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ASSESSMENT OF PSYCHOLOGICAL DISTRESS IN HEART FAILURE PATIENTS. AN ANALYTICAL CROSS SECTIONAL STUDY FROM PESHAWAR, PAKISTAN

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Abstract

Heart failure (HF) is associated with substantial physical and psychological impairment which is why mental health screening rates in Pakistan are ignored. The present study was conducted to determine anxiety and depression rates in HF patients in Peshawar and to evaluate the existence of social-demographic factors.

The analytical cross-sectional study lasted six months, and three tertiary care hospitals, that is, Hayatabad Medical Complex, Lady Reading Hospital, and Rehman Medical Institute, were used. Convenience sampling was used to recruit 379 patients with HF age 18 years and above, and the diagnosis had been known for a minimum period of six months.

Hospital Anxiety and Depression Scale (HADS) in Urdu language was administered. The analysis of the data was performed in SPSS v27 based on the t-tests and ANOVA; the value of $p < 0.05$ was used as a significant one.
The anxiety mean score was 11.57 3.43 and depression mean score was 11.37 3.52 which is moderate. Patients of public hospitals ($p = 0.037$) and non-Muslims ($p = 0.012$) were recorded to have a greater anxiety and depression level. Younger adults (18 to 40 years), females, and non-educated persons also are likely to have higher distress albeit without statistical significance. The most reported were restlessness and loss of cheerfulness. Reliability of the tool was checked by Cronbach's alpha, which was 0.82–0.84 for the anxiety subscale and 0.947–0.948 for the depression subscale.
Psychological distress is quite common among patients who have HF in Peshawar with significant associations of religion and type of hospital. Screening and culturally competent psychosocial interventions should be incorporated into routine care of the heart to advance quality of life and clinical results.

INTRODUCTION

Heart failure (HF) is a chronic progressive condition in which the heart cannot pump sufficient blood to meet the body's needs, leading to symptoms such as shortness of breath, fatigue, and peripheral edema (Of, n.d.). It affects approximately 26 million people worldwide and remains a major public health concern (Ponikowski et al., 2016). In Pakistan, the estimated prevalence of HF is 2.5%, particularly among older adults, with risk factors such as diabetes, obesity, and mental health conditions contributing substantially to mortality (Rashid et al., 2023).

Gender differences exist in HF presentation. Men more commonly develop heart failure with reduced ejection fraction (HFrEF), often related to ischemic heart disease, whereas women more frequently experience heart failure with preserved ejection fraction (HFpEF), commonly associated with hypertension and diabetes (Squire, 2009; Wen et al., 2025). HFpEF is among the most prevalent forms of HF in Pakistan (Wen et al., 2025).

Beyond its physical manifestations, HF is frequently accompanied by psychological disorders, particularly depression and anxiety, which remain underdiagnosed and undertreated (Zheng et al., 2019; Özmen et al., 2025). Studies indicate that up to 60% of HF patients experience depressive symptoms and approximately 55% report high levels of anxiety (Sandeep et al., 2023). Depression is characterized by persistent sadness, loss of interest, fatigue, sleep disturbances, impaired concentration, and feelings of guilt or

worthlessness (Zhao et al., 2024). These conditions are associated with poorer clinical outcomes, including increased hospital readmissions, reduced treatment adherence, and higher mortality rates (Celano et al., 2018; Szabo et al., 2023). A meta-analysis reported that depression increases the risk of all-cause mortality by 40% and hospital readmission by 57% among HF patients (Gathright et al., 2017). Biological mechanisms such as neurohormonal dysregulation and increased inflammatory activity may further worsen cardiac function (Thomas et al., 2008).

