

Psychological Burden and Adaptive Responses in Coronary Heart Disease: A Clinical Evaluation of Comorbid Mental Health, Quality of Life, and Coping Patterns

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Abstract:

Background: Coronary heart disease (CHD) is a chronic cardiovascular condition whose impact extends beyond physical manifestations. Persistent concerns regarding recurrent cardiac events, functional limitations, treatment requirements, and long-term health may contribute to psychological distress. Depression and anxiety may adversely affect quality of life and influence how patients adapt to chronic cardiac illness. Coping strategies may further contribute to differences in psychological adjustment and perceived well-being.

Methodology: A hospital-based cross-sectional observational study was conducted among 120 patients with established CHD at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India, from 5 January 2025 to 31 October 2025. Sociodemographic and clinical information was collected using a structured proforma. Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9), anxiety using the Generalized Anxiety Disorder-7 (GAD-7), quality of life using the WHOQOL-BREF, and coping responses using the Brief COPE inventory. Associations between psychological symptoms, quality of life, and coping patterns were assessed using appropriate descriptive and inferential statistical methods. Multivariable linear regression was performed to identify factors independently associated with overall quality of life.

Results: Among the 120 participants, the mean age was 57.6 ± 10.8 years, and 78 (65.0%) were males. Clinically relevant depressive symptoms (PHQ-9 ≥ 10) were identified in 43 (35.8%) participants, while clinically relevant anxiety symptoms (GAD-7 ≥ 10) were present in 39 (32.5%). Participants with clinically relevant depressive symptoms had significantly lower WHOQOL-BREF scores across the physical, psychological, social-relationship, and environmental domains ($p \leq 0.001$). Similarly, clinically relevant anxiety was associated with significantly poorer quality-of-life scores across all assessed domains ($p \leq 0.004$). PHQ-9 scores demonstrated a significant inverse correlation with overall quality of life ($r = -0.62$, $p < 0.001$), while GAD-7 scores showed a similar inverse correlation ($r = -0.55$, $p < 0.001$). Adaptive coping was positively associated with overall quality of life ($r = 0.48$, $p < 0.001$), whereas maladaptive coping showed an inverse association ($r = -0.51$, $p < 0.001$). In multivariable analysis, higher PHQ-9, GAD-7, and maladaptive coping scores were independently associated with poorer quality of life, whereas greater adaptive coping was associated with better quality-of-life scores.

Conclusion: Psychological distress represents an important component of the overall burden experienced by patients with CHD. Depressive and anxiety symptoms were associated with poorer quality of life, while adaptive coping was associated with more favourable quality-of-life outcomes. These findings support the incorporation of psychological and coping assessment into comprehensive cardiovascular care to facilitate identification of patients who may benefit from additional psychosocial support.

Recommendation: Routine screening for depressive and anxiety symptoms should be considered in patients with established CHD, particularly those experiencing persistent distress or impaired functioning. A multidisciplinary approach incorporating psychological counselling, social support, patient education, and coping-focused interventions may help address the psychosocial needs of patients with chronic coronary disease.

Keywords: Coronary Heart Disease; Psychological Burden; Depression; Anxiety; Quality Of Life; Coping; Adaptive Responses; Cardiovascular Disease.

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Introduction

Coronary heart disease (CHD) is a major chronic cardiovascular condition associated with substantial morbidity, mortality, functional limitation, and long-term healthcare requirements. Although advances in cardiovascular diagnosis and treatment have improved survival, many patients continue to experience persistent physical and psychosocial consequences following the diagnosis of CHD. Consequently, contemporary cardiovascular care increasingly recognizes that successful management should address not only cardiovascular risk and clinical outcomes but also the patient's psychological and social well-being. [1]

The relationship between psychological factors and CHD is complex and potentially bidirectional. Psychosocial stress, social support, depression, anxiety, and other emotional factors have been associated with the development and prognosis of coronary disease. Prospective evidence has demonstrated associations between psychosocial factors and both the aetiology and prognosis of CHD, although the magnitude and consistency of these relationships vary according to the specific psychological factor and study population. [2]

Depression is particularly important in patients with CHD. A large meta-analysis involving more than 146,000 participants found that depression was associated with increased risk of subsequent coronary events and poorer prognosis among individuals with CHD. [3] Subsequent meta-analytic evidence has similarly demonstrated an association between depressive symptoms and increased mortality among patients with established CHD. [4] These findings indicate that depression should not be regarded simply as an emotional reaction to cardiac disease but as an important component of the overall clinical burden.

