Original Article

Determinants of Depression in Jail Environment: A Cross-Sectional Study of Female Prisoners in Lahore, Pakistan

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Abstract

Background: Depression among female prisoners remains unexplored in Pakistan, particularly regarding how prison environment and other factors interact as determinants, requiring context specific evidence to inform targeted mental health interventions.

Objectives: The study investigates the frequency of depression among female prisoners in Kot Lakhpat Jail, Lahore, Pakistan and examine factors associated with depression including the jail environment.

Methods: This cross-sectional study was conducted at Kot Lakhpat Jail, Lahore, Pakistan with female inmates residing in jail. The duration of study was three months from 1st May to 31st July 2023. Non-probability convenience sampling technique was used to recruit the participants. With Institutional Review Board approval, 104 willing participants were surveyed using PHQ-9 scale. The demographic variables and depression level were analyzed using SPSS 28.

Results: The statistical analysis revealed that 16.3 % of females exhibited minimum depression while 6.7% suffered severe depression. Higher education levels ((OR = 1.167, p = 0.030)) and low (OR = 4.221, p = 0.048) and moderate social support (OR = 3.219, p = 0.041) as significant determinants increasing odds of depression. Being a convicted prisoner decreased the odds of depression. Logistic Regression identified significant determinants of depression associated factors.

Conclusion: The study reveals higher education levels and low to moderate social support as significant determinants of depression requiring targeted interventions. These interventions include vocational training, advanced teaching programs, teaching and learning opportunities, peer support groups, library access, skill development and recreational activities. Cognitive behavioral therapy services are required for ongoing support for female prisoners.

Keywords: Female Prisoners, Depression, Jail Environment, Social Support, Education, Cognitive Behavioral Therapy

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Introduction

Mental health disorders are a public health concern in every country in the world and Pakistan is no exception. An estimated 450 million people worldwide are affected by mental illnesses. These illnesses have been reported to be significantly more prevalent among prisoners.[1] Captivity in jail significantly affects the psychological health of the individual who is imprisoned. According to the American Psychological Association (APA), inmates have a higher prevalence of significant mental illness (10-20%) than the general public (5%).[2] Mood disorders, anxiety disorders, and post-traumatic stress disorder are widespread among convicts. These mental disorders could be pre-existing or develop after confinement. Among these, depressions is a complex mental health condition characterized by persistent feelings of sadness, hopelessness, and disinterest in once pleasurable activities. Within the carceral context, the manifestation of depressive illness may be linked to various factors unique to the prison environment.[3] The jail environment presents a range of challenges that can severely impact mental health. The limited social interaction, enforced solitude, and overcrowding can make inmates feel isolated and deprived of privacy. Hostile interactions and uncertainty about the future further exacerbate stress and anxiety. Additionally, inadequate access to quality healthcare can prevent individuals from receiving the necessary support to cope with these conditions, contributing to the development of mental health issues.[4]

Many studies are undertaken to analyze mental morbidities and their causes among detainees in jails in the western world. It is unknown whether these findings can be translated to our parts of the world, such as Pakistani detention jails.[5] Suicide is the primary cause of death among prison inmates, with

approximately 33% reporting lifetime attempts at self-harm and 20% intending suicide. Furthermore, depression is the most common cause of mental impairment among prisoners, roughly about 18% of all cases.[6] Prisoners with psychiatric problems should have access to mental health care and assistance throughout the criminal justice system.[7] Many prisons, particularly in underdeveloped nations, lack timely diagnosis and rehabilitation. However, there has been minimal research into common mental illnesses and associated factors among prisoners in low- and middle-income countries.[8] The study investigates the frequency of depressive illness among female prisoners in Kot Lakhpat Jail, Lahore, Pakistan.

It aims to explore the extent of depression, determinants of depression and the association of the jail environment with depression in female prisoners. Although scarce literature about depression in male prisoners is available in our context but literature on depression in female prisoners in Pakistan yielded a gap. So, this study will address this considerable gap in existing knowledge. This study endeavors to contribute to the discourse on mental health within correctional settings, advocating for the implementtation of targeted interventions to address the specific needs of incarcerated women struggling with depressive illnesses. The findings of study will have implycations not only for the improvement of mental health services within Kot Lakhpat Jail but also for informing broader policy reforms concerning mental health care across Pakistan. Recognizing and addressing the mental health needs of incarcerated women is not only a matter of human rights but also a fundamental step toward fostering rehabilitation, reducing recidivism, and promoting societal reintegration upon release.

