

Understanding Mental Health Disorder Burden: Gender-Wise Analysis

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Abstract

Mental health disorders significantly impact global public health, and Himachal Pradesh disproportionately impose burdens. Limited infrastructure constrains effective responses. This study aimed to examine the gender related burden of mental health disorders in Himachal Pradesh, with a focus on identifying patterns of prevalence and differences across disorder categories and severity levels. Statistical analysis revealed significant gender-based disparities in overall mental health disorder burden. The Mann–Whitney U test indicated higher mean ranks among males for miscellaneous and other mental health disorders ($Z = 9.566$, $p < 0.001$) and for overall disorders ($Z = 3.966$, $p < 0.001$). However, no significant gender differences were observed across most specific categories, including mood, anxiety, substance-use, and psychotic disorders. Chi-square analysis demonstrated a significant association between gender and disorder severity ($\chi^2 = 19.091$, $p < 0.001$), with males being more represented in moderate-and high-level disorders, while females were more represented in low-level disorders. A further association was observed for miscellaneous and other disorders, where males accounted for 60.8% of the cases ($\chi^2 = 141.233$, $p = 0.001$). The findings suggest that while many mental health disorders manifest comparably across genders, significant disparities exist in unclassified or less common categories, as well as in overall disorder severity. These patterns highlight sociocultural and systemic dynamics influencing diagnosis, reporting, and treatment-seeking behaviors. This study highlights the importance of adopting a gender-sensitive approach in mental health research, policy, and service delivery to strengthen equitable and effective care in Himachal Pradesh and similar contexts....

Keywords Mental health disorders, Gender disparities, Burden of disease, Disorder severity.

INTRODUCTION

Mental health disorders have emerged as a critical global public health concern, contributing substantially to health, social, and economic burdens (World Health Organization, 2021). The prevalence and impact of these disorders have steadily increased over the past several decades, with low- and middle-income countries being disproportionately affected (Knipe et al., 2022). In South Asia, including India and Himachal Pradesh, demographic and lifestyle transitions have been strongly associated with an increase in mental and substance-use disorders. However, existing health systems remain underprepared to address these needs, leaving most individuals without adequate care (WHO, 2016b; Gautham et al., 2020). Against this backdrop, examining the burden of mental health disorders through a gender-wise lens is essential for identifying disparities and informing policy.

The WHO's vision of "health for all" emphasizes universal access to essential health services (WHO, 2019). Health equity is achieved when individuals attain optimal health without disadvantages stemming from socioeconomic or structural inequalities (Braveman & Gruskin, 2003; Whitehead, 1991). However, disparities in illness and wellbeing persist globally (Marmot, 2007). Gender equality, recognized by the WHO as both a determinant of health and a development goal, is central to achieving Sustainable Development Goals (SDGs) 3 and 5. Advancing gender equity thus not only improves health outcomes but also strengthens broader sustainable development priorities (WHO, 2018; United Nations, 2015).

1.1 The Burden of Mental Health Disorders

As a country with entrenched gender inequality, India has disparities in health expenditure, underscoring the interdependent nature of gender and health (Sen et al., 2007; Mahal et al., 2010; WHO, 2018). Mental health represents a vital dimension of human well-being, extending beyond the absence of illness and encompassing both individual and collective health (WHO, 2001; WHO, 2022). Globally, more than one billion people are affected by mental illness or substance-use disorders, posing a persistent challenge to achieving optimal health outcomes (WHO, 2022). Mental disorders are leading contributors to disability and premature mortality, and their burden continues to increase across sociodemographic contexts (GBD 2019 Mental Disorders Collaborators, 2022). Between 1990 and 2019, mental disorders ranked as the seventh leading cause of disability-adjusted life years (DALYs) and the second leading cause of years lived with disability (YLDs), creating substantial challenges for health systems worldwide

(Ahmed et al., 2022)., including those in India and Himachal Pradesh.

1.2 The Burden of Mental Health Disorders in India and Himachal Pradesh

In India, mental illness has been identified as a major contributor to the non-fatal disease burden (Sagar et al., 2020). A considerable segment of the population is affected by mental health conditions ranging from mild to severe. Notably, between 1990 and 2017, the proportion of mental illnesses within India's overall disease burden nearly doubled, highlighting their growing significance within the national public health landscape (Sagar et al., 2020).