The association between depression and cardiovascular disease may also extend to individuals without previously diagnosed CHD. A meta-analysis of prospective cohort studies reported that depression was associated with an increased risk of CHD and myocardial infarction, supporting the importance of psychological health within the broader cardiovascular disease framework. [5] The timing and persistence of depressive symptoms may also be relevant, as evidence suggests that depression developing after the onset of CHD may be associated with adverse cardiac outcomes. [6]

Anxiety represents another important psychological concern in patients with coronary disease. A meta-analysis of prospective studies involving nearly

250,000 individuals found that anxiety was associated with increased risk of incident CHD and cardiac death. [7] Systematic reviews have also highlighted the frequent occurrence of anxiety among patients with established CHD and the need for effective recognition and management of anxiety symptoms within cardiovascular care. [8]

Psychological comorbidity can substantially influence patients' perception of their health and everyday functioning. Depression has been consistently associated with poorer health-related quality of life in people with CHD. A systematic review of prospective studies found that most included studies demonstrated a significant association between depression and subsequent physical health-related quality of life. [9] Similarly, reviews examining factors associated with quality of life among patients with coronary disease have identified depression, anxiety, mood disturbance, clinical symptoms, and inadequate social support as important psychosocial determinants of poorer health-related quality of life. [10]

Quality of life is therefore an important patient-centred outcome in CHD research. Unlike purely biomedical measures, quality-of-life assessment captures the patient's perception of physical health, psychological state, social relationships, and environmental circumstances. The WHOQOL-BREF was developed as a shorter version of the WHOQOL-100 and provides assessment across physical, psychological, social-relationship, and environmental domains. [11] Its multidimensional structure makes it useful for evaluating the broader consequences of chronic cardiovascular illness.

Reliable assessment of psychological symptoms is similarly important. The Patient Health Questionnaire-9 (PHQ-9) is a brief instrument designed to assess depressive symptom severity and has demonstrated satisfactory validity for use in clinical settings. [12] The Generalized Anxiety Disorder-7 (GAD-7) provides a brief measure for identifying and assessing the severity of anxiety symptoms and has demonstrated good reliability and validity. [13] Use of standardized instruments allows psychological symptoms to be quantified systematically and facilitates comparison across patient groups.

In addition to psychological symptoms themselves, the manner in which patients respond to chronic illness may influence their adaptation and quality of life. Coping encompasses cognitive and behavioural strategies used to manage stressful circumstances. The Brief COPE was developed as a concise measure covering multiple coping

responses and has been used in health-related research to assess different approaches to managing stress. [14] Earlier longitudinal research among patients with CHD has also examined approach and avoidance coping in relation to anxiety, depression, and well-being, supporting the relevance of coping behaviour when evaluating psychological adaptation to coronary disease. [15]

Despite increasing recognition of the psychological dimensions of CHD, psychological assessment is not consistently integrated into routine cardiovascular care. Furthermore, depression, anxiety, quality of life, and coping are often examined independently rather than as interconnected components of adaptation to chronic cardiac illness. A comprehensive evaluation of these domains may therefore provide clinically useful information about the psychosocial needs of patients with CHD.

The present study was undertaken to evaluate the psychological burden and adaptive responses among patients with established CHD, with particular emphasis on depressive symptoms, anxiety, quality of life, and coping patterns. The study also sought to examine the relationships between psychological symptom severity, quality of life, and different coping responses.

Methodology

Study Design: This was a hospital-based cross-sectional observational study conducted to evaluate psychological burden, quality of life, and coping patterns among patients with established coronary heart disease (CHD). The study specifically assessed depressive symptoms, anxiety symptoms, quality of life, and coping responses and examined their interrelationships.

Study Setting: The study was conducted at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India.

Study Duration: The study was conducted over a period of approximately 10 months, from 5 January 2025 to 31 October 2025.

Study Population: The study population comprised adult patients with an established diagnosis of coronary heart disease who attended the study hospital during the study period. Eligible participants were approached during their hospital visit and were enrolled after assessment against the predefined inclusion and exclusion criteria.

Sample Size: A total of 120 patients with established coronary heart disease were included in the study.

Inclusion Criteria: Participants were eligible for inclusion if they:

1. Were aged 18 years or older.

2. Had a documented diagnosis of coronary heart disease.
3. Were clinically stable and sufficiently well to participate in the assessment.
4. Were able to understand the study questions and complete the study instruments.
5. Provided written informed consent for participation.

Exclusion Criteria: Patients were excluded if they:

1. Had severe cognitive impairment that interfered with their ability to complete the assessment.
2. Had an acute medical condition requiring immediate emergency management.
3. Had significant communication difficulties that prevented reliable completion of the study instruments.
4. Had a severe previously diagnosed psychiatric disorder requiring intensive psychiatric management.
5. Declined or withdrew consent to participate.

Data Collection: After obtaining written informed consent, demographic and clinical information was collected using a structured study proforma. The recorded variables included age, sex, marital status, educational status, occupation, cardiovascular risk factors, duration of CHD, history of myocardial infarction, associated medical conditions, and current cardiovascular treatment.

Participants subsequently underwent standardized assessment of depressive symptoms, anxiety, quality of life, and coping responses. All assessments were conducted in a manner that maintained participant privacy and confidentiality.

Assessment of Depressive Symptoms: Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 consists of nine items corresponding to the diagnostic criteria for depressive symptoms and assesses symptom frequency during the preceding two weeks. Each item is scored from 0 to 3, giving a total score ranging from 0 to 27, with higher scores indicating greater depressive symptom severity.

For analysis, PHQ-9 scores were categorized as follows:

- **0–4:** Minimal or no depression
- **5–9:** Mild depression
- **10–14:** Moderate depression
- **15–19:** Moderately severe depression
- **20–27:** Severe depression

A PHQ-9 score of ≥ 10 was considered indicative of clinically relevant depressive symptoms for comparative analyses.

