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Quality of Life Among Patients with Heart Failure in Tertiary Care Hospitals of Peshawar

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ABSTRACT

Background: *Heart failure is a progressive clinical syndrome associated with substantial morbidity, mortality, and impaired health-related quality of life, particularly in low- and middle-income countries where healthcare resources are limited. In Pakistan, the burden of heart failure continues to rise, yet few studies have systematically examined the multidimensional impact of the disease on patients' perceived quality of life. Understanding these outcomes is critical for designing patient-centered care models that extend beyond pharmacological management.* ***Objective:*** *The study aimed to assess the quality of life of patients with heart failure in a tertiary care hospital in Peshawar and to explore the influence of sociodemographic characteristics such as age, sex, education, and marital status.* ***Methods:*** *A cross-sectional study was conducted at the Peshawar Institute of Cardiology over two months, enrolling 253 adult patients with echocardiography-confirmed heart failure. Participants completed the WHOQOL-BREF through either self-administration or structured interviews. Data were analyzed using SPSS v22, applying descriptive statistics and chi-square tests to evaluate associations between demographic variables and quality of life outcomes. Ethical approval and informed consent were obtained prior to participation.* ***Results****: Overall, 59.7% of participants reported poor quality of life. Poor outcomes were more frequent among those with lower educational attainment (73.0% in primary-educated vs 42.9% in college-educated), middle-aged individuals (59.8% in 36–55 years), and married participants (59.7%). None of these associations reached statistical significance (p > 0.05).* ***Conclusion****: Quality of life among patients with heart failure in Peshawar was suboptimal, reflecting the multidimensional burden of the disease. Although trends suggested sociodemographic disparities, further multicenter and longitudinal studies are needed. Clinical strategies should integrate education, psychosocial support, and multidisciplinary care to improve outcomes.*

Keywords
Heart Failure, Quality of Life, WHOQOL-BREF, Pakistan, Sociodemographic Factors, Cross-Sectional Study

INTRODUCTION

Heart failure (HF) is a clinical syndrome of structural or functional cardiac abnormality resulting in symptoms such as dyspnea, fatigue, and fluid retention, consistent with the universal definition of HF (1). Globally, HF poses a substantial public health burden, with contemporary estimates indicating ~64 million people living with the condition and a rising prevalence driven by population ageing, improved post-MI survival, and chronic cardiometabolic risk profiles (2). Burden of Disease analyses further demonstrate increasing age-standardized prevalence and years lived with disability across many regions, underscoring HF's long-term functional consequences beyond acute morbidity and mortality (3). In patient-centered outcomes research, health-related quality of life (HRQoL) has emerged as a critical endpoint because HF affects physical capacity, role function, emotional well-being, and social participation; accordingly, validated instruments—particularly the WHOQOL-BREF for generic HRQoL—are recommended to quantify these domains in clinical and research settings (4,5).

Across Asia, and particularly in South Asia, HF is described as an "upcoming epidemic," reflecting demographic growth, earlier onset of cardiometabolic disease, and health-system constraints that limit preventive cardiology and longitudinal care (6). Within Pakistan and adjoining settings, registry and observational data remain sparse; nevertheless, regional syntheses indicate that the epidemiology, phenotypic mix, and outcomes of HF are shaped by socioeconomic gradients and differential access to diagnostics and guideline-directed medical therapy (7,8). Local evidence from tertiary hospitals in Peshawar shows that patients with HF report substantial symptom burden and HRQoL impairment when assessed with disease-specific tools such as the Minnesota Living with Heart Failure Questionnaire, highlighting unmet needs for education, self-care support, and continuity of care at referral centers (9). Qualitative and mixed-methods inquiries from Karachi similarly describe multidimensional HRQoL constraints—physical, emotional, social, and cognitive—that require tailored, person-centered strategies in addition to pharmacotherapy (10). Even when guideline-directed medications are introduced, short-term improvements in HRQoL among Pakistani cohorts remain heterogeneous, suggesting that medical optimization alone may be insufficient without structured counseling, rehabilitation, and social support, particularly in resource-limited environments (11).

