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Non-Communicable Disease Risk Profile Among Prison Staff in Sri Lanka: Evidence From a National Multi-Institutional Occupational Health Screening Study

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Abstract:

- ***Introduction:***

Occupational conditions of prison employees expose staff to considerable levels of psychosocial stress, shift work, continuous surveillance, incarceration overcrowding, occupational fatigue, and reduced health-promoting activities in lifestyle. Exposure to occupational hazards increases the probability of NCDs, yet the occupational safety and health of prison workers have not been studied adequately in low and middle income countries (LMICs). The current study investigates the prevalence of behavioral and metabolic risk factors of NCDs among prison staff of Sri Lanka.

- ***Method:***

An occupational health screening program performed among prison workers across the country in 2025 involved 19 prisons in Sri Lanka under the Director of Prison Health Services, covering all types of prisons in Sri Lanka. In total, 2,010 prison staff, representing 31.7% of the national prison workforce, received screening, including sociodemographic assessment, behavioral risk assessment, blood pressure determination, diabetes testing, lipids profile testing, renal function, oral health check-up, and breast examination for women prison workers. Descriptive epidemiological data analysis was used, with the following analytical approaches: prevalence estimates, subgroup comparison, and occupational health risks pattern detection.

- ***Results:***

Of prison workers screened, 82% were males, 18% were females, and 81% were 35 years old or above. The most prevalent behavioral risks were physical inactivity (73%), followed by alcohol intake (53%), smoking (24%), and betel chewing (22%) – all being primarily reported among males prison staff. Hypertension affected 26%, diabetes mellitus 14%, hyperlipidaemia 11%, elevated serum creatinine level 3.6% participants, and oral health disease was noted in 58% individuals. Among women, 16% of prison workers had abnormal breast findings. Clustered behavioral and metabolic risk factors appeared to be prevalent in participants aged over 35 and men prisoners. High prevalence of oral health problems was detected among male prison staff (65.7%). These oral health issues might be associated with smoking, betel chewing, and alcohol consumption. Moreover, abnormal breast findings were identified among 15.6% of prison females.

- ***Conclusion:***

Behavioral and metabolic risk factors of NCDs and chronic disease markers are prevalent among prison staff of Sri Lanka which suggests significant occupational health risks for prison workers. Occupational health screening programs, wellness programs at the workplace, psychosocial support initiatives, and health workforce policies should be implemented as a component of NCD control strategy.

Keywords: *Occupational Health; Prison Staff; Non-Communicable Diseases; Prison Health Systems; Workforce Health; Hypertension; Diabetes Mellitus; Sri Lanka.*

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I. INTRODUCTION

Non-communicable diseases (NCDs) account for about 74% of global deaths and are a major public health challenge worldwide (WHO, 2023). Cardiovascular diseases, diabetes, chronic respiratory diseases, cancer, and chronic kidney disease increasingly affect working-age populations, creating substantial health and economic burdens. Evidence shows that occupational factors such as chronic stress, shift work, inadequate sleep, sedentary behaviour, poor diet, substance use, and limited physical activity contribute to NCD risk (Marmot, 2005).

These risks are particularly relevant to correctional officers, who work in demanding environments characterized by constant vigilance, security pressures, overcrowding, uncertainty, emotional strain, and limited autonomy. Such conditions may promote unhealthy behaviours and increase the risk of hypertension, obesity, cardiovascular disease, burnout, substance use, and mental health problems (Kinman et al., 2017; Obidoa et al., 2011). Despite growing interest in prison health, the occupational health of correctional staff remains under-researched, especially in low- and middle-income countries (LMICs). In Sri Lanka, prison officers play a vital role in maintaining institutional security and prisoner welfare, yet systematic occupational health monitoring has been limited.

To address this gap, the Directorate of Prison Health Services launched an occupational health screening program in 2025 to assess NCD risk factors among prison staff. This study presents the program findings and their implications for occupational health policy and prison health services.

➢ *Conceptual Framework:*

The conceptual framework for this study integrates occupational stress theory, behavioural risk pathways, and health systems perspectives.