Assessment of Anxiety Symptoms: Anxiety symptoms were assessed using the Generalized

Anxiety Disorder-7 (GAD-7) scale. The GAD-7 consists of seven items assessing the frequency of anxiety-related symptoms during the preceding two weeks. Each item is scored from 0 to 3, resulting in a total score ranging from 0 to 21, with higher scores indicating greater anxiety symptom severity.

GAD-7 scores were categorized as:

- **0–4:** Minimal anxiety
- **5–9:** Mild anxiety
- **10–14:** Moderate anxiety
- **15–21:** Severe anxiety

A GAD-7 score of ≥ 10 was considered indicative of clinically relevant anxiety symptoms for comparative analyses.

Assessment of Quality of Life: Quality of life was assessed using the World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire. The instrument evaluates quality of life across four major domains:

- Physical health
- Psychological health
- Social relationships
- Environment

Domain scores were calculated according to the established WHOQOL-BREF scoring procedure, with higher scores indicating better perceived quality of life. The domain scores were used for comparison according to depressive and anxiety symptom status and for correlation analyses with psychological symptom and coping scores.

Assessment of Coping Patterns: Coping responses were assessed using the Brief COPE inventory, which evaluates different cognitive and behavioural strategies used by individuals to manage stressful circumstances.

For the present analysis, coping responses were grouped into adaptive and potentially maladaptive coping patterns based on the conceptual relevance of the individual Brief COPE subscales.

The adaptive coping category included:

- Active coping
- Planning
- Acceptance
- Positive reframing
- Emotional support
- Instrumental support

The potentially maladaptive coping category included:

- Behavioural disengagement
- Self-blame
- Denial
- Substance-related coping

Higher scores within each category indicated greater use of the corresponding coping responses. The coping categories were subsequently examined in relation to depressive symptoms, anxiety symptoms, and quality-of-life measures.

Assessment of Clinical Characteristics: Clinical information was obtained from the participant's clinical records and history. The assessment included the presence of major cardiovascular risk factors and relevant clinical characteristics, including hypertension, diabetes mellitus, dyslipidaemia, smoking status, previous myocardial infarction, family history of CHD, and the presence of multiple cardiovascular risk factors.

Participants were also assessed regarding the duration and clinical history of CHD and ongoing cardiovascular treatment.

Statistical Analysis: Data were entered into a computerized database and analyzed using appropriate statistical procedures. Continuous variables were summarized using mean $\pm$ standard deviation (SD), while categorical variables were presented as frequencies and percentages.

The distribution of continuous variables was assessed before selection of the appropriate statistical test. For comparison of continuous variables between two groups, the independent-samples t-test was used for approximately normally distributed variables, while the Mann–Whitney U test was used for non-normally distributed variables. Comparisons involving more than two groups were performed using one-way analysis of variance (ANOVA) for normally distributed data or the Kruskal–Wallis test for non-parametric data.

Associations between categorical variables were assessed using the chi-square test or Fisher's exact test, as appropriate.

Relationships between PHQ-9 scores, GAD-7 scores, WHOQOL-BREF domain scores, and coping measures were evaluated using Pearson's correlation coefficient for normally distributed continuous variables or Spearman's rank correlation coefficient for non-normally distributed variables.

A multivariable linear regression analysis was performed to identify factors independently associated with overall quality-of-life scores. Overall quality of life was considered the dependent variable, while relevant demographic, clinical, psychological, and coping variables were considered as potential explanatory variables. The regression model included age, sex, duration of CHD, PHQ-9 score, GAD-7 score, adaptive coping score, and maladaptive coping score.

Regression results were expressed using regression coefficients with corresponding standard errors, 95% confidence intervals, and p-values. The

coefficient of determination (R^2) and adjusted R^2 were used to assess the explanatory performance of the model.

All statistical tests were two-sided, and a p-value <0.05 was considered statistically significant.

Ethical Considerations: The study was conducted in accordance with accepted ethical principles governing research involving human participants. Institutional Ethical Committee approval was obtained before commencement of the study. Written informed consent was obtained from all participants after providing an explanation of the study objectives, procedures, potential benefits, and voluntary nature of participation.

Participation was voluntary, and participants were informed that refusal to participate or withdrawal from the study would not affect their medical treatment. Participant confidentiality was

maintained throughout data collection, data analysis, and reporting. Identifying information was not disclosed in the study report.

Results

Demographic Characteristics: A total of 120 patients with established coronary heart disease (CHD) were included in the analysis. The mean age of the study population was 57.6 ± 10.8 years, with participants distributed across a broad adult age range. The largest proportion belonged to the 51–60-year age group (39, 32.5%), followed by the 61–70-year group (36, 30.0%). Males constituted 78 (65.0%) participants, while females accounted for 42 (35.0%). The majority of participants were married (103, 85.8%).

The detailed sociodemographic characteristics of the study population are presented in Table 1.