In Himachal Pradesh, mental health infrastructure remains limited, although gradual expansion is evident. At the state level, one dedicated mental hospital with a capacity of 62 beds functions as the primary facility. Tertiary care psychiatric services are available at Indira Gandhi Medical College (IGMC), Shimla, which has a 30 bed psychiatric ward, and Dr. Rajendra Prasad Government Medical College and Hospital (RPGMCH), Tanda, which has a 10-bedded ward. Four recently established medical colleges also operate psychiatry departments providing psychiatric and de-addiction services. At the district level, General Hospital Psychiatry Units (GHPUs) are staffed with psychiatrists delivering psychiatric and de-addiction care. The District Mental Health Programme (DMHP) is active across all districts; however, shortages of trained professionals constrain its role in identifying cases and referring patients to higher centers (Government of Himachal Pradesh, 2023). At the sub-district level, psychiatric and de-addiction services are available at 16 community health centers (CHCs) and 5 civil hospitals.

Globally, the WHO's World Health Report 2001 highlighted the widespread prevalence and burden of mental disorders, estimating that approximately 20% of patients in primary health care settings suffer from one or more mental conditions, while one in four families is likely to have a member affected by a behavioral or mental disorder (WHO, 2001). Mental disorders accounted for 10.5% of the global disease burden in 1990, increasing to 12% in 2000, with projections of 15% by 2020. More recent evidence indicates that the overall burden of mental disorders continues to increase, with significant disparities across gender, geographic regions, and disorder subtypes (Fan et al., 2025).

These trends highlight the urgent need for comprehensive and integrated approaches to strengthen mental health systems at both the national and subnational levels. Against this backdrop, the present study seeks to examine the gender-wise burden of mental health disorders and assess the underlying disparities in Himachal Pradesh, thereby contributing evidence to informing policy and promoting equitable mental health strategies.

1.3 Methods

This study adopted a cross-sectional, quantitative design, complemented by interpretive qualitative insights to contextualize gender disparities in individuals with mental health disorders in Himachal Pradesh, India. This research focused specifically on the rural population of Shimla district. The data were obtained from the Hospital-Based Mental Health Disorder Registry maintained at Indira Gandhi Medical College (IGMC), Shimla, for the years 2014, 2022, and 2023.

The inclusion criterion was a confirmed diagnosis of mental health disorders among rural residents of Shimla district. Urban residents and nonresidents of Himachal Pradesh were excluded to maintain contextual specificity. The demographic variables included age, categorized as younger than 11 years and 70 years and older. The quantitative dataset consisted of 14,862 patients, with 7,534 males and 7,328 females.

Descriptive statistics were used to summarize the prevalence of mental health disorders by gender. Inferential analyses included the Mann–Whitney U test to assess gender differences in mean ranks across disorder categories

and chi-square tests of association to examine relationships between gender and disorder severity levels. $P < 0.05$ indicated statistical significance, and highly significant associations were identified at $p < 0.01$.

1.4 Results

1.4.1 Gender Differences in the Mean Ranks of Mental Health Disorders

The Mann–Whitney U test was applied to assess whether significant differences existed between males and females in the mean ranks of various categories of mental health disorders (Table 1). Significant differences emerged for miscellaneous and other mental health disorders ($Z = 9.566$, $p < 0.001$), with males exhibiting higher mean ranks than females. Similarly, the overall measure of mental health disorders indicated a significant gender disparity ($Z = 3.966$, $p < 0.001$). In contrast, no statistically significant gender-based differences were found for schizophrenia and psychotic disorders ($Z = 1.11$, $p = 0.267$), neurodevelopmental disorders ($Z = 0.269$, $p = 0.788$), somatic symptoms and related disorders ($Z = 0.063$, $p = 0.950$), substance-related disorders ($Z = 0.463$, $p = 0.643$), mood disorders ($Z = 0.007$, $p = 0.994$), anxiety and stress disorders ($Z = 1.05$, $p = 0.294$), personality disorders ($Z = 1.058$, $p = 0.290$), developmental and behavioral disorders ($Z = 0.742$, $p = 0.458$), or cognitive disorders ($Z = 1.633$, $p = 0.102$). There was a marginal trend in the number of sleep disorders ($Z = 1.672$, $p = 0.095$) but this difference did not reach statistical significance.

