alcohol, heroin and cannabis use. The proportion of inmates with non-communicable diseases was higher compared to the proportion of inmates with communicable diseases. Prevalence of psychological stress and psychiatric illness was higher compared to other non-communicable illnesses. Living environment of the prison was at an acceptable level.

## RECOMMENDATIONS

A more comprehensive, multi-centered study is recommended to confirm the findings. Facilities for regular health screening and health education for behavioral change are important to improve the health of this disadvantaged population. A special attention is required to control the occurrence of non-communicable diseases among the inmates. It highlights the need of easily accessible counselling service within the prison premises. Regular screening of all inmates for psychological stress and psychiatric illnesses would be of benefit in the rehabilitation process.

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**Author's contribution:**

CMW- Study design, data analysis, manuscript writing

BDS, TN, RN- Study design, data collection and manuscript reviewing.

KPKG- Data entering and data analysis and manuscript reviewing.

**Declaration of Conflicting Interests**

Authors declare that they have no conflict of interest.

**Ethical consideration:**

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**Data Availability**

Data associated with the manuscript are available with the corresponding author on reasonable request.

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**REFERENCES**

- World Health Organization. "Good governance for prison health in the 21<sup>st</sup> century. A policy brief on the organization of prison health. 2013. Access from [https://www.euro.who.int/\\_data/assets/pdf\\_file/0017/231506/Good-governance-for-prison-health-in-the-21st-century.pdf](https://www.euro.who.int/_data/assets/pdf_file/0017/231506/Good-governance-for-prison-health-in-the-21st-century.pdf)
- Prison Statistics of Sri Lanka Web site. Access from <http://www.prisons.gov.lk/Statistics/statistic2014/Statistics-2013.pdf>.
- Aldridge RW, Story A, Hwang SW, Nordentoft M, Luchenski SA, Hartwell G, et al. Morbidity and mortality in homeless individuals, prisoners, sex workers, and individuals with substance use disorders in high-income countries: a systematic review and meta-analysis. *Lancet*. 2018;391(10117):241-50. doi: 10.1016/S0140-6736(17)31869-X.
- Galea S, Vlahov D. Social determinants and the health of drug users: socioeconomic status, homelessness, and incarceration. *Public Health Rep*. 2002;117 Suppl 1: S135-45.
- Dolan K, Wirtz AL, Moazen B, Ndeffo-Mbah M, Galvani A, Kinner SA, et al. Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees. *Lancet*. 2016; 388(10049):1089-102. doi: 10.1016/S0140-6736(16)30466-4.
- Herbert K, Plugge E, Foster C, Doll H. Prevalence of risk factors for non-communicable diseases in prison populations worldwide: a systematic review. *Lancet*. 2012; 379(9830): 1975-82. doi: 10.1016/S0140-6736(12)60319-5.
- Lukasiewicz M, Falissard B, Michel L, Neveu X, Reynaud M, Gasquet I. Prevalence and factors associated with alcohol and drug-related disorders in prison: a French national study. *Subst Abuse Treat Prev Policy*. 2007; 2:1.
- Beyen TK, Dadi AF, Dachew BA, Muluneh NY, Bisetegn TA. More than eight in every nineteen inmates were living with depression at prisons of Northwest Amhara Regional State, Ethiopia, a cross sectional study design. *BMC Psychiatry*. 2017; 17(1):31. doi: 10.1186/s12888-016-1179-9.
- Kouyoumdjian F, Schuler A, Matheson FI, Hwang SW. Health status of prisoners in Canada: Narrative review. *Can Fam Physician*. 2016; 62(3): 215-22.
- Barker DJP, Hall AJ. *Practical Epidemiology* 4 th ed. Edinburgh: Churchill Livingstone 1992; 65- 68.
- Grant JE, Atmaca M, Fineberg NA, Fontenelle LF, Matsunaga H, Janardhan Reddy YC, et al. Impulse control disorders and "behavioural addictions" in the ICD-11. *World Psychiatry*. 2014; 13(2): 125-27.
- Nembrini PG. Water, sanitation and habits in prisons international committee of the Red Cross ICRC, Geneva, 2013. (ICRC Publication Reference: 0823). Available at: <http://www.icrc.org/eng/resources/documents/publication/p0823.htm> 2005.
- Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SLT, et al. . Short screening scales to monitor population prevalence and trends in non-specific psychological distress. *Psychol Med*. 2002; 32: 959-76. doi: 10.1017/s0033291702006074.
- Wijeratne LT, Williams SS, Rodrigo MDA, Peris MUPK, Kawamura N, Wickremasinghe AR. Validation of the Kessler's psychological distress scale among the Sinhalese population in Sri Lanka. *South Asian Journal of Psychiatry*. 2012;2(2):.21-25.
- Sri Lanka Demographic Profile 2018. [http://www.indexmundi.com/sri\\_lanka/demographics\\_profile.html](http://www.indexmundi.com/sri_lanka/demographics_profile.html)
- Nowotny KM, Masters RK, Boardman JD. The relationship between education and health among incarcerated men and women in the United States. *BMC Public Health*. 2016;16(1):916. doi: 10.1186/s12889-016-3555-2.
- Hocking C. Working for citizenship: the dangers of occupational deprivation. *Work*. 2012; 41(4): 391-95. doi: 10.3233/WOR-2012-1316.
- Shehadeh A, Loots G, Vanderfaellie J, Derluyn I. The impact of parental detention on the psychological wellbeing of Palestinian children. *PLoSOne*. 2015;10(7): e0133347. doi: 10.1371/journal.pone.0133347. eCollection 2015.
- Martin MS, Dorken SK, Colman I, McKenzie K, Simpson AIF. The incidence and prediction of self-injury among sentenced prisoners. *Can J Psychiatry*. 2014;59(5):259-67. doi: 10.1177/070674371405900505.
- Porter LC, Bushway SD, Tsao H, Smith HL. How the US prison boom has changed the age distribution of the prison population. *Criminology*. 2016; 1-26. doi: 10.1111/1745-9125.12094
- Anthony ABH, Brunelle C. Substance use in incarcerated male offenders: Predictive validity of a personality