Psychological distress in HF patients is influenced by factors such as financial difficulties, physical disability, inadequate social support, previous myocardial infarction, and device implantation (Html, 2013; Kovacs et al., 2022). However, these symptoms are often mistaken for manifestations of HF itself, resulting in delayed psychiatric assessment and treatment. The limited integration of mental health services into cardiac care, particularly in Pakistan, further contributes to under-recognition of these conditions. Early identification and management of psychological symptoms may improve quality of life and reduce healthcare utilization (Sokoreli et al., 2016).

Although interventions such as cardiac rehabilitation, counseling, and family-centered care have demonstrated effectiveness in reducing anxiety and depression (Zheng et al., 2019), mental health services remain underutilized in low-resource settings. In cities such as Peshawar, limited mental health resources and social stigma continue to restrict access to psychological care (Kovacs et al., 2022).

Despite the growing burden of HF in Pakistan, local evidence regarding psychological distress among HF patients remains scarce. Most available assessment tools are developed in Western settings and may not fully reflect local cultural contexts (Curth et al., 2020). Furthermore, the influence of sociodemographic factors such as age, gender, and socioeconomic status on psychological distress among HF patients in Peshawar remains poorly understood (Tsabedze et al., 2021). Therefore, this study aims to assess the levels of depression and anxiety among patients with heart failure and identify associated sociodemographic and clinical factors, contributing to improved screening, psychosocial support, and patient-centered cardiac care in Pakistan (Khan MA & Gul R, 2020; Moreira & Furegato, 2013).

Method

This study employed an analytical cross-sectional design to assess both exposures (such as demographic and clinical characteristics) and outcomes (psychological distress, including anxiety and depression among heart failure

patients) at a single point in time. While this design does not establish causality due to the lack of temporality, it is cost-effective and time-efficient, making it suitable for estimating prevalence and generating hypotheses in resource-limited settings. In this study, it allowed assessment of the association between psychological distress and patient-related factors without long-term follow-up, providing a "snapshot" of mental health burden among heart failure patients in Peshawar.

The study was conducted in three major tertiary care hospitals in Peshawar: Hayatabad Medical Complex (HMC), Lady Reading Hospital (LRH), and Rehman Medical Institute (RMI). HMC is a large public-sector tertiary care hospital with advanced cardiac facilities and a high influx of heart failure patients, making it suitable for capturing data from a broad socioeconomic population. LRH, one of the oldest and largest teaching hospitals in the region, serves a highly diverse population from both tribal and settled areas and has a high patient turnover, supporting adequate case recruitment. RMI, a leading private-sector hospital, provides modern cardiology and rehabilitation services and represents patients from middle- and upper-income groups, thereby contributing to socioeconomic diversity in the sample. Together, these settings ensured a balanced and representative sample across different healthcare sectors.

The study was carried out over a period of six months, allowing sufficient time for ethical approvals, data collection, and analysis, while ensuring proper participant recruitment and quality control procedures throughout the research process.

A total sample size of 379 was calculated using the OpenEpi sample size calculator based on previously reported prevalence of anxiety and depression among heart failure patients. The calculation used a 95% confidence interval, 5% margin of error, 56% response distribution, and an assumed population size of 1,000,000. Non-probability convenience sampling was used to recruit participants who were available and willing to participate, a method commonly applied in clinical research where random sampling is difficult due to logistical and ethical constraints.

Adult patients aged 18 years and above with a confirmed diagnosis of heart failure for at least six months and who provided informed consent were included in the study. Patients with cognitive impairments affecting response reliability and those who were terminally ill were excluded to maintain data validity and focus on chronic heart failure-related psychological distress.

Data were collected using the Hospital Anxiety and Depression Scale (HADS), administered in Urdu to ensure cultural and linguistic appropriateness. The tool has demonstrated strong reliability in previous Pakistani studies, with Cronbach's alpha values ranging from 0.82 to 0.84 for anxiety and 0.947 to 0.948 for depression. The questionnaire included sociodemographic variables

such as age, gender, and education level, along with standardized subscales for anxiety and depression. Data were collected through self-administered questionnaires, with research assistants available for clarification, and each participant required approximately 20–40 minutes to complete the tool.

