DOI: https://doi.org/10.54393/pbmj.v9i10.1416

PAKISTAN BIOMEDICAL JOURNAL
https://www.pakistanbmj.com/journal/index.php/pbmj/index
ISSN (E): 2709-2798, (P): 2709-278X
Volume 9, Issue 10 (October 2026)

Original Article

Mental Health Burden among Adults with Chronic Communicable and Non-Communicable Diseases at a Tertiary Care Hospital in Pakistan

Muhammad Muslim Khan[1], Shah Zeb[2*], Muhammad Noman Said[3] and Muhammad Ozair Mansoor[2]

[1]Department of Psychiatry, Mardan Medical Complex, Bacha Khan Medical College, Mardan, Pakistan
[2]Department of Medicine, Mardan Medical Complex, Mardan, Pakistan
[3]Department of Medicine, District Headquarters Hospital, Mardan, Pakistan

ARTICLE INFO

Keywords:
Depression, Anxiety, Chronic Disease, Communicable Diseases

How to Cite:
Khan, M. M., Zeb, S., Said, M. N., & Mansoor, M. O. (2026). Mental Health Burden among Adults with Chronic Communicable and Non-Communicable Diseases at a Tertiary Care Hospital in Pakistan: Mental Health among Adults with Chronic Communicable and Non-Communicable Diseases. Pakistan BioMedical Journal, 9(10), 17-24. https://doi.org/10.54393/pbmj.v9i10.1416

***Corresponding Author:**
Shah Zeb
Department of Medicine, Mardan Medical Complex, Mardan, Pakistan
dr.shahzeb1982@gmail.com

Received Date: 19th August, 2026
1st Revision Received: 3rd October, 2026
2nd Revision Received: 16th October, 2026
Acceptance Date: 23rd October, 2026
Published Date: 31st October, 2026

ABSTRACT

Depressive and anxiety symptoms are prevalent but can be undetected in adults with chronic physical conditions. **Objective:** To determine the burden of depression and anxiety symptoms among adults with chronic communicable and non-communicable diseases. **Methods:** An analytical cross-sectional study was conducted at the Medical Teaching Institute, Mardan Medical Complex, and included 476 adults, with 238 patients in each disease group. The data which is related to the sociodemographic and clinical data was collected by using a structured questionnaire. The PHQ-9 and the GAD-7 were used to assess the symptoms of depression and anxiety. Chi-square and Fisher's exact test and independent-samples t/Mann-Whitney U test were used for group comparisons. **Results:** Depression symptoms above the predefined PHQ-9 threshold were present in 42.4% and were more frequent in non-communicable diseases (47.5% vs. 37.4%, p=0.029). Anxiety symptoms above the predefined GAD-7 threshold occurred in 32.6%, without significant group difference (36.6% vs. 28.6%, p=0.071). Depression was independently associated with non-communicable disease (OR 1.48, 95% CI 1.01-2.17), female sex (OR 1.76, 95% CI 1.20-2.59), lower socioeconomic status (OR 1.91, 95% CI 1.25-2.92), disease duration ≥5 years (OR 1.57, 95% CI 1.07-2.31), multimorbidity (OR 2.08, 95% CI 1.38-3.14), and recent hospitalization (OR 1.64, 95% CI 1.06-2.53). Anxiety was associated with female sex (OR 2.01, 95% CI 1.36-2.98), lower socioeconomic status (OR 1.67, 95% CI 1.08-2.59), and multimorbidity (OR 1.78, 95% CI 1.17-2.71). **Conclusion:** Depression and anxiety symptoms were common, particularly among patients with multimorbidity, lower socioeconomic status, and female sex.

INTRODUCTION

Mental health is an important component of chronic disease care, yet depression and anxiety symptoms may be overlooked when patients seek care primarily for physical illness. Research involving South Asian adults with chronic conditions has described substantial psychological distress and variation according to illness type and social circumstances [1]. Depression may affect self-care, rehabilitation adherence, and quality of life, while chronic disease and psychological distress can interact through functional limitations and difficulties with disease management [2, 3]. In a Pakistani community survey, adults with cardiometabolic disease had higher odds of mild or moderate depression than those without cardiometabolic disease; a separate hospital-based comparison found depression in 37.25% of participants with non-communicable conditions versus 24.75% with communicable conditions. These figures arise from different study populations and screening tools and should not be treated as directly comparable pooled estimates [4, 5]. Pakistan faces a substantial burden of non-communicable diseases alongside persistent infectious diseases. The WHO Noncommunicable Diseases Progress