- typology of substance misusers. *Addict Behav.* 2016; 53: 86-93. doi: 10.1016/j.addbeh.2015.10.001.
22. Indig D, Wodak AD, Richmond RL, Butler TG, Archer VA, Wilhelm KA. Heroin use impairs smoking cessation among Australian prisoners. *BMC Public Health.* 2013; 13:1200. doi: 10.1186/1471-2458-13-1200.
23. Arnold FW. Non-communicable diseases in prisons. *Lancet.* 2012; 379(9830):1931-3. doi: 10.1016/S0140-6736(12)60471-1.
24. Matsumoto T, Yamaguchi A, Asami T, Okada T, Yoshikawa K, Hirayasu Y. Characteristics of self-cutters among male inmates: association with bulimia and dissociation. *Psychiatry Clin Neurosci.* 2005;59(3): 319- 26. doi: 10.1111/j.1440- 1819.2005.01377.x.
25. Rocca D. Prevalence of overweight and obesity in an Italian Prison and relation with average term of detention: a pilot study. *Ann Ig.* 2018; 20(1):51-56. doi:10.7416/ai.2018.2195.
26. Fazel S, Hayes AJ, Bartellas K, Clerici M, Trestman R. Mental health of prisoners: prevalence, adverse outcomes, and interventions. *Lancet Psychiatry.* 2016; 3(9):871-81. doi: 10.1016/S2215-0366(16)30142-0.
27. O'Hara K, Forsyth K, Webb R, Senior J, Hayes AJ, Challis D, et al. Links between depressive symptoms and unmet health and social care needs among older prisoners. *Age Ageing.* 2016;45(1):158-63. doi: 10.1093/ageing/afv171.
28. Gottfried ED, Christopher SC. Mental disorders among criminal offenders: A review of the literature. *J Correct Health Care.* 2017; 23(3): 336-46. doi:10.1177/1078345817716180.
29. Lyu SY, Chi YC, Farabee D, Tsai LT, Lee MB, Lo FE, et al. Psychological distress in an incarcerated juvenile population. *J Formos Med Assoc.* 2015; 114(11): 1076-1081. doi: 10.1016/j.jfma.2014.03.011.
30. Carli V, Mandelli L, Poštuvan V, Roy A, Bevilacqua L, Cesaro C, et al. Self-harm in prisoners. *CNS Spectr.* 2011; 16(3): 75-81. doi: 10.1017/s1092852912000211
31. Honorato B, Caltabiano N, Clough AR. From trauma to incarceration: exploring the trajectory in a qualitative study in male prison inmates from north Queensland, Australia. *Health Justice.* 2016;4: 3. doi: 10.1186/s40352-016-0034-x.
32. Dara M, Acosta CD, Melchers NVSV, Al-Darraj HAA, Chorgoliani D, Reyes H, et al. Tuberculosis control in prisons: current situation and research gaps. *Int J Infect Dis.* 2015; 32:111-7. doi: 10.1016/j.ijid.2014.12.029.
33. Bautista-Arredondo S, González A, Servan-Mori E, Beynon F, Juárez-Figueroa L, et al. A Cross-Sectional Study of Prisoners in Mexico City Comparing Prevalence of Transmissible Infections and Chronic Diseases with That in the General Population. *PLoS One* 2015; 10(7): e0131718. doi: 10.1371/journal.pone.0131718. eCollection 2015.
34. Vera-Remartínez EJ, Borraz-Fernández JR, Domínguez-Zamorano JA, Mora-Parra LM, Casado-Hoces SV, González-Gómez JA et al. Prevalence of chronic diseases and risk factors among the Spanish prison population. *Rev Esp de Sanid Penit* 2014;16(2):38-47. doi: 10.4321/S1575-06202014000200003.
35. Niriella MA, Hapangama A, Luke HP, Pathmeswaran A, Kurupparachchi KA, de Silva HJ. Prevalence of hepatitis B and hepatitis C infections and their relationship to injectable drug use in a cohort of Sri Lankan prison inmates. *Ceylon Med J* 2015;60(1):18-20. doi: 10.4038/cmj.v60i1