Data analysis was performed using SPSS version 27. Descriptive statistics such as means and percentages were used to summarize demographic and clinical characteristics. Inferential statistics, including t-tests and one-way ANOVA, were applied to examine associations between psychological distress and categorical variables. A p-value of less than 0.05 was considered statistically significant.

Results

In this chapter, results of the study conducted to determine the Psychological Distress in Heart Failure Patients

Demographic Characteristics of Participants (n = 379)

Table 1: This table includes frequencies and percentages of categorical demographic variables.

Variable	Categories	n (%)
Age Group	18-40 years	47 (12.4%)
	41-60 years	195 (51.5%)
	61-80 years	137 (36.1%)
Gender	Male	233 (61.5%)
	Female	146 (38.5%)
Education Level	Matriculation	96 (25.3%)
	Undergraduate	19 (5.0%)
	Graduate	13 (3.4%)
	Non-Educated	251 (66.2%)
Marital Status:	Single	13 (3.4%)
	Widow	11 (2.9%)

	Married	351 (92.6%)
	Divorced	4 (1.1)
Religion	Muslim	373 (98.4)
	Non-Muslim	6 (1.6)
Hospital Type	Private	54 (14.2%)
	Public	325 (85.8%)

Demographic Profile of Participants

Table 1 shows the demographic characteristics of the sample (N = 379) by age, gender, education, marital status, religion, and hospital type. The majority of participants were in the age group 41 to 60 years (51.5%, n = 195), followed by the 61 to 80 years (36.1%, n = 137), and the least was in the 18 to 40 years (12.4%, n = 47). In terms of gender, males accounted for 61.5% (n = 233) and females accounted for 38.5% (n = 146) of the sample.

Educational levels were very diverse, with 66.2% (n = 251) reporting no education, 25.3% (n = 96) with a matric graduation, 5.0% (n = 19) with an undergraduate degree, and 3.4% (n = 13) with a graduate degree.

Most of the participants were married (92.6%, n = 351), with very low percentages being single (3.4%, n = 13), widowed (2.9%, n = 11), or divorced (1.1%, n = 4).

Religiously, 98.4% (n = 373) were Muslim and 1.6% (n = 6) were non-Muslim. Finally, the largest proportion of the participants were from public hospitals (85.8%, n = 325), followed by 14.2% (n = 54) from private hospitals. These demographics provide a clear picture of the study sample, with a heterogeneous but largely older, male, married, and not educated sample from public health units.

Table 2. Mean ± SD of Anxiety and Depression Scores by Demographic Variables with Statistical Test Results (n = 379)

Variable	Group	Anxiety (Mean ± SD)	Depression (Mean ± SD)	Statistical Test	p-value
Age Group	18–40 years	11.89 ± 3.23	11.44 ± 3.62	F=0.754	(0.746)
	41–60 years	11.64 ± 3.40	11.36 ± 3.39		
	61–80 years	11.35 ± 3.55	11.36 ± 3.69		
Gender	Male	11.54 ± 3.48	11.30 ± 3.56	t= 0.783	(0.377)
	Female	11.61 ± 3.36	11.48 ± 3.47		
Education Level	Matriculation	11.47 ± 3.07	11.0 ± 3.27	F=1.588	(0.065)
	Undergraduate	10.1 ± 3.10	10.0 ± 3.80		

	Graduate	11.46 ± 4.46	11.46 ± 5.30		
	Non-Educated	11.72 ± 3.51	11.61 ± 3.47		
Marital Status	Single	10.30 ± 3.40	11.30 ± 3.22	F=0.679	(0.824)
	Widow	10.45 ± 3.29	10.81 ± 3.25		
	Married	11.6 ± 3.42	11.41 ± 3.55		
	Divorced	8.75 ± 2.87	10.25 ± 2.62		
Religion	Muslim	11.55 ± 3.40	11.33 ± 3.50	t=6.38	(0.012)
	Non-Muslim	12.5 ± 5.46	14.16 ± 3.97		
Hospital Type	Private	9.57 ± 2.56	9.66 ± 2.65	t=4.38	(0.037)
	Public	11.90 ± 3.44	11.66 ± 3.57		