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

DOI: https://doi.org/10.54393/pbmj.v9i10.1416

Monitor 2025 documents the national policy and health-system response to non-communicable diseases, while the WHO Global Tuberculosis Report 2025 identifies Pakistan among countries accounting for a large share of incident tuberculosis worldwide [6, 7]. Cardiovascular diseases are major contributors to global mortality and include coronary and cerebrovascular conditions [8]. Chronic infections such as tuberculosis, hepatitis B/C, and HIV can present prolonged care needs and psychological burdens. Mental health services remain an important area of health-system development in Pakistan [9]. A 2025 survey also documented symptoms of psychological distress among Pakistani adults, although its community estimates are not directly generalizable to a hospital-based chronic-disease population [10]. Chronic physical disease may coexist with mental illness, and this combination could be especially strong in individuals with more than one chronic disease or those with a long history of illness. Medication burden, costs of health care, and functional limitations and reliance on family members may be greater with multimorbidity, compounding psychological distress. Studies conducted in Pakistan have demonstrated that people with multimorbidity are at increased risk of depression and anxiety, especially among the less privileged [11]. Although research has examined mental health in individual chronic conditions and some studies have compared communicable and non-communicable disease categories, evidence from tertiary-care populations in Khyber Pakhtunkhwa remains useful for local screening and service planning. A hospital-based comparison using the PHQ-9 and GAD-7, together with disease duration, multimorbidity, and sociodemographic characteristics, may help identify groups requiring psychological assessment.

The burden of mental health problems among people affected by individual chronic diseases has been studied in various international and Pakistani studies; however, there is no comprehensive and comparative evidence from the tertiary care setup in Khyber Pakhtunkhwa on both depression and anxiety symptoms across the wide range of chronic communicable and non-communicable diseases among the study population. Moreover, little literature is available to examine the interaction between sociodemographic (such as socioeconomic status, gender) and clinical (such as multimorbidity, length of disease, recent hospitalizations) factors that impact mental health outcomes for these specific patient groups in this region. This study therefore aimed to determine the burden of depression and anxiety symptoms among adults with chronic communicable and non-communicable diseases.

METHODS

An analytical cross-sectional study was carried out at the Medical Teaching Institute, Mardan Medical Complex, Mardan. The study took place for three years from 1 February 2023 to 31 January 2026. The study was started after ethical approval from the institutional ethical review committee was obtained approval no. 467/BKMC dated 6 January 2023. A sample size was determined based on OpenEpi version 3.01, based on a recent study conducted by Abbas et al. which included 400 patients with chronic communicable diseases and 400 patients with non-communicable diseases, with depression reported in 24.75% of chronic communicable disease patients and 37.25% of non-communicable disease patients [5]. With a two-sided 95% confidence level, 80% power, a 1:1 allocation ratio, and assumed depression rates of 24.75% and 37.25%, respectively, a sample size of 476 participants (238 per group) was calculated. A non-probability consecutive sampling technique was used. Participants who were ≥18 years of age, with a clinically documented chronic communicable or non-communicable disease diagnosis of at least three months' duration, receiving treatment or follow-up at the study hospital, understood the study questions, provided informed consent, and were willing to participate were included. Participants who had a previously diagnosed severe psychiatric disorder, significant cognitive impairment or altered consciousness that made it difficult to complete the questionnaire, had an acute medical emergency requiring immediate medical attention, had an acute infectious illness with no known chronic disease diagnosis, did not have clinical records or questionnaires that allowed for all the primary study outcomes to be assessed, or failed to provide informed consent were excluded. Following ethical approval, eligible patients were approached in the appropriate outpatient clinics, wards, and chronic disease units. Each participant was told the purpose of the study, the procedures, the possible benefits, and the confidentiality of the study, and written informed consent was obtained before enrollment. Information was obtained using a structured questionnaire for data collection, which included age, gender, marital status, highest educational attainment, occupation, place of residence, socioeconomic status, and other sociodemographic characteristics. Depressive symptoms were assessed with the Patient Health Questionnaire-9 (PHQ-9) and anxiety symptoms with the Generalized Anxiety Disorder-7(GAD-7). PHQ-9 severity categories were 0–4 (minimal), 5–9 (mild), 10–14 (moderate), 15–19 (moderately severe), and 20–27 (severe). GAD-7 categories were 0–4 (minimal), 5–9 (mild), 10–14 (moderate), and 15–21 (severe); a score of ≥10 was stated as the threshold for clinically relevant anxiety. Recent Pakistani studies have