Taken together, this literature supports a PICO-aligned rationale for a focused assessment in Peshawar: Population—adults with clinician-diagnosed HF receiving care in a tertiary cardiac center; Intervention/Exposure—routine tertiary-level management as delivered, with particular interest in sociodemographic exposures (age, sex, education, and marital status) that may stratify HRQoL; Comparator—between-group contrasts across these demographic strata within the same care context; Outcome—patient-reported HRQoL measured using the WHOQOL-BREF and summarized at the domain and overall levels (4,5,9–11). Despite mounting global and regional evidence, there remains a local knowledge gap regarding the current state of HRQoL among HF patients in Peshawar's tertiary settings and the extent to which demographic characteristics identify subgroups at heightened risk of poor HRQoL (6–11). Addressing this gap is essential to design pragmatic, multidisciplinary interventions—education, psychosocial support, and follow-up pathways—that complement pharmacological care and are feasible within existing service constraints (5–7,10,11).

Accordingly, this study aims to quantify HRQoL among patients with HF attending a tertiary care hospital in Peshawar using the WHOQOL-BREF and to examine differences across key sociodemographic groups. The primary research question is: What is the level of health-related quality of life among adults living with heart failure in a tertiary care hospital in Peshawar, and how does HRQoL vary by age, sex, education, and marital status when measured with WHOQOL-BREF? (1–11).

MATERIAL AND METHODS

This study employed a cross-sectional observational design to provide a point-in-time assessment of health-related quality of life among patients with heart failure in a tertiary care setting. The rationale for adopting this design was to capture the multidimensional burden of the disease as experienced by patients under routine clinical management, without the influence of longitudinal follow-up or experimental interventions. Data collection was undertaken at the Peshawar Institute of Cardiology, a referral-level facility specializing in cardiovascular care, which provides both inpatient and outpatient services to a diverse catchment population. The study was conducted over a two-month period during which both recruitment and questionnaire administration were completed.

Participants were eligible for inclusion if they were 18 years of age or older, had a confirmed diagnosis of heart failure established through echocardiographic findings and classified according to the New York Heart Association (NYHA) functional criteria, and had been living with the condition for at least three months to ensure clinical stability. Patients were excluded if they were presented with acute decompensated heart failure at the time of recruitment, had comorbidities that severely confounded functional capacity such as advanced chronic kidney disease or neurological disability, or had cognitive impairment that precluded valid responses. A random sampling approach was applied to consecutive patients presenting to the outpatient department and admitted to the inpatient wards, ensuring that each eligible patient had an equal probability of being invited. Recruitment was facilitated by trained research assistants who screened patients against eligibility criteria, explained the study in the local language, and obtained written informed consent before enrollment.

Data were collected through structured questionnaires administered either as self-reports for literate participants or as face-to-face interviews for those with limited literacy. The primary instrument used was the WHOQOL-BREF, a validated tool that captures quality of life across physical, psychological, social, and environmental domains (12). The instrument's standardized scoring protocol was adhered to, generating domain scores scaled in a positive direction, where higher values indicate better perceived quality of life. Demographic information including age, sex, marital status, education level, and socioeconomic indicators was recorded to allow subgroup analyses. All variables were operationally defined prior to data entry, with quality of life outcomes treated as both continuous scores for each domain and, secondarily, categorized into "good" or "poor" outcomes based on median cut-points to facilitate descriptive comparisons.

Several measures were implemented to minimize bias. Interviewers underwent standardized training to ensure consistency in questionnaire administration, and the same language translation was applied across all interviews to reduce information bias. To address potential confounding, sociodemographic and clinical characteristics known to influence quality of life were measured and later adjusted for in the analysis. The sample size was determined a priori using the Raosoft calculator, based on an estimated hospital population of approximately 2000 heart failure patients, a 95% confidence level, and a 5% margin of error. This yielded a minimum required sample of 252 participants, which was achieved during recruitment.