Anxiety and Depression Scores according to Demographic Variables

Table 2 presents mean ± SD of anxiety and depression scores by demographic variables with results of statistical tests (N = 379). Age group, gender, education level, marital status, religion, and type of hospital were examined using differences compared using ANOVA (F-test) for variables with greater than two categories and independent t-tests for binary variables.

Age Group: The 18–40 years group had the highest scores for anxiety (11.89 ± 3.23), followed by 41–60 years (11.64 ± 3.40) and 61–80 years (11.35 ± 3.55). Depressive scores were similar in groups with the means being 11.44 ± 3.62 (18–40 years), 11.36 ± 3.39 (41–60 years), and 11.36 ± 3.69 (61–80 years). No significant differences (F = 0.754, p = 0.746).

Gender: Males reported lower anxiety (11.54 ± 3.48) and depression scores (11.30 ± 3.56) compared to females (11.61 ± 3.36 for anxiety, 11.48 ± 3.47 for depression). These were not statistically significant (t = 0.783, p = 0.377).

Education Level: The non-educated volunteers had the highest anxiety (11.72 ± 3.51) and depression (11.61 ± 3.47) scores, while the undergraduates had the lowest (10.1 ± 3.10 for anxiety, 10.0 ± 3.80 for depression). The graduate subjects were more heterogeneous, particularly for depression scores (11.46 ± 5.30). Statistical variations in education levels were not significant (F = 1.588, p = 0.065).

Marital Status: Divorced respondents recorded the lowest (8.75 ± 2.87) and (10.25 ± 2.62) for anxiety and depression, respectively, while married respondents recorded the highest (11.6 ± 3.42) and (11.41 ± 3.55) for anxiety and depression, respectively. There was no difference (F = 0.679, p = 0.824).

Religion: Non-Muslims reported higher anxiety (12.5 ± 5.46) and depression (14.16 ± 3.97) scores compared to Muslims (11.55 ± 3.40 for anxiety, 11.33 ± 3.50 for depression). They were statistically significant (t = 6.38, p = 0.012).

Hospital Type: Public hospital participants had higher scores on anxiety (11.90 ± 3.44) and depression (11.66 ± 3.57) than private hospital participants (9.57 ± 2.56 for anxiety, 9.66 ± 2.65 for depression). These were statistically different (t = 4.38, p = 0.037).

Table 3. Mean and Standard Deviation of Individual HADS Items (n = 379)

Item	Mean	SD
HADS-Anxiety Items		
Q1: I feel tense or 'wound up'	1.40	1.06
Q3: I get a sort of frightened feeling	1.57	0.96
Q5: Worrying thoughts go through my mind	1.70	0.92
Q7: I can sit at ease and feel relaxed	1.60	0.90
Q9: I get sudden feelings of panic	1.81	0.90
Q11: I feel restless	1.89	0.93
Q13: I get a frightened feeling like 'butterflies' in the stomach	1.61	0.92
Total Anxiety (HADS-A)	11.57	3.43
HADS-Depression Items		
Q2: I still enjoy the things I used to	1.46	0.94
Q4: I can laugh and see the funny side	1.43	1.20
Q6: I feel cheerful	1.82	0.92
Q8: I feel as if I am slowed down	1.69	0.93
Q10: I have lost interest in appearance	1.50	0.93
Q12: I look forward with enjoyment	1.63	0.95
Q14: I can enjoy a good book or program	1.63	0.99
Total Depression (HADS-D)	11.37	3.52

Individual HADS Item Scores and Total Subscale Scores

(SD) for total and individual item scores on the anxiety (HADS-A) and depression (HADS-D) subscales of the Hospital Anxiety and Depression Scale (HADS) in 379 patients.