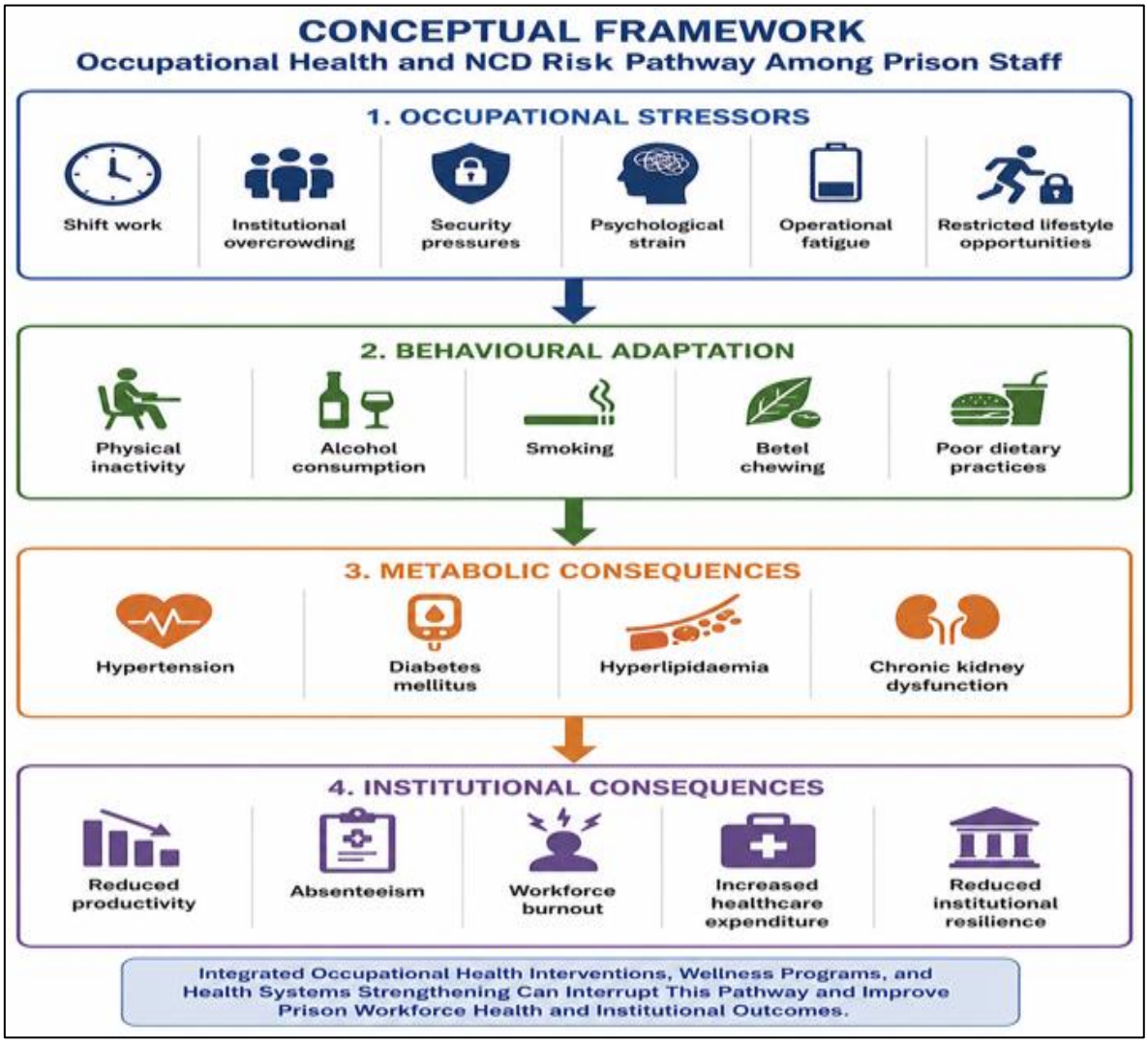

Fig 1 Conceptual Framework

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➢ *Objectives*

- *General Objective:*

To assess the burden of behavioural and metabolic NCD risk factors among prison staff in Sri Lanka and examine implications for occupational health policy and prison health systems strengthening.

- *Specific Objectives:*

✓ To determine the prevalence of behavioural NCD risk factors among prison staff.
✓ To assess the prevalence of hypertension, diabetes mellitus, hyperlipidaemia, and renal dysfunction.
✓ To identify gender-related differences in occupational risk patterns.
✓ To assess oral and breast health outcomes among prison staff.
✓ To evaluate implications for occupational health governance and prison workforce wellbeing.

II. METHODOLOGY

➢ *Study Design:*

National cross-sectional occupational health screening programme was conducted during the year 2025.

➢ *Study Setting:*

The study was conducted in 19 prison institutions which are supervised by the Directorate of Prison Health Services and Ministry of Health, Sri Lanka.

