

Health Risk Behaviors and Chronic Health Diseases Among Incarcerated Women at Central Jail

Pirah Zardari¹, Allah Wadhayo Kalo², Shoukat Ali Panhwar³, Kulsoom Jawed⁴, Jai DevMaheshwari⁵, Aqeela Memon⁶

^{1,2}Lecture, community Medicine
LUMHS/Jamshoro

³Assistant DHO, Hyderabad Sindh

⁴Assistant Professor, Department of
Community Medicine, SRMC, Tando
Adam

⁵Assistant Professor of Community
medicine SMBMC Lyari Karachi

⁶Assistant Professor of Community
Medicine SRMC Tando Adam

Author's Contribution

^{1,2} Substantial contributions to the
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the acquisition, ³Drafting Critical
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Correspondence

*E: pirahzardari@gmail.com

ABSTRACT

Objective: To determine the health risk behaviors and chronic health conditions among incarcerated women at central jail Karachi.

Methodology: This descriptive cross-sectional study was conducted at department of community medicine LUMHS from May 2024 to October 2024, on incarcerated women recruited through consecutive sampling. The data were collected using a structured interviewer-administered questionnaire assessing socio-demographic characteristics, health risk behaviors, and chronic diseases. The chronic diseases were evaluated through self-reported physician diagnosis, medical record review, and objective clinical measurements including blood pressure, fasting blood glucose, BMI, asthma, arthritis and HCV infection. Data were analyzed using SPSS version 26.0.

Results: Most of the incarcerated women were aged 28–37 years (39.9%) and had normal BMI (58.7%), though 26.8% were overweight or obese. Mostly women were married (58.0%) and had been incarcerated for less than one year (53.6%). Accordant health risk behaviors, mosquito exposure (60.9%), cigarette smoking (16.7%), physical inactivity (16.7%), bullying (8.0%), drug misuse (7.2%), physical assault (7.2%), and sexual abuse (2.2%) were the most commonly reported. The, 35.5% reported at least one chronic condition, most commonly diabetes-hypertension combination (7.2%), arthritis-hypertension (6.5%), diabetes alone (5.1%), and asthma (3.6%), while the chronic disease burden showed no statistically significant association with duration of incarceration ($p=0.094$).

Conclusion: The incarcerated women carry a substantial burden of health risk behaviors and chronic diseases within critically under-resourced custodial environments, requiring urgent implementation of gender-responsive healthcare programmes and evidence-based prison health reforms.

Key words: Women prisons, Health, Chronic diseases, Risk behaviors.

Introduction

The global female prison population has undergone a dramatic and sustained expansion over recent decades, constituting a public health emergency that continues to receive inadequate institutional attention. The US accounts for just four percent of the women yet holds one-quarter of all women incarcerated worldwide, with the incarceration rates of the women at near-historic highs. This demographic trajectory mirrors a global pattern: the incarceration rate of women rose by around 60% between 2000 and 2022, contrasted to only a 22% rise in the male prison population, with more than 740,000 women incarcerated across correctional systems throughout the world.^{1,2}

The prison situation interferes with the health conditions of incarcerated people, particularly women.^{3,4} Compared with other populations, people that have lost their freedom are

disadvantaged regarding physical, social and mental health, becoming more susceptible. A significant number of inmates housed in these custody facilities have poor histories of prevention and primary care health services and develop acute or chronic morbidities.^{3,5} According to a survey, approximately 60% had chronic medical conditions, 59% met diagnostic criteria for substance use disorders, and 69% reported a history of mental health problems.⁶