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

DOI: https://doi.org/10.54393/pbmj.v9i10.1416

investigated PHQ-9 psychometric performance and the validity of Urdu-language GAD-7 screening, and the instruments have been used for mental health assessment in Pakistani settings [12-14]. Questionnaires were administered in a private setting by a trained researcher. For participants with limited literacy, questions were read aloud without altering the participant's responses. Chronic disease diagnoses were identified from existing clinical records rather than independently reassessed for this study. Tuberculosis diagnoses were abstracted from recorded clinical and laboratory information, with WHO guidance on TB diagnosis used as the disease-specific reference [15]. For anti-tuberculosis regimens documented as having distinct phases, treatment phase was recorded as intensive or continuation according to the prescribed regimen [16]. For participants with HIV, the most recent available viral load was abstracted; viral suppression was defined as fewer than 1,000 copies/mL in accordance with WHO guidance [17]. For cancer, documented diagnosis and stage were obtained from clinical records, with TNM stage or stage group (I–IV) recorded when available. Cardiovascular disease included clinician-documented ischemic heart disease, heart failure, cerebrovascular disease, and other documented cardiovascular disorders; hypertension was also recorded separately as a chronic condition. The grouping of cardiac and cerebrovascular disorders was informed by WHO's cardiovascular disease classification [8]. Multimorbidity was defined operationally as the coexistence of two or more chronic health conditions in one individual [18].

Data were entered, cleaned, and analyzed using IBM SPSS Statistics version 26.0. Continuous variables were tested for normality and presented as the mean ± SD for normally distributed continuous variables, and as the median (IQR) for non-normally distributed continuous variables. Categorical variables were displayed as frequencies and percentages. Prevalence of depression and anxiety was computed independently for the groups with chronic communicable and chronic non-communicable diseases. Chi-square test or Fisher's exact test was used to compare the two groups for categorical variables. Normally distributed continuous variables were analyzed with an independent-samples t-test, while non-normally distributed continuous variables were analyzed with a Mann-Whitney U test. In multivariable logistic regression, variables with p-value<0.20 in univariable analysis and those that were clinically relevant and were already known to have clinical significance were chosen as candidate associated factors. Depression and anxiety were modeled separately. Clinically meaningful reference categories were a priori defined for categorical variables as follows: communicable disease for disease category, male sex for sex, age <60 years for age, upper socioeconomic status for socioeconomic status, disease duration <5 years for disease duration, no multimorbidity for multimorbidity, no recent hospitalization for hospitalization, and treatment duration <5 years for treatment duration. The odds ratios (ORs) were reported with 95% confidence intervals (CIs). Variance inflation factor (VIF) and tolerance statistics were used to evaluate multicollinearity of the predictors and interpret the multivariable logistic regression models. Potential multicollinearity was indicated by VIF >5 and tolerance <0.20. Particular attention was given to the correlations among disease duration and treatment duration and among disease category, number of chronic conditions, and multimorbidity. The participant flow diagram is shown (Figure 1).

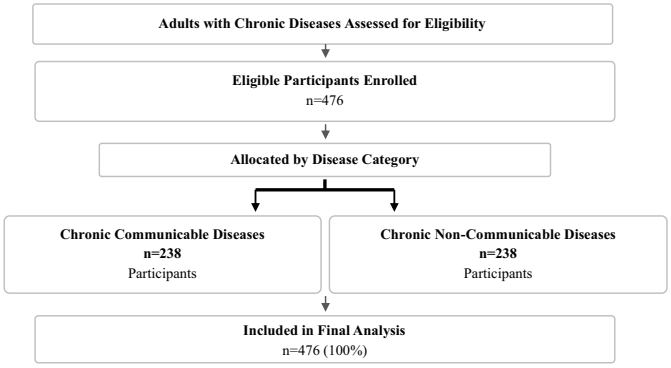

Figure 1: Participant Flow Diagram Showing Enrollment, Disease-Category Grouping, and Final Analysis

RESULTS

Among the 476 participants, significant differences between the communicable and non-communicable disease groups were observed in age, disease duration, treatment duration, number of chronic conditions, and multimorbidity. Participants who had non-communicable diseases tended to be older and had significantly longer histories of disease and treatment; multimorbidity was more prevalent in these participants (Table 1).