Table 1: Sociodemographic characteristics of study participants

Characteristic	Number (n=120)	Percentage (%)
Age group (years)		
≤ 40	8	6.7
41–50	21	17.5
51–60	39	32.5
61–70	36	30.0
>70	16	13.3
Sex		
Male	78	65.0
Female	42	35.0
Marital status		
Married	103	85.8
Unmarried/widowed/separated	17	14.2

Figure 1 illustrates the age and sex distribution of the study participants.

Figure 1. Distribution of study participants according to age group and sex.

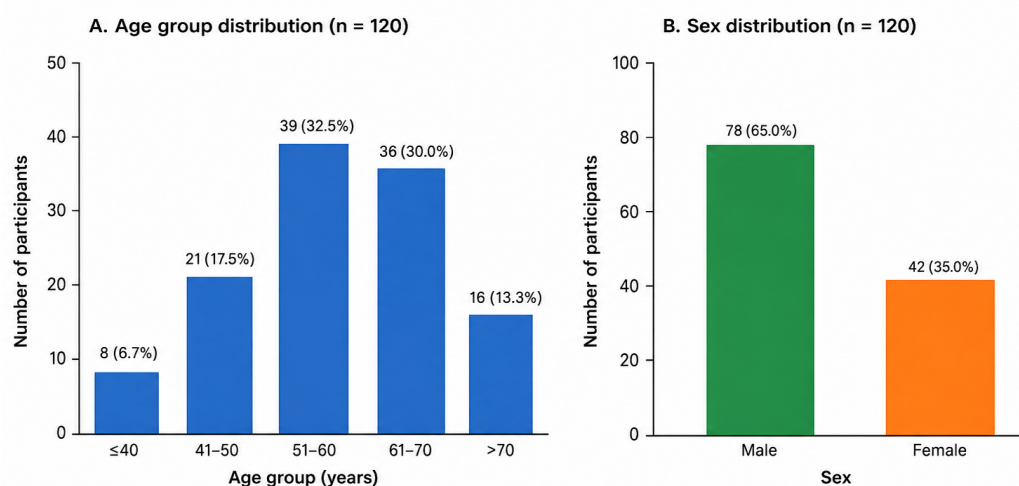


Figure 1: Distribution of study participants according to age group and sex.

Clinical Characteristics: Hypertension was the most frequently documented cardiovascular comorbidity, affecting 73 (60.8%) participants, followed by dyslipidaemia in 67 (55.8%) and diabetes mellitus in 52 (43.3%). A previous history of myocardial infarction was present in 46 (38.3%) participants, while current or recent smoking was

reported in 34 (28.3%). Overall, 81 (67.5%) participants had two or more recognized cardiovascular risk factors.

The clinical characteristics are summarized in Table 2.

Table 2: Clinical characteristics and cardiovascular risk factors among study participants

Clinical characteristic	Number (n=120)	Percentage (%)
Hypertension	73	60.8
Diabetes mellitus	52	43.3
Dyslipidaemia	67	55.8
Current/recent smoking	34	28.3
Previous myocardial infarction	46	38.3
Family history of CHD	39	32.5
≥2 cardiovascular risk factors	81	67.5

Psychological Burden: Assessment using the PHQ-9 demonstrated that 43 (35.8%) participants had depressive symptoms within the moderate-to-severe range, using a PHQ-9 score of ≥10 as the threshold for clinically relevant depressive symptoms. Among the study population, 49 (40.8%) had minimal or no depressive symptoms, 28 (23.3%) had mild symptoms, 23 (19.2%) had moderate symptoms, 14 (11.7%) had moderately severe symptoms, and 6 (5.0%) had severe symptoms.

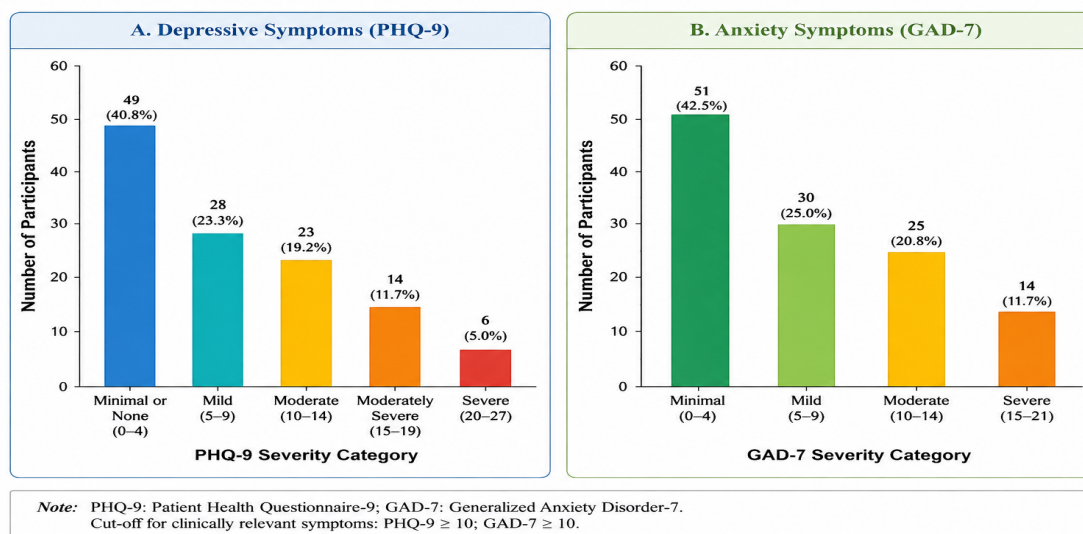
The mean PHQ-9 score was 7.1 ± 5.8 .