➢ *Study Population:*

Prison staff aged between 20-60 years, working within the Sri Lankan prison system constituted the target population.

➢ *Sample Size and Coverage:*

2,010 prison staff participated in the screening programme, which is about 31.7% of the total number of prison staff in Sri Lanka (N = 6,332).

➢ *Inclusion Criteria*

- Prison staff aged 20-60 years
- Available during screening visits
- Informed consent

➢ *Screening Components:*

- *Behavioural Assessment*

✓ Smoking habits
✓ Drinking alcohol
✓ Chewing betel nut
✓ Physical activity patterns

- *Clinical and Biochemical Assessment*

✓ Blood pressure measurement
✓ Diabetes screening
✓ Lipid profile assessment
✓ Nephrology assessment

- *Preventive Health Assessment*

✓ Mouth examination
✓ Breast examination of female staff

➢ *Data Collection:*

Information was gathered using structured occupational health screening forms filled by healthcare workers.

➢ *Data Analysis:*

Analysis of data included descriptive statistics based on prevalences, sub-group analyses and occupational risks analysis.

➢ *Ethical Issues:*

Approval of ethics was gained according to Ministry of Health protocol. Informed consent was obtained from all participants.

III. RESULTS

➢ *Sociodemographic Characteristics*

Table 1 Sociodemographic Characteristics of Screened Prison Staff (N = 2,010)

Variable	Frequency (n)	Percentage (%)
Male	1,648	82.0
Female	362	18.0
Age 20–34 years	382	19.0
Age 35–44 years	911	45.3
Age 45–60 years	717	35.7
Total	2,010	100

The screened population was predominantly male and consisted largely of mid-career staff aged ≥35 years.

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➢ *Behavioural NCD Risk Factors*

Table 2 Behavioural Risk Factors Among Prison Staff

Risk Factor	Male (%)	Female (%)	Overall (%)
Physical inactivity	74	68	73
Alcohol use	62	11	53
Smoking	29	1	24
Betel chewing	26	3	22
Multiple risk behaviours	38	9	33

Physical inactivity represented the most prevalent behavioural risk factor among both male and female prison staff.