Table 1: Sociodemographic and Clinical Characteristics of Participants and Depression and Anxiety According to Disease Category (n=476)

Variables	Category/Statistic	Communicable Diseases (n=238), n (%)	Non-communicable Diseases (n=238), n (%)	p-value
Age (years)	Mean ± SD	43.8 ± 13.2	55.6 ± 12.1	<0.001*
Age group	18-39 Years	83 (34.9%)	32 (13.4%)	<0.001†
	40-59 Years	101 (42.4%)	103 (43.3%)	
	≥60 Years	54 (22.7%)	103 (43.3%)	

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

DOI: https://doi.org/10.54393/pbmj.v9i10.1416

Sex	Male	136 (57.1%)	124 (52.1%)	0.276†
	Female	102 (42.9%)	114 (47.9%)	
Marital status	Married	176 (73.9%)	188 (79.0%)	0.186†
	Unmarried/Widowed/Divorced	62 (26.1%)	50 (21.0%)	
Education	No Formal Education	48 (20.2%)	61 (25.6%)	0.091†
	Primary/Secondary	126 (52.9%)	119 (50.0%)	
	Higher Education	64 (26.9%)	58 (24.4%)	
Occupation	Employed	83 (34.9%)	74 (31.1%)	0.372†
	Unemployed/Household	108 (45.4%)	119 (50.0%)	
	Retired	47 (19.7%)	45 (18.9%)	
Residence	Urban	142 (59.7%)	151 (63.4%)	0.408†
	Rural	96 (40.3%)	87 (36.6%)	
Socioeconomic Status	Lower	102 (42.9%)	91 (38.2%)	0.409†
	Middle	107 (45.0%)	111 (46.6%)	
	Upper	29 (12.2%)	36 (15.1%)	
Disease Duration (years)	Median (IQR)	3.0 (1.5-6.0)	6.0 (3.0-10.0)	<0.001‡
Treatment Duration (years)	Median (IQR)	2.5 (1.0-5.0)	5.0 (2.0-9.0)	<0.001‡
Number of Chronic Conditions	Mean ± SD	1.3 ± 0.6	2.1 ± 0.9	<0.001*
Multimorbidity	Yes	41 (17.2%)	116 (48.7%)	<0.001†
	No	197 (82.8%)	122 (51.3%)	
Recent Hospitalization	Yes	58 (24.4%)	76 (31.9%)	0.071†
	No	180 (75.6%)	162 (68.1%)	
Treatment Status	Active Treatment	182 (76.5%)	171 (71.8%)	0.252†
	Follow-up Only	56 (23.5%)	67 (28.2%)	
Mental-Health Outcome				
Depression (PHQ-9)	None/Minimal	149 (62.6%)	125 (52.5%)	0.029†
	Mild	43 (18.1%)	50 (21.0%)	
	Moderate	32 (13.4%)	38 (16.0%)	
	Moderately Severe	11 (4.6%)	17 (7.1%)	
	Severe	3 (1.3%)	8 (3.4%)	
Clinically Relevant Depression	Yes	89 (37.4%)	113 (47.5%)	0.029†
	No	149 (62.6%)	125 (52.5%)	
Anxiety (GAD-7)	Minimal	170 (71.4%)	151 (63.4%)	0.071†
	Mild	38 (16.0%)	47 (19.7%)	
	Moderate	23 (9.7%)	29 (12.2%)	
	Severe	7 (2.9%)	11 (4.6%)	
Clinically Relevant Anxiety	Yes	68 (28.6%)	87 (36.6%)	0.071†
	No	170 (71.4%)	151 (63.4%)	

The most common communicable diseases were tuberculosis and hepatitis B/C, while the most common non-communicable diseases were diabetes mellitus and cardiovascular disease. Smaller but clinically relevant groups of the study population were related to cancer, HIV/AIDS, chronic respiratory disease, and chronic kidney disease (Table 2).