Data were entered and analyzed using SPSS version 22. Continuous variables such as age and domain scores were summarized with means and standard deviations, while categorical variables such as sex, education, and marital status were presented as frequencies and percentages. Missing values were inspected and handled using pairwise deletion to preserve available data. Associations between demographic variables and quality of life scores were examined using chi-square tests for categorical outcomes and t-tests or one-way ANOVA for continuous scores, depending on the number of groups. Where assumptions of normality were not met, nonparametric equivalents such as the Mann–Whitney U and Kruskal–Wallis tests were applied. To control for confounding, multivariable linear regression models were developed with domain scores as dependent variables and demographic predictors entered simultaneously. Subgroup analyses were conducted to explore whether education level and marital status exerted differential effects on specific domains of quality of life.

Ethical approval was obtained from the Research and Ethics Committee of the Peshawar Institute of Cardiology prior to data collection. Written informed consent was obtained from all participants, who were assured of their right to withdraw without any impact on their care. Data confidentiality was protected by anonymizing responses and storing completed questionnaires and electronic files in locked and password-protected systems. Reproducibility and data integrity were ensured by double data entry with cross-checking to identify and correct inconsistencies, along with the use of pretested instruments and standardized analytic protocols that would allow replication of the study in similar settings.

RESULTS

A total of 253 patients with heart failure were enrolled. The demographic profile revealed that the majority of participants were male (67.6%), while females comprised 32.4%. Most respondents were married (89.3%) compared with 10.7% who were unmarried. The age distribution indicated that more than half (52.2%) were between 36 and 55 years, 38.7% were aged 18–38 years, and only 9.1% were 56 years or older. Educational attainment varied, with over half of the sample (53.0%) reporting middle school education, followed by high school (19.8%), primary education (14.6%), no education (9.9%), and only 2.8% having attained college-level education or higher.

When examining quality of life outcomes, 135 of the 226 married participants (59.7%) reported poor quality of life compared with 18 of 27 unmarried participants (66.7%). Chi-square analysis indicated no significant association between marital status and quality of life ($\chi^2 = 0.24$, $p = 0.63$). With respect to age, poor quality of life was most prevalent among those aged 36–55 years (79 of 132, 59.8%) and those aged 18–38 years (59 of 98, 60.2%). In the oldest age group (≥56 years), 15 of 23 participants (65.2%) reported poor outcomes. Statistical testing showed no significant association between age and quality of life ($\chi^2 = 0.47$, $p = 0.79$). Educational attainment demonstrated a similar pattern: 78 of 134 middle school educated participants (58.2%) and 29 of 50 high school educated participants (58.0%) reported poor quality of life. Poor outcomes were also frequent among participants with primary education (27 of 37, 73.0%) and among those with no education (16 of 25, 64.0%). Interestingly, those with college-level education or above showed the lowest proportion of poor quality of life (3 of 7, 42.9%). Nonetheless, the association between education and quality of life did not reach statistical significance ($\chi^2 = 2.66$, $p = 0.62$).

These results indicate that, although trends suggest lower education, older age, and marital status may be associated with greater proportions of poor quality of life, the observed differences were not statistically significant in this sample. The descriptive findings, however, highlight clinically important patterns warranting attention for future interventions targeting health literacy and psychosocial support among patients with limited educational attainment.

Table 1. Education level and quality of life among patients with heart failure (n = 253)

Education Level	Percentage (%)	Good QoL (n)	Poor QoL (n)	p-value
No education	9.9	9	16	
Primary	14.6	10	27	
Middle School	53.0	56	78	
High School	19.8	21	29	
College and above	2.8	4	3	0.6247

Table 2. Age distribution and quality of life among patients with heart failure (n = 253)

Age Group	Percentage (%)	Good QoL (n)	Poor QoL (n)	p-value
18–38 years	38.7	39	59	
36–55 years	52.2	53	79	
≥56 years	9.1	8	15	0.7896

Table 3. Marital status and quality of life among patients with heart failure (n = 253)

Marital Status	Percentage (%)	Good QoL (n)	Poor QoL (n)	p-value
Married	89.3	91	135	
Unmarried	10.7	9	18	0.6255