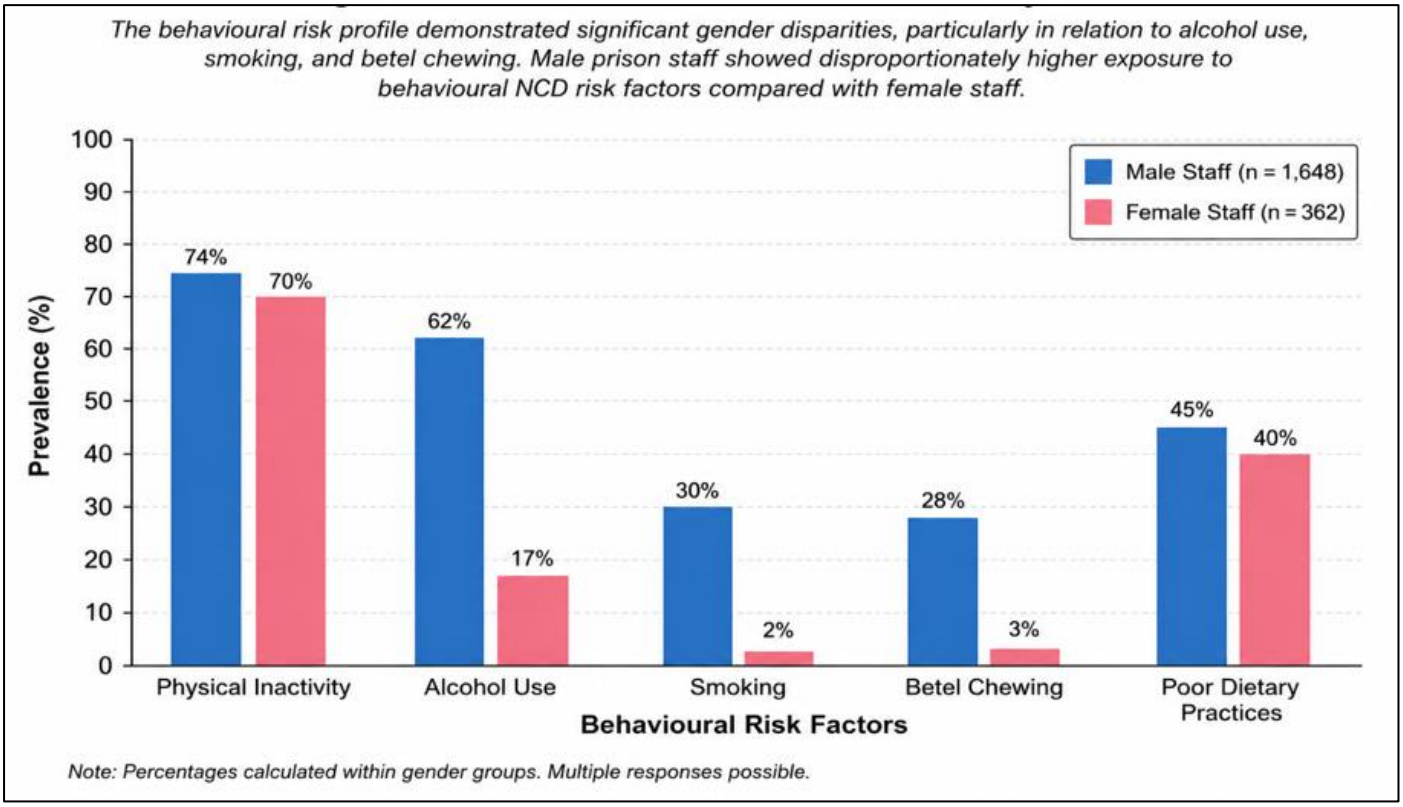

Fig 2 Behavioural Risk Factor Prevalence by Gender

The behavioural risk profile demonstrated significant gender disparities, particularly in relation to alcohol use, smoking, and betel chewing. Male prison staff showed disproportionately higher exposure to behavioural NCD risk factors compared with female staff.

➢ *Burden of Chronic Disease Indicators*

Table 3 Prevalence of Chronic Disease Indicators Among Prison Staff

Clinical Indicator	Prevalence (%)
Hypertension	26
Diabetes mellitus	14
Hyperlipidaemia	11
Elevated serum creatinine	3.6
Oral health disease	58
Abnormal breast findings (female staff)	16

Hypertension represented the most prevalent chronic metabolic condition identified during screening.

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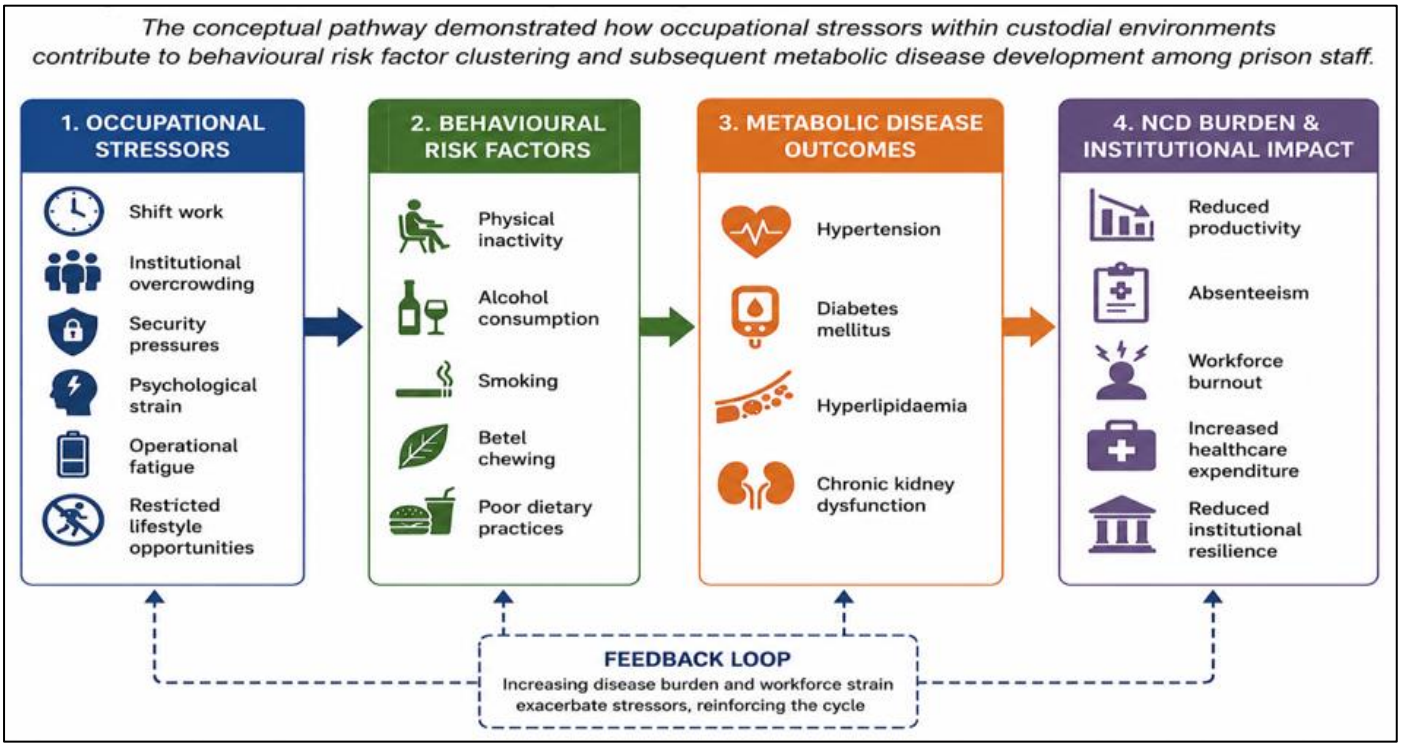