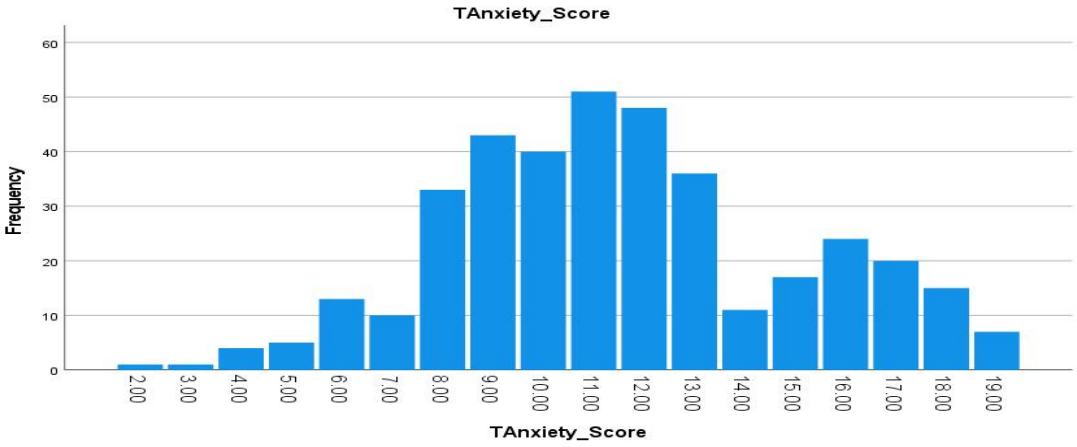
The overall mean anxiety score was 11.57 ± 3.43. Individual anxiety items' highest mean score was Q11 ("I feel restless," 1.89 ± 0.93), with frequent restlessness, and lowest mean score was Q1 ("I feel tense or 'wound up,' " 1.40 ± 1.06). Highest-scoring items were also Q9 ("I get sudden feelings of panic," 1.81 ± 0.90) and Q5 ("Worrying thoughts go through my mind," 1.70 ± 0.92),

reflecting frequent anxiety symptoms in the sample. Anxiety items' SDs ranged from 0.90 to 1.06, reflecting moderate response variability.

HADS-Depression Subscale: The mean total depression score was 11.37 ± 3.52. The highest mean score was for Q6 ("I feel cheerful," 1.82 ± 0.92, reverse-scored) with a tendency to be less cheerful, and Q4 ("I can laugh and see the funny side," 1.43 ± 1.20) was lowest in mean score. Other items, e.g., Q8 ("I feel as if I am slowed down," 1.69 ± 0.93) and Q12 ("I look forward with enjoyment," 1.63 ± 0.95), indicate moderate depressive symptoms. SDs for depression items ranged from 0.92 to 1.20, with Q4 having the highest range.

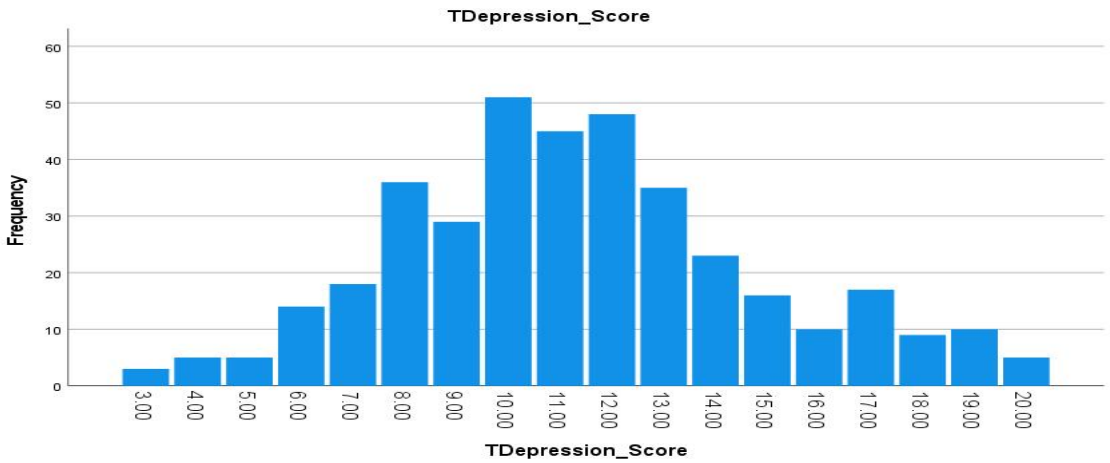
In general, the HADS measures moderate depression and anxiety in the sample, with loss of cheerfulness and restlessness as principal symptoms. The variability of response, particularly for depression items like Q4, indicates variation in depressive symptom experience among participants