Table 2: Distribution of Chronic Diseases among Participants (n=476)

Disease Category	Specific Disease	n (%)
Communicable Diseases (n=238)	Tuberculosis	78 (32.8%)
	Hepatitis B/C	73 (30.7%)
	HIV/AIDS	42 (17.6%)
	Chronic Viral/Infectious Disease Other Than Above	45 (18.9%)
Non-communicable Diseases (n=238)	Diabetes Mellitus	71 (29.8%)
	Cardiovascular Disease	63 (26.5%)
	Cancer	43 (18.1%)
	Chronic Respiratory Disease	32 (13.4%)
	Chronic Kidney Disease	29 (12.2%)

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

DOI: https://doi.org/10.54393/pbmj.v9i10.1416

Several sociodemographic and clinical features were significantly related to depression. Depressed participants tended to be older, female, socioeconomically disadvantaged, to have a longer disease duration, multimorbidity, a recent hospitalization, and a longer treatment history. The results showed that both social vulnerability and higher chronic disease burden were associated with depression. The vulnerability pattern was similar for anxiety, with important associations found with female sex, low SES, multimorbidity, recent hospitalization, and prolonged treatment duration (Table 3).

Table 3: Association of Depression and Anxiety with Sociodemographic and Clinical Characteristics (n=476)

Variables	Category	Depression, n (%) (n=202)	No Depression, n (%) (n=274)	Anxiety, n (%) (n=155)	No Anxiety, n (%) (n=321)	p-value
Disease Category	Communicable	89 (44.1%)	149 (54.4%)	68 (43.9%)	170 (53.0%)	0.029† / 0.071†
	Non-communicable	113 (55.9%)	125 (45.6%)	87 (56.1%)	151 (47.0%)	
Gender	Male	94 (46.5%)	166 (60.6%)	63 (40.6%)	197 (61.4%)	0.003† / <0.001†
	Female	108 (53.5%)	108 (39.4%)	92 (59.4%)	124 (38.6%)	
Age	Mean ± SD	52.8 ± 13.1	47.4 ± 13.5	51.4 ± 13.2	48.9 ± 13.7	<0.001* / 0.066*
Socioeconomic Status	Lower	102 (50.5%)	91 (33.2%)	78 (50.3%)	115 (35.8%)	<0.001† / 0.006†
	Middle	82 (40.6%)	136 (49.6%)	61 (39.4%)	157 (48.9%)	
	Upper	18 (8.9%)	47 (17.2%)	16 (10.3%)	49 (15.3%)	
Disease Duration	≥5 Years	111 (55.0%)	113 (41.2%)	79 (51.0%)	145 (45.2%)	0.003† / 0.250†
	<5 Years	91 (45.0%)	161 (58.8%)	76 (49.0%)	176 (54.8%)	
Multimorbidity	Yes	89 (44.1%)	68 (24.8%)	67 (43.2%)	90 (28.0%)	<0.001† / 0.001†
	No	113 (55.9%)	206 (75.2%)	88 (56.8%)	231 (72.0%)	
Recent Hospitalization	Yes	72 (35.6%)	62 (22.6%)	55 (35.5%)	79 (24.6%)	0.002† / 0.014†
	No	130 (64.4%)	212 (77.4%)	100 (64.5%)	242 (75.4%)	
Treatment Duration	≥5 Years	92 (45.5%)	79 (28.8%)	70 (45.2%)	101 (31.5%)	<0.001† / 0.004†
	<5 Years	110 (54.5%)	195 (71.2%)	85 (54.8%)	220 (68.5%)	

*Independent-samples t-test. †Chi-square test. For each p-value pair, the first value corresponds to depression and the second to anxiety

In the multivariable analysis, non-communicable disease, being female, lower socioeconomic status, longer duration of the disease, multimorbidity, and recent hospitalization continued to be independently associated with depression. Multimorbidity was found to be the strongest associated factor of depression (Table 4).