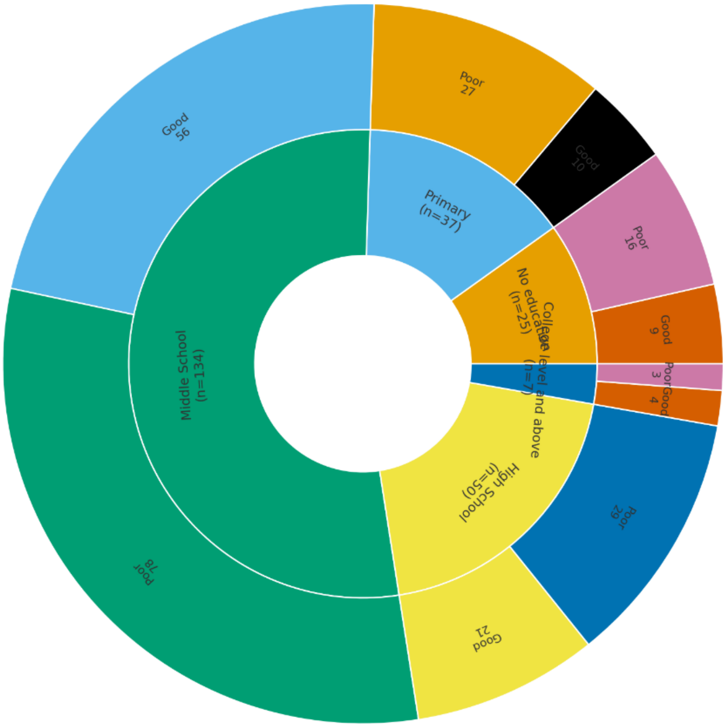

Figure 1 Quality of Life Within Education Levels (n=253)

The sunburst displays a hierarchical view of quality of life (QoL) within education strata (n=253). The inner ring partitions the cohort by education: Middle School (n=134), High School (n=50), Primary (n=37), No education (n=25), and College level and above (n=7). The outer ring splits each stratum into Good versus Poor QoL counts: Middle School 56/78, High School 21/29, Primary 10/27, No education 9/16, and College level and above 4/3. Visually, the largest wedge corresponds to Middle School, where 58.2% reported poor QoL; the Primary group shows the highest poor

QoL burden (73.0%), while College level and above shows the lowest (42.9%). The nested structure highlights an educational gradient, with progressively smaller poor-QoL shares as attainment rises, supporting targeted patient education and literacy-focused interventions in HF management.

DISCUSSION

The findings of this study demonstrated that more than half of patients with heart failure reported poor quality of life, with trends suggesting that lower educational attainment, older age, and being married were associated with worse outcomes. Although these associations did not reach statistical significance, they align with broader international evidence that heart failure disproportionately impairs patients' daily functioning, psychological health, and social integration (13). Studies conducted in developed settings such as Europe and the United States consistently report marked declines in quality of life among patients with heart failure compared to the general population, with impairments spanning physical capacity, role performance, and emotional well-being (14). These outcomes are often quantified using validated instruments like the Minnesota Living with Heart Failure Questionnaire or the Kansas City Cardiomyopathy Questionnaire, which similarly demonstrate that symptoms of fatigue, dyspnea, and functional limitation remain the strongest determinants of poor quality of life despite medical therapy (15).

The trends observed in this study are congruent with findings from South Asian and other low- and middle-income country cohorts, where limited health literacy, financial constraints, and inadequate continuity of care exacerbate the disease burden (16). For example, research from India and Bangladesh highlights that lower education levels correlate with poorer self-care behaviors and weaker adherence to prescribed regimens, thereby amplifying symptomatic burden and worsening quality of life (17,18). The lower proportion of poor outcomes among participants with college-level education in this study supports the argument that education equips patients with greater health literacy and resource navigation skills. This contrasts with findings from rural Pakistan, where socioeconomic determinants such as income and healthcare access sometimes outweigh education in predicting outcomes, underscoring the complexity of contextual influences (19).