Methods

This research employed a cross-sectional study design to achieve the objectives of assessing the frequency of depression among female prisoners in Kot Lakhpat Jail, Lahore, Pakistan, and identifying determinants and factors associated with depression. After obtaining approval from the Institutional Review Board of Rashid Latif Medical College, Lahore (Ref no. IRB/2023/086) as well as permission from jail authorities, the study was conducted at Kot Lakhpat Jail, Lahore, Pakistan, for three months from 1st May to 31st July 2023 employing non-probability convenience sampling. Inclusion criteria encompassed female prisoners of Kot Lakhpat Jail, Lahore, Pakistan. Exclusion criteria included female prisoners unwilling to participate in interviews and female prisoners in locked up cells (due to administrative restriction on access); however, this may have limited representation of the most severely affected inmates. A total of 104 females, who were eager to talk, were included in the study. Written informed consent was obtained. The sample size was calculated using single proportion formula, taking the prevalence of depression (p=16.1%) from a previously published study with q=1-p, a 5% margin of error (d=0.05) and 95% confidence level (Z=1.96).[3]

Data was collected using proformas covering sociodemographic characteristics (age, educational status, marital status, family income, imprisonment characteristics, living conditions inside the jail, habits, and social support). The open-access questionnaire of the PHQ-9 scale, available in Urdu and English, was employed to measure depression. The validated Urdu translation of PHQ-9.[9] was utilized to interview the female population of the jail. The authors filled out proformas to ensure data quality, integrity, and confidentiality. Data collection took approximately 15 minutes per participant, with no incentives provided.

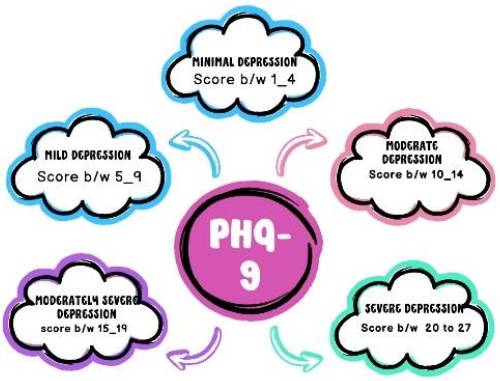


Figure 1: *Details of Patient Health Quality Scale-9*

The acquired data was entered into SPSS 28 for subsequent in-depth analysis. To enhance the interpretability of the data, the classification of the jail environment underwent a re-categorization into three levels: bad (encompassing bad and very bad), moderate (equivalent to moderate), and good (encompassing good and very good). In alignment with established conventions, the depression variable was systematically re-categorized into depressed and not-

depressed categories to facilitate regression analysis. The depression categories are shown in Figure No. 1. Binary logistic regression analysis was applied to determine determinants of depression. The assessment involved calculating odds ratios along with 95% confidence intervals, using a significance threshold of P value less than 0.05 to ascertain the factors significantly associated with depression. Binary logistic regression was performed to identify factors independently associated with depression. The study adhered to ethical principles, respecting prisoners' dignity, autonomy, and confidentiality, with information used solely for research purposes.[10] We ensured that the research will contribute to the well-being of participants and the broader community, with the potential to improve mental health support for incarcerated women. The data will not be utilized for commercial purposes or personal benefit.

Results

The analysis revealed that variations were observed in marital status and number of children among participants. Most of the female prisoners were single (88%), urban dwellers (81.7%) with mostly accused status of imprisonment (63.5%). Out of the total sample, 30 individuals (28.8%) had 2 children. In contrast, 6 children was the least common category (n=2, 1.9%). Other demographic variables of this study are shown in Table 1.

Table 1: *Socio-Demographic Characteristics of Female Prisoners (n=104)*

Variable	Number (%)
Age(years)	
Mean ± SD	
37.04 (±10.05 SD)	
Marital status	
Single	92(88%)
Married	08(7.7%)
Divorced	04(4.3%)
Place of residence	
Urban Dweller	85(81.7%)
Village	19(18.3%)
Family incomes	
Rs. <10,000	24(23.1%)
Rs. 11,000-Rs. 20, 000	40(38.5%)
Rs. 21,000-Rs. 30, 000	16(15.4%)
≥Rs. 30,000	24(22.1%)
Status of imprisonment	
Accused	66(63.5%)
Convicted	38(36.5%)

Table 2 shows the statistical dynamics of the overall jail environment.