GAD-7 assessment identified clinically relevant anxiety symptoms, defined as a score of ≥10, in 39 (32.5%) participants. The mean GAD-7 score was 6.6 ± 5.4 . Minimal anxiety was observed in 51 (42.5%), mild anxiety in 30 (25.0%), moderate anxiety in 25 (20.8%), and severe anxiety in 14 (11.7%) participants.

The distribution of depressive and anxiety symptoms is presented in Table 3, while the overall symptom distribution is illustrated in Figure 2.

Table 3: Distribution of depressive and anxiety symptoms according to PHQ-9 and GAD-7 scores

Psychological assessment	Number (n=120)	Percentage (%)
PHQ-9 category		
Minimal/none (0–4)	49	40.8
Mild (5–9)	28	23.3
Moderate (10–14)	23	19.2
Moderately severe (15–19)	14	11.7
Severe (20–27)	6	5.0
GAD-7 category		
Minimal (0–4)	51	42.5
Mild (5–9)	30	25.0
Moderate (10–14)	25	20.8
Severe (15–21)	14	11.7

Figure 2. Overall distribution of depressive and anxiety symptoms among study participants (n = 120).**Figure 2: Distribution of depressive and anxiety symptom severity according to PHQ-9 and GAD-7 categories.**

Quality of Life: The mean WHOQOL-BREF scores demonstrated variation across the four assessed domains. The highest mean score was observed in the environmental domain, whereas the psychological domain showed comparatively lower scores.

The mean scores were 58.7 ± 11.4 for the physical domain, 55.2 ± 12.1 for the psychological domain, 60.4 ± 13.5 for the social-relationship domain, and

62.1 ± 10.7 for the environmental domain. The overall quality-of-life score was 59.1 ± 9.8 .

Participants without clinically relevant depressive symptoms had higher scores across all WHOQOL-BREF domains compared with those with clinically relevant depressive symptoms. The greatest difference was observed in the psychological domain.

Table 4: WHOQOL-BREF domain scores according to clinically relevant depressive symptoms

WHOQOL-BREF domain	No clinically relevant depression (n=77) Mean $\pm$ SD	Clinically relevant depression (n=43) Mean $\pm$ SD	p-value
Physical	62.4 $\pm$ 9.8	52.1 $\pm$ 10.8	<0.001
Psychological	60.3 $\pm$ 10.2	46.1 $\pm$ 10.4	<0.001
Social relationships	63.4 $\pm$ 11.7	55.0 $\pm$ 14.2	0.001
Environment	65.0 $\pm$ 9.2	56.9 $\pm$ 11.2	<0.001
Overall QoL	62.8 $\pm$ 8.3	52.4 $\pm$ 8.9	<0.001

SD: Standard deviation; QoL: Quality of life.

The comparison of quality-of-life domains according to depressive symptom status is illustrated in Figure 3.

Figure 3. Association of depressive and anxiety symptoms with WHOQOL-BREF domain scores.

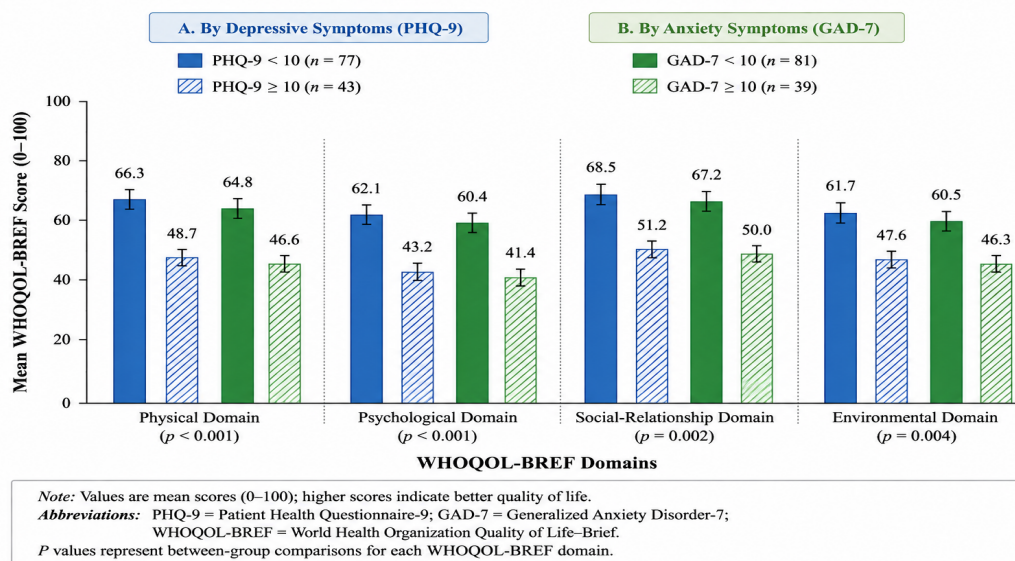


Figure 3: Comparison of mean WHOQOL-BREF domain scores between participants with and without clinically relevant depressive symptoms.