Table 4: Multivariable Logistic Regression Analysis of Factors Associated with Depression and Anxiety among Participants (n=476)

Associated Factors	Depression Adjusted OR	95% CI	p-value	Anxiety-Adjusted OR	95% CI	p-value
Non-Communicable Disease vs Communicable Disease	1.48	1.01-2.17	0.044	1.39	0.93-2.07	0.106
Female Sex	1.76	1.20-2.59	0.004	2.01	1.36-2.98	<0.001
Age ≥60 Years	1.39	0.91-2.13	0.128	1.24	0.79-1.94	0.347
Lower Socioeconomic Status	1.91	1.25-2.92	0.003	1.67	1.08-2.59	0.021
Disease Duration ≥5 Years	1.57	1.07-2.31	0.021	1.29	0.87-1.92	0.204
Multimorbidity	2.08	1.38-3.14	<0.001	1.78	1.17-2.71	0.007
Recent Hospitalization	1.64	1.06-2.53	0.026	1.53	0.98-2.39	0.061
Treatment Duration ≥5 Years	1.43	0.96-2.13	0.079	1.46	0.96-2.22	0.076

DISCUSSION

The present study showed that there was a significant level of psychological morbidity among the adult population with chronic diseases, and that depression was more common than anxiety. The prevalence of clinically relevant depression was 42.4% of all participants, and clinically relevant anxiety was 32.6%. Importantly, the prevalence of depression was significantly higher in non-communicable disease patients than in communicable disease patients, but there was no significant difference in the prevalence of anxiety between the two groups. The greater depression burden in the non-communicable disease group is consistent with Pakistani research reporting substantial psychological symptoms among people with cardiovascular risk conditions. Yousuf *et al.* reported depression in 49.3% and anxiety in 55.2% of adults evaluated in a Karachi hospital study of hypertension and hypertensive crisis; their analyses did not show a significant association of these symptoms with hypertensive crisis itself [19]. In a similar study, Shahbaz *et al.* identified depression in 43.7% of their patients with diabetes, as well as strong links between female sex, older age, low income, diabetes duration, poor glycemic control, comorbidity, and treatment-related factors. These findings are similar to those observed in the present study,

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

DOI: https://doi.org/10.54393/pbmj.v9i10.1416

which found depression to be associated with female sex, socioeconomic disadvantage, duration of disease, and multimorbidity [20]. Fatima *et al.* assessed 1,573 patients with type 2 diabetes in Kohat, Khyber Pakhtunkhwa. More than half reported at least mild depressive symptoms on the PHQ-9; greater depression severity was associated with longer diabetes duration and older age. This disease-specific Pakistani evidence supports the relevance of chronic disease duration to psychological burden, although differences in screening definitions limit direct comparison of prevalence [21]. In a 2025 Karachi primary-care study, Iqbal *et al.* reported cardiometabolic multimorbidity in 47% of 496 participants and high frequencies of symptoms of anxiety, stress, and depression, particularly among women. Importantly, that study did not identify a statistically significant positive association between cardiometabolic multimorbidity and common mental-disorder symptoms. Thus, its high overall symptom burden is consistent with the need for psychological assessment, whereas its null multimorbidity association contrasts with the adjusted associations observed in the current study [22]. Patients with communicable diseases in the present study also had a substantial burden of psychological symptoms. Tuberculosis is particularly relevant because of treatment demands, stigma, and potential social and financial consequences. In a 2024 feasibility assessment across three TB facilities in Peshawar, approximately 35% of the 191 patients screened tested positive for depression, and stigma and cost were reported as barriers to integrating care [23]. In the same way, Jaffry *et al.* found that there was a lot of psychological stress among TB patients in Rawalpindi. Perceived stigma and poor social support were prevalent among participants, as were mild to moderate depression and moderate to moderately severe anxiety. The factors associated with depression were marital status, education, disease duration, and disease severity; and the factors associated with anxiety included treatment phase and illness duration [24]. A 2025 Pakistani study examined anxiety and social functioning among people living with HIV/AIDS, with attention to the impact of stigma and support needs [25].

There were several limitations in this study. First, because of its cross-sectional design, it was not possible to draw temporal or causal linkages between the characteristics of chronic disease and depression or anxiety. Hence, the observed relationships should be interpreted as correlational and not causal. Furthermore, significant baseline differences between the communicable and non-communicable disease groups in age, disease duration, treatment duration, number of chronic conditions, and multimorbidity may have confounded the crude comparison of depression prevalence. Therefore, the unadjusted findings should be interpreted cautiously, although multivariable logistic regression was performed to account for potential confounding factors. Longitudinally following respondents could help explain temporal relationships between the characteristics of chronic diseases and mental health symptoms. Further studies need to evaluate the effectiveness of targeted psychological and social interventions in improving mental health outcomes in high-risk patients.