Table 2: *The Living Environment in Jail (n =104)*

Variable	Number (%)
Cleanliness of toilets and bathrooms	
Very bad	02(1.9%)
Bad	00(00%)
Moderate	34(32.7%)
Good	58(55.8%)
Very good	10(9.6%)
Quality of food	
Very bad	03(2.9%)
Bad	07(6.7%)
Moderate	49(47.1%)
Good	41(39.4%)
Very good	04(3.8%)
Accessibility to television	
Yes	94(90.4%)
No	10(9.6%)
Accessibility to phone	
Yes	48(46.2%)
No	56(53.8%)
Participation in Yoga/Recreational activities	
Yes	58(55.8%)
No	46(44.2%)
Physical activity	
Yes	52(50%)
No	52(50%)
Overall rating for jail environment	
Very bad	07(6.7%)
Bad	02(1.9%)
Moderate	55(52.9%)
Good	35(33.7%)
Very good	05(4.8%)
Access to religious practices	
Yes	103(99%)
No	01(1%)

Figure 1 shows the details of the Patient Health Questionnaire-9 scale. The dataset reveals that a considerable number of respondents (n=69, 66.3%) reported receiving family members' support. In contrast, 33.7% (n= 35) are devoid of support from their family. Moreover, the data indicates that 62.5% (n =65) of respondents received support from their friends within the jail, while 37.5% (n=39) report a lack of support from their peers. The data about the distri-

bution of depression severity among a sample population was assessed using the PHQ-9 total scores. Among the 104 individuals surveyed, 16.3% (n=17) exhibited minimal depression. A larger proportion, comprising 27.9% (n=29) of the sample, fell into the category of mild depression. Similarly, 21.2% (n=22) of the sample experienced moderate depression. Nearly an equivalent percentage, 27.9%(n=29), displayed symptoms of moderately severe depression. Finally, a smaller subset, constituting 6.7% (n=7) of the sample demonstrated severe depression. The binary logistic regression analysis examined various determinants of depression among 104 prisoners as shown in Table 3. All variables were entered into model based on clinical and literature relevance. Findings revealed that while age (OR = 1.042, 95% CI: 0.987-1.100, p = 0.137) and family income (OR = 1.093, 95% CI: 0.972-1.216, p = 0.662) did not significantly predict depression, education level emerged as a significant factor (OR=1.167, 95% CI: 1.015-1.342, p=0.030), indicating that higher levels of education were associated with increased odds of depression among prisoners. Notably, imprisonment status showed a significant association, with convicted prisoners having significantly lower odds of depression compared to accused prisoners (OR = 0.205, 95% CI: 0.062-0.678, p = 0.009). Social support also played a crucial role, with low (OR = 4.221, 95% CI: 1.023-18.057, p = 0.048) and moderate (OR = 3.219, 95% CI: 1.046-9.902, p=0.041) levels of social support significantly increasing the odds of depression compared to high social support. While there was a trend suggesting that perceiving the jail environment as bad may increase the odds of depression (OR = 2.747, 95% CI: 0.844-8.943, p=0.093), this was not statistically significant. Similarly, perceiving the environment as moderate did not significantly differ in odds of depression compared to perceiving it as good (OR = 1.175, 95% CI: 0.296-4.665, p = 0.818). In summary, higher education levels and lower social support significantly increase the odds of depression among female prisoners. Being a convicted prisoner significantly decreases the odds of depression among them. Perceiving the jail environment as bad, age and low family income were found to be the factors aggravating depression, but the results are not statistically significant. Other factors such as marital status, number of children, and religion did not significantly predict levels of depression among prisoners.