The trauma histories and abuse, including intimate partner violence, are also demonstrated at even higher rates in this population. Furthermore, the majority of incarcerated women are of reproductive age, presenting healthcare needs that correctional settings are often ill-equipped to address, underscore the urgent need for gender-responsive correctional health policies that adequately meet the specific

healthcare needs of incarcerated women.^{6,7}

Importantly, women in jail carry a significantly higher prevalence of the chronic medical conditions, including hypertension, diabetes, arthritis, asthma, and hepatitis, with gender differences persisting even after adjustment for socio-demographic factors.⁸ According to Brazilian study on incarcerated women found that women under 30 years of age in prison had a prevalence of hypertension 4.5 times greater, cardiovascular disease 4.4 times more and asthma 3.0 times higher compared to the age matched women in the general population, reflecting an alarming acceleration of chronic disease among young incarcerated females.⁹ According to correctional settings, medications for chronic diseases are used far less often compared to the general population, as well as the rates of treatments are around 2.9 times lower for diabetes, 5.5 times lower for asthma, and 2.4 times lower for hypertension, indicating that the diagnosis does not necessarily lead to proper disease management.¹⁰ In the meantime, HCV prevalence in Pakistani prisons very high, driven by injecting drug use and high-risk sexual behaviors operating within overcrowded and the poorly monitored facilities.¹¹ Generally women face a severe, multilayered, and chronically undertreated burden of chronic diseases that is inextricably linked to their health risk behaviors and structurally substandard prison environments.

The health risk behaviors are both frequent and multifaceted in this population, frequently predating incarceration and being exacerbated by the environment of prison. Based on meta-analyses, the prevalence of mental illness, substance misuse, and infectious diseases among people in prisons worldwide is at least twofold higher compared to community-based populations.¹² Numerous factors contribute to the elevated prevalence of chronic diseases among incarcerated women, including metabolic syndrome, and tobacco use, all further compounded by imprisonment-associated weight gain and enforced sedentary behavior. A systematic review and meta-analysis confirmed that the prevalence of overweight and obesity among incarcerated women was significantly higher than national population norms, with a risk

difference of +11.7% overall and reaching +35.1% in low- and middle-income nations.¹³ However the structural characteristics of incarceration environment serve as powerful amplifiers of these conditions: incarcerated women are routinely exposed to ultra-processed foods, limited education of nutrition, and restricted living conditions that accelerate cardiovascular risk, whereas opportunities for physical activity remain limited by systemic factors.¹⁴

In spite of the volume of evidence documenting poor health outcomes in prison populations broadly, research focused specifically on the intersection of health risk behaviors and chronic disease among incarcerated women remains very limited specifically In developing countries where women face a uniquely compounded vulnerability shaped by pre-existing poverty, limited education, histories of gender-based violence, and structurally deficient correctional health systems. Though the incarceration rates for women continue to rise rapidly, the health needs of women in custody are consistently overlooked, and the existing literature remains insufficient to inform targeted clinical responses and policies. Concentrating on this evidence gap is a matter of both clinical urgency and the human rights. However, this study therefore aims to determine the prevalence of key health risk behaviors and h chronic health diseases among incarcerated women, with the purpose of creating evidence to guide gender-responsive correctional health policy and interventions.

Methodology

This descriptive cross sectional study was carried out at department of community medicine LUMHS. The respondent of this study were selected from central jail Karachi. This study was conducted during 6 months from May 2024 to October 2024. All the women aged ≥ 18 years incarcerated, serving a confirmed sentence or remanded in custody for a minimum period of two month or more at the time of study, with or without a previously diagnosed chronic disease and women willing to provide written informed consent voluntarily and independently were included. All the women inside for fewer than

eight weeks, with severe psychiatric disorder, or significant cognitive impairment, pregnant women, women critically ill, hospitalized, or medically unstable at the time of study and those who declined to provide informed consent were excluded. The consecutive sampling technique was employed to recruit all eligible incarcerated women meeting the predefined inclusion criteria during the study period. A structured, questionnaire was used as the primary data collection tool. The questionnaire was designed to cover key aspects related to the study objectives, including access to experiences of health risk behaviors like smoking, drug use, and physical activity, as well as social support and reintegration planning. The chronic diseases were assessed through self-reported physician-diagnosed conditions, medical record review, and clinical measurements. Hypertension was defined as blood pressure $\geq 140/90$ mmHg or current antihypertensive use, and diabetes mellitus as fasting blood glucose ≥ 7.0 mmol/L or antidiabetic medication uses, the body mass index (BMI) was calculated from measured height and weight, with overweight defined as ≥ 25 kg/m² and obesity as ≥ 30 kg/m², while the asthma, arthritis and HCV infection status were confirmed through self-reported physician diagnosis supported by medical records. To ensure accurate and reliable data, the questionnaire was administered through face-to-face interviews conducted by the researcher.