Quality of Life According to Anxiety Status: Participants with clinically relevant anxiety symptoms also demonstrated lower quality-of-life scores across the assessed domains. The

psychological domain showed the greatest difference between participants with and without clinically relevant anxiety.

Table 5: WHOQOL-BREF domain scores according to clinically relevant anxiety

WHOQOL-BREF domain	No clinically relevant anxiety (n=81) Mean ± SD	Clinically relevant anxiety (n=39) Mean ± SD	p-value
Physical	61.4 ± 10.2	53.0 ± 11.0	<0.001
Psychological	59.6 ± 10.5	46.1 ± 10.2	<0.001
Social relationships	63.1 ± 12.5	54.8 ± 14.1	0.001
Environment	64.0 ± 10.1	58.2 ± 10.9	0.004
Overall QoL	62.1 ± 8.8	52.9 ± 8.7	<0.001

Coping Patterns: The Brief COPE assessment demonstrated variation in the coping responses used by participants. Among adaptive coping strategies, acceptance, active coping, planning, and positive reframing were frequently reported. Appropriate use of emotional and instrumental support was also observed in a substantial proportion of participants.

Among potentially maladaptive responses, self-blame, behavioural disengagement, denial, and substance-related coping were observed. Participants with clinically relevant depressive or anxiety symptoms demonstrated greater reliance on maladaptive coping responses than participants without clinically relevant psychological symptoms.

Table 6: Predominant coping patterns among study participants

Coping strategy	Participants reporting frequent use, n (%)
Adaptive coping	
Acceptance	79 (65.8)
Active coping	72 (60.0)
Planning	69 (57.5)
Positive reframing	65 (54.2)
Instrumental support	61 (50.8)
Emotional support	58 (48.3)
Potentially maladaptive coping	
Self-blame	39 (32.5)
Behavioural disengagement	31 (25.8)
Denial	27 (22.5)
Substance-related coping	18 (15.0)

Association Between Psychological Burden and Quality of Life: A significant inverse correlation was observed between PHQ-9 scores and overall quality-of-life scores ($r = -0.62$, $p < 0.001$), indicating that increasing depressive symptom severity was associated with poorer perceived quality of life.

Similarly, GAD-7 scores demonstrated a significant inverse correlation with overall quality of life ($r =$

-0.55 , $p < 0.001$). Among individual WHOQOL-BREF domains, the strongest inverse relationships were observed between PHQ-9 scores and the psychological domain ($r = -0.65$, $p < 0.001$) and between GAD-7 scores and the psychological domain ($r = -0.59$, $p < 0.001$).

The correlation matrix demonstrating the relationships among psychological symptoms and quality-of-life domains is presented in Table 7.

Table 7: Correlation of PHQ-9 and GAD-7 scores with quality-of-life domains

Variable	PHQ-9 r	p-value	GAD-7 r	p-value
Physical domain	-0.53	<0.001	-0.47	<0.001
Psychological domain	-0.65	<0.001	-0.59	<0.001
Social relationships	-0.42	<0.001	-0.39	<0.001
Environment	-0.37	<0.001	-0.34	<0.001
Overall QoL	-0.62	<0.001	-0.55	<0.001

Figure 4 provides a graphical representation of the inverse relationship between psychological symptom severity and overall quality of life.

Figure 4. Correlation of psychological symptoms and coping strategies with overall quality of life (WHOQOL-BREF Overall Score).

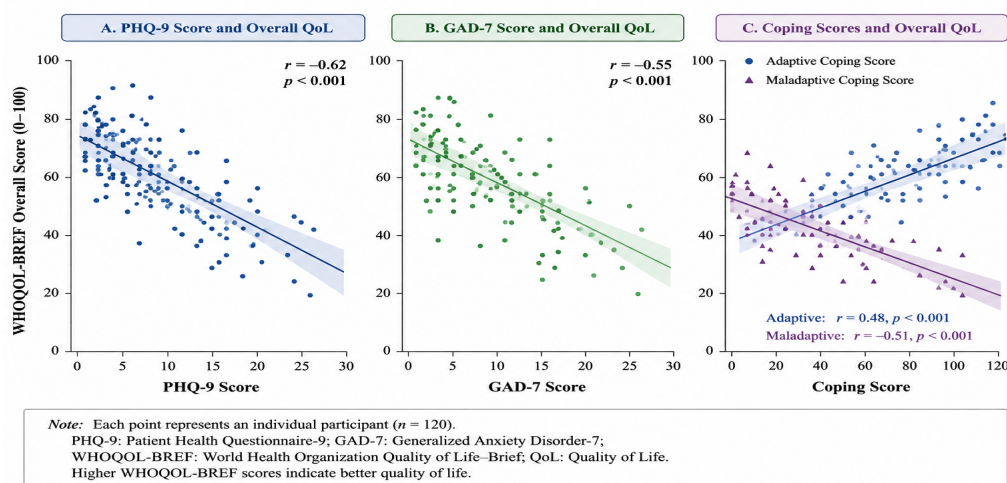


Figure 4: Correlation between psychological symptom severity and overall quality-of-life score.