CONCLUSIONS

Depression and anxiety were common among adults with chronic diseases. Multimorbidity and lower socioeconomic status were independently associated with both depression and anxiety, while female sex was independently associated with both outcomes. Non-communicable disease was independently associated with depression but not anxiety.

Authors' Contribution

Conceptualization: MMK
Methodology: MMK, MOM
Formal analysis: SZ, MNS
Writing and Drafting: MMK
Review and Editing: MMK, SZ, MNS, MOM

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflict of Interest

All the authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

REFERENCES

[1] Younas A, Zeb H, Arif I, Khan A, Ali A, Ali A *et al.* Sociocultural Determinants of Psychological Distress and Coping among South Asian Individuals with Chronic Illness. Discover Psychology. 2024 Apr; 4(1): 46. doi: 10.1007/s44202-024-00148-z.

[2] Wang J, Kuo WY, Chen MC, Chen CY. Impact of Rehabilitation Adherence and Depressive Symptoms on Post-Stroke Self-Care Ability and Quality of Life: A Longitudinal Study. Topics In Stroke Rehabilitation. 2024 May; 31(4): 361-71. doi: 10.1080/10749357.2023.2259652.

[3] Huang Y, Loux T, Huang X, Feng X. The Relationship Between Chronic Diseases and Mental Health: A Cross-Sectional Study. Mental Health and Prevention. 2023 Dec; 32: 200307. doi: 10.1016/j.mhp.2023.200307.

[4] Khan UI, Shah S, Qureshi A, Viswanathan S, Merchant AT, Virani SS *et al.* Burden of Cardiometabolic Diseases and Depression in a Low-Income, Urban Community in Pakistan: A Cross-Sectional Survey.

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

DOI: https://doi.org/10.54393/pbmj.v9i10.1416

BioMed Central Public Health. 2025 Feb; 25(1): 757. doi: 10.1186/s12889-025-21939-6.

[5] Abbas U, Hussain N, Tanveer M, Laghari RN, Ahmed I, Rajper AB. Frequency and Predictors of Depression and Anxiety in Chronic Illnesses: A Multi-Disease Study Across Non-Communicable and Communicable Diseases. PLOS One. 2025 May; 20(5): e0323126. doi: 10.1371/journal.pone.0323126.

[6] World Health Organization. Noncommunicable Diseases Progress Monitor 2025. World Health Organization. 2025 Jun. https://www.who.int/publications/i/item/9789240105775.

[7] World Health Organization. Global Tuberculosis Report 2025. Geneva: WHO. 2025. https://www.who.int/publications/i/item/9789240116924.

[8] World Health Organization. Cardiovascular Diseases (CVDs). 2025. https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds).

[9] Noorullah A, Asad N, Pirani S, Iqbal S, Khan MM. Mental Health Care in Pakistan. in Access to Mental Health Care in South Asia: Current Status, Potential Challenges, and Ways Out. Singapore: Springer Nature Singapore. 2024 Apr: 113-135. doi: 10.1007/978-981-99-9153-2_7.

[10] Malik M, Rehman H, Hussain A, Hashmi A, Al-Sunaidar KA, Balogh G *et al.* Psychological Burden and Coping Strategies among Pakistani Adults: A Cross-Sectional Survey Study. Epidemiologia. 2025 Jun; 6(3): 30. doi: 10.3390/epidemiologia6030030.

[11] Sharif H, Sheikh SS, Thompson AM, Hashmi M, Seemi T, Zaidi K *et al.* Prevalence of Mental Disorders among Patients with Multimorbidity Visiting Primary Care Settings in Slums of Karachi, Pakistan. Journal of Primary Care and Community Health. 2024 May; 15. doi: 10.1177/21501319241258658.

[12] Asghar T, Hassan A, Sahar I, Tahir M, Shahid B, Komal K. Psychometric Properties and Symptom Profiles of the PHQ-9 and DASS-21 among Medical and Non-Medical University Students: A Cross-Sectional Study in Pakistan. BioMed Central Psychology. 2026 Aug. doi: 10.1186/s40359-026-05332-5.