Before the data collection, participants were briefed about the objective of study and assured of their confidentiality. The interviews were conducted in a private setting within the prison facility to encourage honest responses and minimize any potential influence from prison staff or fellow prisoners. To maintain ethical standards, participation was voluntary, and respondents were given the right to withdraw at any stage without any consequences. Subsequently the collected data was later analyzed to identify patterns of health risk behaviors, and chronic medical disorders. The data was compiled with proper coding in Microsoft Excel to be further analyzed in Statistical Package for Social sciences for windows (SPSS) version 25.

Results

The 138 incarcerated women were enrolled in this study, with majority (39.9%) were in the age group of 28–37 years, followed by (25.4%) in age group of 18–27 years, (23.9%) in 38–47 years, (8.7%) in 48–60 years and only 2.2% were above 60 years old. According to BMI, 15.2% women were overweight (25–30 kg/m²), 11.6% were obese (above 30 kg/m²), and 14.5% were underweight. Most of the women were married (58.0%), followed by separated (18.8%), single (17.4%), widowed (5.1%), and divorced (0.7%), while with respect to duration of incarceration, more than half of the women (53.6%) had been incarcerated for less than one year, 29.7% for 1–5 years, 10.9% for 6–10 years, and only 5.8% had been imprisoned for more than 10 years, indicating the sample predominantly comprised recently incarcerated individuals, as shown in table I.

Variables		n	%
Age groups	18-27 years	35	25.4
	28-37 years	55	39.9
	38-47 years	33	23.9
	48-60 years	12	8.7
	>60 years	03	2.2
BMI	Below 18 kg/m ²	20	14.5
	18-24 kg/m ²	81	58.7
	25-30 kg/m ²	21	15.2
	Above 30 kg/m ²	16	11.6
Marital status	Single	24	17.4
	Married	80	58.0
	Divorced	01	0.7
	Widow	07	5.1
	Separated	26	18.8
Duration of incarceration	<1 year	74	53.6
	1-5 years	41	29.7
	6-10 years	15	10.9
	> 10 years	8	5.8

Most of the women (60.9%) reported mosquito exposure within prison, reflecting substandard environmental conditions, smoking was reported by 16.7% women, while illegal drug or prescription medication misuse was reported by 7.2%, predominantly involving methamphetamine, opioids, and cocaine.

Physical assault history was in (7.2%) women, intimidation (8.0%), and sexual abuse (2.2%) were also documented, while according to

Table II: Health risk behaviors in incarcerated women. (n=138)

Health Risk Behaviors in incarcerated women		n	%
Over past six month, have you experienced mosquitoes in prison?	Yes	84	60.9
	No	54	39.1
Do you currently smoke cigarettes?	Yes	23	16.7
	No	115	83.3
Have you experience bullying during incarceration?	Yes	11	8.0
	No	127	92.0
Have you been victim of sexual abuse in prison?	Yes	3	2.2
	No	135	97.8
Have you experience anybody hitting you?	Yes	10	7.2
	No	128	92.8
Do you use any illegal drugs or misused prescription medications?	Yes	10	7.2
	No	128	92.8
If yes, specify the type of drug	Methamphetamine	2	1.4
	Opioids	2	1.4
	Cocaine & Opioids	2	1.4
	Others	4	2.9
Do you engage in moderate physical activity?	Yes	115	83.3
	No	23	16.7
If yes, how many times in a week	1-2 days	64	46.4
	3-4 days	39	28.3
	> 5 days	12	8.7

physical activity, 83.3% reported engaging in moderate physical activity, though mostly at low frequency (1–2 days/week, 46.4%), with 16.7% reporting complete physical inactivity, as shown in table II.