Fig 3 Occupational Pathway Linking Custodial Work Environment to NCD Burden

The conceptual pathway demonstrated how occupational stressors within custodial environments contribute to behavioural risk factor clustering and subsequent metabolic disease development among prison staff.

➢ *Oral and Breast Health Findings*

Table 4 Oral and Breast Health Findings

Condition	Male (%)	Female (%)
Oral health issues	65.75	20.00
Abnormal breast findings	–	15.63

A high burden of oral health problems was observed among male prison staff (65.7%), likely associated with smoking, betel chewing, and alcohol use. Additionally, abnormal breast findings were identified in 15.6% of female staff, indicating the need for further clinical evaluation and referral.

IV. DISCUSSION

This study provides valuable evidence as one of the largest studies ever performed on occupational health among prison staff in a low- and middle-income country. This study has shown the presence of a high burden of behavioral and metabolic NCD risk factors among prison staff in Sri Lanka.

Physical inactivity among prison staff observed in this study can be explained by evidence on the link between custody occupation and sedentary behavioral pattern and occupational fatigue (WHO, 2021). The restriction of mobility, performing administrative functions, experiencing operational fatigue, and non-standard work schedule can explain the lower levels of physical activity among prison staff.Alcohol consumption, smoking, and betel chewing are prevalent behaviors among male prison staff. Such practices may have served as maladaptive coping techniques used by prison staff because of their work environment associated with constant stress and emotional tension (Obidoa et al., 2011).

The prevalence of such diseases as hypertension and diabetes mellitus among prison workers indicates substantial risks related to cardiovascular and metabolic disease development. Constant occupational stress is linked to the activation of the neuroendocrine system resulting in the formation of hypertension, insulin resistance, dyslipidemia, and cardiovascular disease (Marmot, 2005).The results of the study provide additional proof of theories of occupational stress described by Karasek (1979) and Siegrist (1996). According to them, working in high-pressure environments negatively influences employee physical and psychological well-being.

Prevalence of oral health diseases among a large number of prisoners underlines the problem with inadequate preventive healthcare services provided to them. A high level of oral health disorders was found in male prison staff (65.7%), and it may be explained by smoking, betel chewing, and alcohol consumption. Moreover, abnormal breast

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findings were identified in 15.6% of female staff members, indicating the need for further clinical assessment and referral. These findings emphasize the necessity to develop integrated occupational health care services within prison institutions.

The clustering of behavioural and metabolic risk factors suggests that prison workforce health should be considered not only as an individual behavioural issue but also as a broader occupational health and institutional governance concern.

V. CONCLUSION

Workers employed in prisons in Sri Lanka present an example of an occupationally vulnerable population with significant exposure to behavioral and metabolic NCD risk factors. The combination of occupational stress, unhealthy behavioral adaptations, and lack of workplace wellness measures may be the cause of higher rates of chronic disease burden.

Healthcare professionals need to focus on strengthening occupational health policies in prisons based on institutionalized preventive screening, workplace wellness programs, integrated psychosocial services, and development of an evidence-based policy for prison worker health. A high level of oral health disorders was found in male prison staff (65.7%), and it may be explained by smoking, betel chewing, and alcohol consumption. Moreover, abnormal breast findings were identified in 15.6% of female staff members.

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