[13] Khan A, Madihie A, Ali I. Cross-Cultural Adaptation and Psychometric Validation of the Generalized Anxiety Disorder Assessment-7 For Urdu-Speaking Clinical Populations. Healthcare in Low Resource Settings. 2026 Apr; 14(2): 1. doi: 10.4081/hls.2026.14309.

[14] Aga IZ, Khurram SS, Karim M, Muzzamil M, Hashmi S, Shafique K. Employing Telepsychiatry Services to Assess the Prevalence and Identify Mental Health Disorders Using the PHQ-9 and GAD-7 in Resource-Constrained Regions of Dadar Mansehra, Pakistan: An Observational Cross-Sectional Study. British Medical Journal Open. 2023 Dec; 13(12): e078976. doi: 10.1136/bmjopen-2023-078976.

[15] World Health Organization. WHO Consolidated Guidelines on Tuberculosis: Module 3: Treatment and Care. 2025. https://www.who.int/publications/i/item/9789240107984.

[16] World Health Organization. WHO Consolidated Guidelines on Tuberculosis: Module 4: Treatment and Care. 2025. https://www.who.int/publications/i/item/9789240107243.

[17] World Health Organization. New WHO Guidance on HIV Viral Suppression and Scientific Updates Released at IAS 2023. 2023 May. https://www.who.int/news/item/23-07-2023-new-who-guidance-on-hiv-viral-suppression-and-scientific-updates-released-at-ias-2023.

[18] Xi J, Li PW, Yu DS. Multimorbidity: The Need for a Consensus on Its Operational Definition. Journal of Advanced Nursing. 2024 Dec; 80(12): 4755-7. doi: 10.1111/jan.16292.

[19] Yousuf FS, Arif A, Bibi R, Almas A. Association of Depression and Anxiety with Hypertensive Crisis: A Cross-Sectional Study from a Hospital Setting in Karachi, Pakistan. Cureus. 2022 Sep; 14(9). doi: 10.7759/cureus.29792.

[20] Shahbaz K, Alamgeer, Paudyal V, Zubair M, Safdar MZ, Tahir M *et al.* Prevalence and Impact of Psychological Disorders on Pharmacotherapy of Diabetic Patients in Low Resource Settings: A Prospective Assessment in Primary Healthcare Settings. Patient Preference and Adherence. 2024 Dec: 1939-48. doi: 10.2147/PPA.S463133.

[21] Fatima M, Wang Z, Din ZU, Juan L, Ke C, Xie P. Evidence-Based Prevalence of Diabetes Related Depression in Kohat, Pakistan: A Cross-Sectional Study. BioMed Central Public Health. 2025 May; 25(1): 1938. doi: 10.1186/s12889-025-23151-y.

[22] Iqbal R, Qureshi A, Jaffar R, Omair W, Imam AA, Khan UI. Cardiometabolic Multimorbidity and Symptoms of Common Mental Disorders in a Primary Healthcare System for Low-Income Urban Population in Pakistan. PLOS Global Public Health. 2025 Sep; 5(9): e0005140. doi: 10.1371/journal.pgph.0005140.

[23] Afaq S, Ayub A, Faisal MR, Nisar Z, Zala, Rehman AU *et al.* Depression Care Integration in Tuberculosis Services: A Feasibility Assessment in Pakistan. Health Expectations. 2024 Feb; 27(1): e13985. doi: 10.1111/hex.13985.

[24] Jaffry TN, Zulfiqar R, Shan H, Asif R, Hassan U, Tariq N. Perceived Stigma and Psychological Distress among Tuberculosis Patients: Insights into

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)

DOI: https://doi.org/10.54393/pbmj.v9i10.1416

Psychosocial Challenges at a Healthcare Center. Pakistan Journal of Public Health. 2024 Dec; 14(4): 256-60. doi: 10.32413/pjph.v14i4.1242.

[25] Yousaf D, Asif M, Saba M, Shakoor S, Bakhsh Khoso A, Chaudhry N. Anxiety and Social Functioning among People Living with HIV/AIDS (PLWHA) in Pakistan: A Cross-Sectional Study. Nature-Nurture Journal of Psychology. 2025; 4(2): 64-74. doi: 10.53107/nnjp.v4i2.80.

Copyright© 2026 The Authors. Published by CrossLinks International Publishers LLC, USA
This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0)