Figure 1 Bar Chart of Total Anxiety Score



Scale	N	%	Mean ± SD	Min	Max
TAnxiety_Score	379	100%	11.57 ± 3.43	2.00	19.00

Figure 2 Bar chart of Total Depression Score



Scale	N	%	Mean ± SD	Min	Max
TDepression_Score	379	100%	11.38 ± 3.52	3.00	20.00

Discussion

we findings from this study determined the levels and presence of psychological distress—like anxiety and depression—among patients diagnosed with heart failure in the tertiary care hospitals of Peshawar: HMC, LRH, and RMI. Enrolled 379 patients, representing various age groups, socioeconomic levels and educational backgrounds. Heart failure the condition that not only effect cardiac function they also contribute to affect the mental health of the body. Our study aimed to find out how psychological distress manifests in this patient and what institutional factors or demographic may influence it.

The study revealed that patients between 18 and 40 years old demonstrated the highest levels of anxiety (11.89 ± 3.23) and depression (11.44 ± 3.62) compared to middle-aged (41–60: 11.64 ± 3.40, 11.36 ± 3.39) and older adults (61–80: 11.35 ± 3.55, 11.36 ± 3.69) although the differences were not statistically significant ($F = 0.754$; $p = 0.746$). The study by Ettman et al. (2020) demonstrated that young American adults under 40 experienced a significant increase in depression rates which rose from 8.5% to 27.8% during the COVID-19 pandemic. The parallel findings indicate that younger people face increased emotional vulnerability when dealing with uncontrolled health threats even when they have chronic illnesses.(Ettman et al., 2023)

Gender-specific distinctions were moderate: female patients with slightly higher average anxiety (11.61 ± 3.36) and depression (11.48 ± 3.47) scores than males (11.54 ± 3.48, 11.30 ± 3.56), although this tendency Not statistically significant ($t = 0.783$; $p = 0.377$). Salk, Hyde and Abramson (2017)

discovered that women are almost twice as many people in the general population to undergo depression experience. This testosterone deficiency was evident in our findings, where male patients had lower anxiety and depression scores compared to females, consistent with previous research Wenger et al.(2001). The gender difference seems to remain in our cardiac samples, although the effort may reduce the severity of differences due to the severity of the disease(Nishijima David L; Wisner, David H; Holmes, James F & Maxson & Mitchell, 2016)

With respect to the education level, the non-educated group had the highest scores in anxiety (11.72±3.51) and depression (11.61±3.47), and the undergraduate group had the lowest (10.1±3.10 and 10.0±3.80, respectively). This effect was at a trend level ($p = 0.065$). These results were in agreement with those obtained by Wleklik et al. (2025) found that more education in heart failure patients was associated with improved emotional and cognitive function. Patients who are educated often cope with the illness better, relieving psychological distress.(Wleklik et al., 2025)

It's pretty interesting, actually—our study found that even those at the graduate level still faced quite a bit of distress. You know, it seems like the deeper someone understands their illness, the more psychological challenges might come with that awareness. This could point to a non-linear relationship, kind of a U-shaped curve, between education and distress. Definitely something worth looking into more.