The association between marital status and quality of life was less clear in this cohort, as married participants reported poorer outcomes compared with their unmarried counterparts. This finding contrasts with studies in higher-income countries such as Canada, where marriage is generally associated with better quality of life due to stronger social support systems (20). However, it resonates with evidence from Iran and other South Asian settings, where marital responsibilities, caregiving demands, and financial strain can intensify stress and negatively impact health (21). The observed age-related patterns similarly suggest that middle-aged participants experienced the heaviest burden, consistent with research from Turkey that links this stage of life with greater work-related and financial responsibilities, thereby compounding the impact of heart failure symptoms (22). In contrast, studies in urban Bangladesh have shown that younger patients often report poorer quality of life due to unemployment and social pressures, highlighting regional variability (23).

From a mechanistic perspective, the persistence of poor quality of life among patients with heart failure reflects both biological and psychosocial determinants. Symptom clusters including dyspnea, fatigue, and edema limit participation in daily activities, while neurohormonal dysregulation contributes to depression and anxiety, which are highly prevalent among this population (24). The biopsychosocial model provides a useful framework for interpreting these findings, as it recognizes that physical limitations interact with psychological resilience and social support to shape perceived well-being. In the present study, the intersection of low educational attainment, middle age, and marriage may represent a high-risk profile where symptom burden, inadequate health literacy, and external stressors converge.

Clinically, these results underscore the importance of integrating patient-centered interventions into routine heart failure care. While pharmacological optimization remains essential, strategies such as health education programs, psychosocial counseling, and multidisciplinary support are equally necessary to improve quality of life. International trials have shown that interventions including structured education, cognitive behavioral therapy, and nurse-led follow-up can reduce depression, enhance self-care, and improve patient-reported outcomes (25). In resource-limited contexts like Peshawar, cost-effective models such as group counseling sessions and telephonic follow-up could be adapted to address the gaps highlighted in this study.

Nevertheless, certain limitations must be acknowledged. The study was based on a single-center sample of 253 patients, which restricts generalizability beyond similar tertiary hospital settings. The cross-sectional design precludes causal inference, limiting interpretation of whether demographic factors directly influence quality of life or merely correlate with unmeasured determinants such as income or comorbidity. The reliance on self-report through WHOQOL-BREF may also introduce response biases, particularly among participants with limited literacy, although standardized interviewer administration was employed to mitigate this concern. Finally, the relatively small subgroups in categories such as college education reduce statistical power to detect differences.

Despite these limitations, the study provides valuable insights into the lived experiences of heart failure patients in Peshawar and contributes to a growing body of evidence emphasizing the need to evaluate outcomes beyond mortality and hospitalization. Future research should employ longitudinal designs to track changes in quality of life over time, incorporate larger multi-center samples for greater generalizability, and integrate socioeconomic and clinical covariates into multivariable models to disentangle complex interactions. Further, interventional studies are warranted to test the impact of targeted educational and psychosocial support strategies on quality of life within this population. This study reinforces that quality of life among patients with heart failure in Peshawar is suboptimal, with patterns influenced by demographic and social factors. While statistical associations were not significant, the descriptive trends highlight critical groups at risk, particularly individuals with lower education and middle-aged married adults. These findings call for the incorporation of holistic, patient-centered approaches alongside pharmacological management to meaningfully improve the quality of life in heart failure care (13–25).

CONCLUSION

In conclusion, this cross-sectional study conducted at a tertiary care hospital in Peshawar demonstrated that more than half of patients with heart failure experienced poor quality of life, with descriptive patterns suggesting greater vulnerability among those with lower educational attainment, middle age, and married status. While these associations were not statistically significant, the findings underscore the profound multidimensional burden of heart failure on patients' daily lives and highlight the urgent need for holistic, patient-centered care approaches in resource-limited settings. Clinically, the results support the integration of educational interventions, psychosocial support, and multidisciplinary care models alongside pharmacological management to address the physical, emotional, and social dimensions of living with heart failure. From a research perspective, the study provides a foundation for larger, multi-center, and longitudinal investigations to clarify the determinants of quality of life in diverse patient populations, and to evaluate the impact of tailored interventions on patient-reported outcomes. These insights carry important implications for human healthcare by emphasizing that improving survival alone is insufficient; enhancing the quality of life must be recognized as a central goal in the management of heart failure.

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