Overall among the incarcerated women, 35.5% reported having at least one chronic health condition, while 64.5% had no chronic illnesses. The most commonly reported conditions included diabetes (5.1%), hypertension (3.6%), and a combination of both (7.2%). Arthritis was present in 4.3% of women, while 6.5% had both arthritis and hypertension. Asthma was reported by 3.6%, and 1.4% had multiple conditions. Table III

Table III: Chronic health conditions among incarcerated women. (n=138)

Chronic health conditions		n	%
Yes	Diabetes	7	5.1
	Hypertension	5	3.6
	Diabetes & Hypertension	10	7.2
	Arthritis	6	4.3
	Arthritis & Hypertension	9	6.5
	Asthma	5	3.6
	Asthma, Diabetes, Hypertension & Arthritis	2	1.4
	Other	5	3.6
No		89	64.5
Total		138	100.0

Among 49 incarcerated individuals, the most common chronic conditions not statistically significant according duration of incarceration ($p = 0.094$). Table IV

Discussion

The situation of the women in prison in developing countries is quite problematic in terms of their health status, social experiences and institutional care,¹⁵¹⁶ including in Pakistan. Present study provides a comprehensive understanding of the socio-demographic, health risk behaviors and chronic medical conditions among incarcerated women in Pakistan. The study shows that most of the female prisoners are aged 28–37 years (39.9%), followed by those aged 21–27 and 48–57 years. This aligns with a study carried out in India, where 90% of the women in prison were in childbearing age.¹⁷

The marital status of the these women in this study was aligns with a national study, where married women were found to be the predominant group in prisons, often due to offenses related to domestic disputes or economic vulnerabilities.¹⁸ However the rate of illiteracy among incarcerated women in this study was found alarmingly high. Consistently the Hassan SS et al¹⁹ reported that the, the most of the incarcerated women are married or divorced and largely illiterate. The findings of this study showed that 53.6% of the incarcerated women had less than one year

duration and 5.8% were incarcerated were from more than 10 years. In Pakistan, the proportion

Table IV: Frequency of chronic health conditions according to duration of incarceration. (n=49)						
Chronic health conditions	Duration of Current Incarceration:				Total	p-value
	<1 year	1-5 years	6-10 years	>10 years		
Diabetes	5	1	0	1	7	0.094
	10.2%	2.0%	0.0%	2.0%	14.3%	
Hypertension	0	5	0	0	5	
	0.0%	10.2%	0.0%	0.0%	10.2%	
Diabetes & Hypertension	8	1	1	0	10	
	16.3%	2.0%	2.0%	0.0%	20.4%	
Arthritis	4	0	1	1	6	
	8.2%	0.0%	2.0%	2.0%	12.2%	
Arthritis & Hypertension	4	3	2	0	9	
	8.2%	6.1%	4.1%	0.0%	18.4%	
Asthma	3	2	0	0	5	
	6.1%	4.1%	0.0%	0.0%	10.2%	
Asthma, Diabetes, Hypertension & Arthritis	0	1	1	0	2	
	0.0%	2.0%	2.0%	0.0%	4.1%	
other	3	1	1	0	5	
	6.1%	2.0%	2.0%	0.0%	10.2%	
	27	14	6	2	49	
	55.1%	28.6%	12.2%	4.1%	100.0%	

of short-term incarceration could be attributed to the practice of pretrial detentions, which can keep women incarcerated for long periods of time without a conviction.²⁰ It's not the same as in the West where non-violent women who commit crimes have more alternative sentencing options like probation or community service.