Relationship Between Coping Patterns and Quality of Life: Adaptive coping was positively associated with overall quality of life ($r = 0.48$, $p < 0.001$), whereas maladaptive coping demonstrated a significant inverse association with overall quality of life ($r = -0.51$, $p < 0.001$).

Participants with higher adaptive coping scores had better psychological and social quality-of-life scores. In contrast, greater reliance on maladaptive coping was associated with higher PHQ-9 and GAD-7 scores.

Table 8: Correlation of coping patterns with psychological burden and quality of life

Variable	Adaptive coping r	p-value	Maladaptive coping r	p-value
PHQ-9 score	-0.43	<0.001	0.49	<0.001
GAD-7 score	-0.38	<0.001	0.45	<0.001
Overall QoL	0.48	<0.001	-0.51	<0.001
Psychological QoL domain	0.51	<0.001	-0.54	<0.001
Social QoL domain	0.39	<0.001	-0.42	<0.001

Factors Associated with Poorer Quality of Life: A multivariable linear regression model was used

to identify independent factors associated with overall quality of life. After adjustment for relevant

demographic and clinical variables, higher PHQ-9 score, higher GAD-7 score, and greater maladaptive coping were independently associated with lower overall quality-of-life scores. Higher adaptive coping scores were independently associated with better quality of life.

The final model explained approximately 55.4% of the variance in overall quality-of-life scores (adjusted $R^2 = 0.554$, $p < 0.001$).

Table 9: Multivariable linear regression analysis of factors associated with overall quality of life

Predictor	β coefficient	Standard error	95% CI	p-value
Age	-0.09	0.04	-0.17 to -0.01	0.028
Male sex	0.07	0.62	-0.15 to 2.32	0.084
Duration of CHD	-0.12	0.05	-0.22 to -0.02	0.019
PHQ-9 score	-0.41	0.19	-0.78 to -0.04	<0.001
GAD-7 score	-0.28	0.20	-0.67 to -0.06	0.010
Adaptive coping score	0.24	0.10	0.05 to 0.43	0.014
Maladaptive coping score	-0.31	0.11	-0.53 to -0.09	0.006

Model statistics: $R^2 = 0.578$; adjusted $R^2 = 0.554$; $p < 0.001$.

Overall, the findings demonstrate that greater depressive and anxiety symptom severity and increased reliance on maladaptive coping were associated with poorer quality of life, whereas adaptive coping was associated with more favourable quality-of-life outcomes.

Discussion

The present study evaluated psychological burden, quality of life, and coping patterns among 120 patients with established CHD. The findings indicate that psychological distress represents an important component of the overall burden of coronary disease. Clinically relevant depressive and anxiety symptoms were identified in a considerable proportion of participants, and greater psychological symptom severity was associated with poorer quality-of-life measures.

The observed relationship between depression and quality of life is consistent with previous evidence. Dickens et al. reported that depression affected approximately one-fifth of individuals with CHD and was associated with poorer health-related quality of life. Their systematic review identified a significant association between depression and subsequent physical quality of life in the majority of the prospective studies evaluated. [9] The present findings similarly suggest that depressive symptoms may substantially influence how patients perceive their physical and psychological health.

The association between psychological distress and quality of life is clinically meaningful because cardiovascular disease may impose restrictions on physical activity, employment, social participation, and daily functioning. Patients who additionally experience depression may have reduced motivation and greater difficulty adapting to these restrictions. Thus, psychological symptoms may amplify the functional consequences of CHD even when cardiovascular disease is clinically stable.

Anxiety was also associated with poorer quality of life in the present study. This finding is compatible with previous literature demonstrating that anxiety is common among individuals with CHD and may be associated with adverse cardiovascular outcomes. [8] Anxiety may arise from concerns about recurrent cardiac events, uncertainty regarding prognosis, physical symptoms, or limitations in daily activities. Persistent health-related worry may consequently influence patients' perceptions of physical and psychological well-being.

The present findings are also consistent with evidence demonstrating that psychosocial characteristics are important determinants of health-related quality of life after coronary disease. A critical review identified depression, anxiety, mood disturbance, social support, clinical symptoms, and demographic characteristics among the factors associated with quality-of-life outcomes in patients with coronary disease. [10] This supports the concept that quality of life in CHD is multidimensional and cannot be explained solely by cardiovascular disease severity.

An important aspect of the present study was the assessment of coping patterns. Participants demonstrating adaptive responses such as active coping, acceptance, planning, and positive reframing generally had more favourable quality-of-life measures. This observation is consistent with the broader concept that coping behaviour can influence psychological adjustment to chronic illness. Van Elderen et al. specifically examined coping among patients with CHD and demonstrated the relevance of coping strategies to anxiety, depression, and well-being. [15]

Conversely, maladaptive coping responses, including behavioural disengagement and self-blame, were associated with greater psychological burden in the present study. Such strategies may reduce active engagement with disease

management and reinforce negative perceptions of illness. The use of substance-related coping may be particularly problematic because it can simultaneously compromise psychological well-being and cardiovascular risk-factor control.