Now, when we looked at marital status, the results were a bit surprising. There wasn't a significant link to anxiety or depression ($p = 0.824$). However, it's worth noting that married folks had slightly higher anxiety scores (11.60 ± 3.42) compared to singles (10.30 ± 3.40). This kind of goes against the common belief that being married offers some sort of psychological safety net. For instance, Ettman and colleagues (2020) found that people who were widowed or separated actually reported worse depression after a crisis. It really underscores that it's not just about being married; the quality of social support and the context really matter.

Another striking takeaway from our findings was how religion plays into psychological well-being. Non-Muslim participants had notably higher anxiety (12.50 ± 5.46) and depression (14.16 ± 3.97) scores compared to their Muslim counterparts (11.55 ± 3.40 and 11.33 ± 3.50; $t = 6.38$, $p = 0.012$). This aligns well with Koenig's research from 2012, which pointed out that engaging in religious or spiritual practices can provide a sense of belonging, purpose, and emotional support—essentially, a buffer against psychological distress. In fact, in our mostly Muslim setting, it's likely that religious minorities might miss out on these protective factors.(Koenig, 2012)

You know, the type of hospital really seems to affect how stressed patients feel. It's pretty clear that folks in public hospitals reported higher levels of

anxiety—like an average of 11.90, plus or minus 3.44—and depression, sitting at about 11.66, give or take 3.57. In contrast, those in private hospitals had lower numbers: 9.57 and 9.66, respectively. The stats show a significant difference there ($t = 4.38$; $p = 0.037$).

Honestly, this kind of aligns with what we've seen in other healthcare research. Public hospitals often have a lot on their plate—overcrowded, under-resourced, you name it. All of that can really ramp up patient stress, thanks to things like long wait times, tight spaces, and not-so-great confidentiality. It's tough out there.(Tsabedze et al., 2021)

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Conclusion

This research brings to light the prevalent high level of psychological distress among heart failure patients in Peshawar's tertiary care hospitals. Application of the HADS scale showed that a very high percentage of patients exhibited severe to moderate levels of psychological symptoms. Demographic variables of age, gender, education, religion, and type of hospital were differentially related to mental health. Younger age (18–40 years) and female patients had slightly higher distress scores, though not always of a statistical nature. Non-Muslim patients and public hospital patients had higher anxiety and depression scores. Of specific interest was the finding that education was inversely related to psychological distress. These findings underscore the importance of mental health screening in cardiac care. Early identification and treatment could improve emotional functioning and clinical outcomes. The research lends further credence to the development of culturally appropriate, context-specific psychosocial interventions. Management of mental health in cardiac patients is needed in order to enhance their level of living. Future policy should be to embrace holistic, multidisciplinary models of care. This research is useful baseline information for continuing research and health planning in Pakistan

Limitations.

- The cross-country design restricts the ability to determine the cause of pressure between psychological stress and heart failure.
- The self-reported HADS questionnaire collected through the data may have caused a reaction or social attractiveness bias.
- The study was limited to hospitals in Peshawar, which limits normality in other areas or communities.
- No clinical variables have been considered, including comorbidities and severity of the disease.

- The use of non-probability sampling may have affected sample representativeness
- Literacy barriers among participants may have influenced the accuracy of responses.

Strength

- It addresses a significant yet neglected issue in Pakistan, the mental health of cardiac patients—a topic that typically gets overlooked in health studies in the region.
- Use of a validated tool (HADS) ensures accurate measurement of symptoms of anxiety and depression.
- A relatively large sample size (n = 379) gives you greater statistical power and validity for your result.
- With both public and private hospital patients covered, a larger portion of the population will be covered.
- The study provides useful baseline data that can guide policymaking and interventions in the future integration of cardiology and mental health.

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