In this study, 35.5% of incarcerated women reported at least one chronic health condition, specifically diabetes (5.1%), hypertension (3.6%), and arthritis (4.3%) among the most commonly reported chronic diseases, while both diabetes and hypertension (7.2%) and arthritis with hypertension (6.5%). In aligns to this study a study on incarcerated women in Bangladesh found a high prevalence of diabetes and hypertension due to poor diet and inadequate health related facilities.²¹ Whereas, when compared to US prison populations, the prevalence of chronic diseases was lower compared to our findings. Consistently Bai JR et al²² reported higher frequency of respiratory (34.1%), cardiovascular (17.4%), and sexually transmitted diseases (16.1%) at the point of prison entry, with the female inmates had higher risk for almost all chronic conditions in contrasted to male population, underlining that incarcerated women arrive at correctional facilities already carrying a disproportionate disease burden, which is some different to this study, because we did not assessed the women at arrival time.

According to another study by Türkmenoğlu B et al²³ demonstrated asthma 47.2%, hypertension

22.5%, and diabetes 9.1% among female inmates. Parallel to our findings in a health review demonstrated that the women in jail had higher prevalence compared to men for hypertension, diabetes, arthritis, asthma, hepatitis, and the cirrhosis of liver.²⁴ Difference in the frequency of chronic disease across the studies may because the differences in study objectives, sample sizes, sample selection criteria of the studies, diagnostic definitions, availability and quality of correctional healthcare facilities, proportion of newly versus long-term incarcerated women, and the healthcare context of the countries in which the studies were done.

Moreover, in this study 14.5% of incarcerated women were underweight, while 26.8% were overweight or obese. This is consistent with research from India, where similar nutritional disparities were detected.²² Conversely, studies from Western countries presented higher obesity rates among incarcerated women, potentially due to different dietary habits and lifestyle factors. Consequently, the higher underweight prevalence in this study suggests that malnutrition remains a pressing issue in Pakistani prisons, demanding a better dietary pattern.

Moreover, in this study according to the health risk behaviors 16.7% of incarcerated women had smoking history, 8% experienced bullying, and 2.2% were victims of sexual abuse. The figures were lower than those reported in studies done in the U.S. and Latin America, where rates of

substance abuse, bullying, and sexual abuse are significantly higher.²⁵ comparatively, a large female female-prisoner study showed that the 92% cases in prison were sedentary and 92% reported poor diets, indicating a heavy lifestyle risk profile that can worsen chronic diseases like 51% had sexually transmitted diseases symptoms, 7.4% had leprosy, syphilis was in 11.7% cases and HIV was positive in 2.3% of the cases.²⁶ The findings collectively underscore the pressing need for health systemic changes within the Pakistani criminal justice system to address the health challenges faced by female prisoners. By focusing on preventive measures, legal reforms, and psychological support, it is possible to create a more equitable environment that reduces the incarceration rates of women and facilitates their successful reintegration into society.

Overall it has been noted that these findings reflect major health-care deficiencies that cannot be fully addressed based on this small sample size and several study limitations, like the women were not assessed for other infective and sexually transmitted diseases, metabolic syndrome, and several other important health issues. Therefore, it is essential to evaluate these cases on a larger scale, with the additional inclusion of women's perceptions of their health problems, to generate stronger evidence and improve health strategies

such as improved healthcare access, routine screening for chronic, infectious and sexually transmitted diseases, hygienic and nutritional improvements, and health related awareness programs.

Conclusion

There was observed a significant burden of health risk behaviors and chronic diseases among incarcerated women, indicating the urgent need for gender-responsive correctional healthcare. The prison environment itself compounds pre-existing health vulnerabilities through substandard hygiene, limited care of prevention, physical inactivity, violence exposure, and inadequate nutrition, collectively accelerating the development of chronic non-communicable diseases. The prison-based health facilities are currently inadequately equipped to meet the complex health needs of incarcerated women. There is need of implementation of evidence-based, gender-responsive health programmes within Pakistani prisons, encompassing routine chronic disease screening, substance use management, nutritional support, and abuse protections. Further large-scale studies are needed to more correctly explore the health issues in this population.

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