Social support also represents an important component of adaptation to CHD. Previous reviews have identified social support as a relevant psychosocial factor in the development and prognosis of coronary disease. [2] Social support may help patients manage treatment requirements, maintain motivation for lifestyle modification, and deal with emotional distress. The relationship between depression and social support has also been considered in psychosocial intervention research involving patients with CHD. [16]

The clinical importance of identifying psychological symptoms extends beyond symptom recognition. Evidence from systematic reviews suggests that psychosocial interventions can reduce depressive symptoms and improve social support among patients with CHD and depression. [16] More recent evidence from a Cochrane systematic review and meta-analysis indicates that psychological interventions can reduce depression and anxiety and improve mental health-related quality of life in patients with cardiovascular disease, although the magnitude of benefit varies across interventions and studies. [17]

Similarly, recent evidence examining interventions in CHD has shown that approaches targeting psychological health can improve quality of life while reducing anxiety and depressive symptoms. A 2024 meta-analysis of randomized controlled trials found that mHealth interventions were associated with improvements in quality of life and reductions in anxiety and depression among patients with CHD. [18] These findings reinforce the potential value of integrating psychological support into long-term cardiovascular management.

The present study therefore supports a patient-centred approach in which psychological assessment is incorporated alongside conventional cardiovascular evaluation. Screening instruments such as the PHQ-9 and GAD-7 can provide a practical method for identifying patients who may require more detailed psychological assessment. [12, 13] However, questionnaire scores should be interpreted as indicators of symptom burden rather than substitutes for comprehensive psychiatric diagnosis.

The findings also have implications for cardiac rehabilitation. Conventional rehabilitation programmes emphasize physical activity, cardiovascular risk-factor modification, and education, but psychological health and coping may also influence participation and long-term

adherence. Addressing maladaptive coping and strengthening constructive responses may improve patients' ability to manage the continuing demands of chronic cardiovascular disease.

An important strength of the present study is its simultaneous evaluation of psychological symptoms, quality of life, and coping patterns. Rather than considering depression or anxiety in isolation, the study examines these factors as interconnected components of adaptation to CHD. This approach may provide a more clinically meaningful picture of the patient's overall psychosocial experience.

Nevertheless, several limitations should be considered. First, the cross-sectional design prevents determination of temporal or causal relationships. Although depression and anxiety were associated with poorer quality of life, the direction of these relationships cannot be established. Second, psychological symptoms and coping were assessed using self-report instruments and may therefore be influenced by response and recall bias. Third, the study was conducted at a single tertiary-care institution, which may limit generalizability to other populations and healthcare settings. Finally, longitudinal assessment would be required to determine whether changes in coping patterns are followed by improvements in psychological symptoms and quality of life.

Future prospective studies should evaluate patients over longer periods and examine whether targeted psychological and coping interventions can improve quality of life, treatment adherence, and cardiovascular outcomes. Interventional studies involving multidisciplinary cardiac rehabilitation programmes may be particularly valuable.

Overall, the findings support the view that psychological health and coping should be considered integral components of comprehensive CHD management. Depression, anxiety, quality of life, and coping are interconnected domains that may influence the patient's experience of chronic cardiovascular illness and should receive appropriate clinical attention.

Conclusion

The study demonstrates that patients living with coronary heart disease may experience a considerable psychological burden, with depressive and anxiety symptoms occurring alongside impaired quality of life. Psychological symptom severity was associated with poorer perceived physical, psychological, and social well-being.

Coping responses appeared to play an important role in adaptation to chronic cardiovascular illness. Active coping, acceptance, planning, and positive reframing were associated with more favourable

outcomes, whereas maladaptive responses were associated with greater psychological distress.

Assessment of psychological health and coping patterns should therefore form part of a comprehensive approach to CHD management. Recognizing psychological difficulties early may allow appropriate supportive interventions and potentially improve patients' overall experience of living with coronary heart disease.

Recommendation

Routine cardiovascular follow-up should incorporate brief assessment of depression and anxiety, particularly among patients reporting persistent distress, reduced functioning, poor treatment adherence, or deterioration in perceived quality of life.

Patients identified with significant psychological symptoms should be considered for appropriate psychological counselling or specialist mental-health assessment. Cardiac rehabilitation and patient-education programmes should also incorporate coping-focused strategies, stress management, social support, and encouragement of adaptive behavioural responses.

A multidisciplinary model involving cardiologists, physicians, mental-health professionals, nurses, rehabilitation specialists, and other relevant healthcare providers may provide more comprehensive care for patients experiencing both cardiovascular and psychological challenges.

Future longitudinal studies should evaluate whether structured psychological and coping interventions can improve quality of life, treatment adherence, and cardiovascular outcomes over time.

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List of Abbreviations

CHD – Coronary Heart Disease

PHQ-9 – Patient Health Questionnaire-9

GAD-7 – Generalized Anxiety Disorder-7

WHOQOL-BREF – World Health Organization Quality of Life-BREF

COPE – Coping Orientation to Problems Experienced

QoL – Quality of Life

MI – Myocardial Infarction

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