Table 3: *Binary Logistic Regression Analysis of Factors Associated with Depression (N= 104)*

Variable	Adjusted OR	95% CI	p-value
Age	1.042	0.987 – 1.100	0.137
Family income	1.093	0.972 – 1.216	0.662
Education level	1.167	1.015 – 1.342	0.030
Imprisonment status (convicted vs accused)	0.205	0.062 – 0.678	0.009
Social support (moderate vs high)	3.219	1.046 – 9.902	0.041
Social support (low vs high)	4.221	1.023 – 18.057	0.048
Jail environment (bad vs good)	2.747	0.844 – 8.943	0.093
Jail environment (moderate vs good)	1.175	0.296 – 4.665	0.818

Discussion

This study identifies a substantial burden of depressive symptoms among female prisoners, with severity varying across participants. This cross-sectional study of 104 female prisoners at Kot Lakhpat Jail, Lahore, identified a burden of depressive symptoms and highlighted education, imprisonment status, and social support as significant correlates. On PHQ-9 assessment, 27.9% had mild, 21.2% moderate, 27.9% moderately severe, and 6.7% severe depression, while 16.3% had minimal symptoms. A cross-sectional study of 105 male prisoners in Odisha, India, similarly reported 25.7% moderately severe and 27.6% severe depression.[3] A one-year prospective study of 144 newly employed US correctional officers also demonstrated increasing depressive symptoms and burnout, illustrating psychological strain within correctional settings.[11]

Higher education significantly increased the odds of depression (OR=1.167, 95% CI:1.015–1.342; p=0.030), while convicted prisoners had lower odds than accused prisoners (OR=0.205, 95% CI:0.062–0.678; p=0.009). These findings are supported by the Odisha study, which similarly identified higher education and accused status as predictors.[3] In contrast, among 408 predominantly male prisoners in Mekelle, Ethiopia, education was not retained as a significant correlate; instead, substance use, child abuse, sentence duration, and prison-related conditions were associated with depression, suggesting contextual variation.[6] Social support showed the strongest association: low support increased the odds more than fourfold (OR=4.221; p=0.048), and mode-rate support approximately threefold (OR=3.219; p=0.041), comp-

ared with high support. This aligns with the Mekelle findings and a study of 649 Ethiopian prisoners, where 64.7% reported good perceived social support, comparable with 66.3% family support in our sample. Peer-support approaches are also incorporated into US correctional suicide-prevention policies.[6,12,13] Although a bad jail environment increased the odds of depression, the association was not statistically significant (OR=2.747; p=0.093). Nevertheless, a cross-sectional study of 300 Nigerian male inmates documented nighttime noise (41.4%), poor sleep (47.3%), and poor family support (27%) , supporting attention to environmental conditions.[14]

A study conducted at French jail setting revealed that compared to general population, incarcerated individuals show significantly higher prevalence of alcohol and drug use disorders with strong adjusted association between incarceration, trauma exposure, and substance abuse.[15] Synthetic cannabinoid use was documented among 122 UK male prisoners, while a Karachi study of 600 male prisoners reported substantial substance use.[16,17] Future studies should incorporate trauma and substance-use variables. A systematic review of six prison-based intervention studies reported promising effects of CBT and tailored behavioral programmes, although methodological limitations remained, supporting psychological services for incarcerated women.[18] The cross-sectional design, single jail setting and quantitative nature of study are limitations for causal inference and generalizability of findings. Larger multicenter studies incorporating trauma, substance use and other psychological factors are recommended along with qualitative inquiry for in-depth exploration.

Conclusion

The study reveals higher education levels and low to moderate social support as significant determinants of depression requiring targeted interventions. These interventions include vocational training, advanced teaching programs, teaching and learning opportunities, peer support groups, library access, skill development and recreational activities. Cognitive behavioral therapy services are required for ongoing support for female prisoners. Access to mental health services like mindfulness-based stress reduction (MBSR) and medicinal interventions where required, will ensure decrease in depression.

Ethical Approval: The Institutional Review Board of Rashid Latif Medical College, Lahore approved this study vide Ref No. IRB/2023/086. Written permission was also obtained from the jail authorities prior to data collection. The study was conducted at Kot Lakhpat Jail, Lahore, Pakistan, in accordance with ethical principles of research involving human participants.

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Authors' Contribution:

AM: Conception and design; acquisition of data; drafting of article; analysis and interpretation of data; final approval of the version to be published.

NK: Analysis and interpretation of data; critical revisions for important intellectual content.

SY: Conception and design; critical revisions for important intellectual content; final approval of the version to be published.

UH: Critical revisions for important intellectual content; final approval of the version to be published

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