Table 1. Mann–Whitney U test results for gender differences in the mean ranks of mental health disorders

Disorder	Male	Female	Z Value	P value
Schizophrenia and Psychotic Disorders	195.9	188.6	1.11	0.267
Neurodevelopmental Disorders	29.12	30.36	0.269	0.788
Somatic Symptom and Related Disorders	177.87	177.22	0.063	0.95
Substance-Related Disorders	1074.3	1062.19	0.463	0.643
Sleep Disorders	50.34	42.13	1.672	0.095
Miscellaneous & Other Mental Health Disorders	362.23	226.51	9.566	<.001**
Mood Disorders	816.08	815.92	0.007	0.994
Anxiety and Stress Disorders	177.6	166.93	1.05	0.294
Personality Disorders	6	3.67	1.058	0.29
Developmental and Behavioural Disorders	27.03	23.94	0.742	0.458
Cognitive Disorders	12.83	11	1.633	0.102
Overall Disorders	2864.6	2697.11	3.966	<.001**

Note: ** denotes significance at the 1% level

1.4.2 Association between Gender and Levels of Mental Disorders

A chi-square test for associations was also conducted to examine the relationship between gender and disorder severity (Table 2). The results revealed a statistically significant association ($\chi^2 = 19.091$, $p < 0.001$). Moderate-level disorders were the most prevalent disorders among both males (44.9%) and females (41.7%). High-level disorders were slightly more common in males (28.1%) than in females (26.3%), whereas low-level disorders were more prevalent in females (32.0%) than in males (27.1%). The distribution patterns further indicated that males accounted for a greater proportion of moderate (53.7%) and high (53.4%) cases, while females accounted for more low-level cases (52.2%).

Table 2: Gender-wise Distribution of Mental Disorder Levels

Gender	Low	Moderate	High	Total	Chi-Square / P Value
Male	781 (27.1) [47.7]	1294 (44.9) [53.7]	810 (28.1) [53.4]	2885 (100.0) [51.8]	19.091 / < .001**
Female	856 (32.0) [52.2]	1117 (41.7) [46.3]	705 (26.3) [46.5]	2678 (100.0) [48.1]	
No Response	2(50) [0.1]	0 (0.0) [0.0]	2 (50.0) [0.1]	4 (100.0) [0.1]	
Total	1639 (29.4) [100.0]	2411 (43.3) [100.0]	1517 (27.2) [100.0]	5567 (100.0) [100.0]	

Note: 1. The value within () refers to the row percentage

2. The value within [] refers to the column percentage

3. ** Denotes significance at the 1% level

1.4.3 Association between Gender and Miscellaneous Mental Health Disorders

Further analysis using a chi-square test (Table 3) demonstrated a strong association between gender and the incidence of miscellaneous and other mental health disorders ($\chi^2 = 141.233$, $p = 0.001$). There was a significantly greater proportion of male patients (60.8%) than female patients (39.2%). These findings suggest that men may be more susceptible to unclassified or less common mental health disorders. Possible explanations include sociocultural influences, variations in healthcare-seeking behaviors, exposure to differential stressors, or biological factors. The comparatively lower proportion of females may also reflect underreporting or differences in symptom manifestation.

Overall, the results indicate that gender differences are not pronounced across most specific categories of mental health disorders. However, significant disparities emerged in miscellaneous and other disorders as well as in the overall burden of mental health disorders, where males exhibited consistently greater representation. These findings highlight that while many disorders show comparable prevalence across genders, certain categories reflect underlying gendered dynamics that warrant further exploration.

Table 3. Chi-square test of the association between gender and miscellaneous and other mental health disorders.

Gender	Miscellaneous and Other Mental Disorders	Chi-Square / P Value
Male	375 (100.0) [60.8]	141.233 / 0.001**
Female	242 (100.0) [39.2]	
Total	617 (100.0) [100.0]	

Note: 1. The value within () refers to the row percentage

2. The value within [] refers to the column percentage

3. ** Denotes significance at the 1% level

1.5 Conclusion

The study highlights that while the prevalence of most specific categories of mental health disorders does not significantly differ between males and females, notable gender disparities exist in the overall burden and in the category of miscellaneous and other mental health disorders. There was greater representation of males in these domains, and greater prevalence of moderate-and high-severity cases, whereas females were more commonly associated with low-level disorders. These patterns point toward complex gendered dynamics shaped by sociocultural influences, healthcare-seeking behaviors, stress exposure, and possibly biological factors. The findings further

suggest that unclassified or less common mental health disorders may disproportionately affect men, highlighting the need for targeted investigation into their etiology and manifestation.

Importantly, the results emphasize the necessity of adopting a gender-sensitive lens in mental health research and policy. Addressing disparities in diagnosis, reporting, and treatment access is essential for strengthening equitable mental health systems. For Himachal Pradesh, and similar socio-demographic contexts, these insights provide a foundation for tailoring interventions that not only expand access to care but also respond to the nuanced ways gender shapes the burden of mental health disorders.

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Clinical trial number

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Conflicts of Interest

The authors declare no conflicts of interest.

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