P-ISSN: 2790-6795	Annals of Human and Social Sciences	May-June 2026,Vol. 7, No.3
O-ISSN:2790-6809	http://doi.org/10.35484/ahss.2026(7-III)12	[105-113]

Annals of Human and Social Sciences
www.ahss.org.pk

RESEARCH PAPER

Personality Matters: Investigating the Intersection of Personality and Quality of Life in Patients of Coronary Artery Disease (CAD)

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ABSTRACT

Coronary Artery Disease (CAD), a condition characterized by narrowing or blockage of the coronary arteries, which supply blood and oxygen to the heart muscle. This disease is a major cause of morbidity and mortality worldwide. CAD also associated with mental health issues. The aim of this research is to investigate the link between patients' quality of life and D-type personality in those who have coronary artery disease (CAD). A qualitative correlational research design was employed to collect the data. A total of 210 patients (men=127 & women=83) with coronary artery disease selected through purposive sampling. The study utilized standardized Urdu versions of Type D Scale-14 (Denollet, 2005) and the World Health Organization Quality of Life Scale brief form (WHO, 1996) to measure personality and quality of life. Findings indicated that Quality of life is correlated with facets of the type-D personality, with its subscales social inhibition and negative affectivity. Regression analysis revealed that gender, social inhibition (SI), and negative affectivity (NA) all adversely predicted quality of life and collectively accounted for 39% of the variance. Mean differences were observed in gender, where women scored more on Type-D personality, Negative Affectivity, and Social Inhibition, while men scored higher on Quality of Life. The study outcomes provided valuable insights into the psychological factors affecting coronary artery disease patients' quality of life. The research findings could aid in the development of preventative measures and methods for promoting mental health, which would help vulnerable people, avoid developing mental health problems in the first place as well as manage current psychological challenges.

Keywords: Type-D personality, Quality of Life, Coronary Artery Disease (CAD)

Introduction

Coronary Artery Disease (CAD) is a major cause of death worldwide, placing a significant burden on both the public health system and individuals. The prevalence of CAD is 244.1 million worldwide, with a higher incidence rate in men than in women (141.0 and 103.1 million persons, respectively) (Tsao etal., 2022). Atherosclerotic plaques gradually accumulate inside the coronary arteries, causing CAD. This impairs blood supply to the heart muscle and causes myocardial ischemia and infarction. The clinical manifestations of CAD range from stable angina to acute coronary syndromes, which include myocardial infarction and abrupt cardiac death (De-Hert, 2018). The growing risk of CAD is further aggravated by contributing factors like smoking, diabetes, hypertension, obesity, raised cholesterol, and the devastating impact of psychological distress and type-D personality (TDP) (Williams etal., 2020).

Psychological risk factors related to coronary artery disease include depression, anxiety, stress, negative affectivity, social inhibition, social isolation, lack of social support, mood dysregulation, and traumatic life events. The studies reported that by improving the

quality of life and psychological support, heart patients would better manage psychological distress and health issues (Kim etal., 2019).

It has been observed that heart patients often undergo mental breakdowns and emotional turmoil after being diagnosed or continuous treatment for chronic disease. Recent literature shed light on type-D personality as a risk factor for the development of CAD. The type D personality, considered a tendency towards negative affectivity and social inhibition, has appeared as a potential contributor to the development and progression of CAD (Lodder etal., 2023). Since the introduction of the notion of type-D personality in 1999, mainly in the context of cancer research, its significance in relation to coronary artery disease has grown. Since 2012, the European Cardiovascular Prevention recommendations have identified type-D personality as a risk factor to be screened for (Kupper & Denollet, 2018). Individuals with a type-D personality frequently exhibit high levels of psychological distress, including emotional dysregulation, interpersonal communication issues, aggression, anxiety, and despair. Such emotional suppression and social withdrawal may create a chronic state of distress in body which leads towards the dysregulation of physiological processes implicated in coronary pathogenesis. Numerous researches suggested that individuals with D-type personality may be at a high risk of developing coronary heart disease, experiencing more severe presentation of disease, exhibiting poorer prognosis compared to the non-type-D personality individuals (Sumin & Shcheglova, 2023). Still the mechanism through which the type-D personality traits influence CAD is unclear and the potential association with other psychological variables such quality of life is still need to examine in Pakistan.

Quality of life (QOL) is defined as the measure of how much a medical disease or its treatment impacts a person's usual or expected social, emotional, and physical well-being. It is a person’s subjective perceptions of where they are in life after taking into account the values and cultures around them. The concept of quality of life is complex and encompasses different facets of one's social, mental, and physical health. Individuals who have undergone a cardiac event may encounter a decrease in their quality of life due to physical limitations, anxiety, and depression

(Megari, 2013). A person's quality of life can be greatly impacted by physical functional limits caused on by CAD, which frequently result in decreased exercise tolerance, dyspnea, and exhaustion. According to research, people with CAD report worse levels of general physical well-being and a reduction in their ability to function physically as compared to people without CAD. Daily activities may be impacted by the symptoms and functional limits of CAD, which can lower quality of life in this area (Rumsfeld etal., 2003). Furthermore, after a cardiac incident, an individual's quality of life may be impacted by psychological variables. Reduced physical activity and a lower quality of life are associated with type D personalities (Bahall etal., 2020). People with a Type D personality have a negative impact on heart patients' Quality of Life (QOL). Specifically, the social inhibition component contributes more to lower QOL than negative affectivity does (Kupper & Denollet, 2018).

Literature Review

Type D personality has emerged as significant psychosocial risk factor in coronary artery disease. Individuals with this personality type tend to experience persistent negative emotions while simultaneously inhibiting emotional expression in social interactions. Recent research by Frojd et al. (2023) investigated predictors of health-related quality of life among out patients with coronary heart disease and found that Type D personality was significantly associated with lower quality of life. The authors reported that depressive symptoms, anxiety, insomnia and type D personality jointly contributed to poorer physical and mental well-being, highlighting the importance of psychosocial assessment in cardiac rehabilitation programs. Another study examine the role of type D personality in recurrent

cardiovascular disease among CAD patients. The study reaffirms that type D personality is linked with adverse psychological functioning and reduced quality of life, emphasizing its relevance as a psychosocial risk modifier in contemporary cardiovascular care. Sabah etal. (2023) investigated Type D personality among patients who underwent primary percutaneous coronary intervention following myocardial infraction. Research reported that Type D personality was associated with adverse cardiac outcome and poorer psychosocial adjustment. A systematic review of meta-analysis by Bae and Park (2019) synthesized findings from 31 studies and concluded that CAD patients with Type personality experienced significantly lower physical and mental quality of life compared with non-type D patients.

In Pakistan, there is an emphasis on the medical facets of coronary artery disease, with minimal attention given to the psychosocial factors associated with life-threatening conditions like coronary artery disease and their influence on the quality of life for affected patients. As D type personality has been identified as a growing risk factor for heart disease and future cardiac events, research focusing on the construct of Type D personality would be valuable in identifying and understanding heart disease patients. This is why the main reason of present study was to examine how type-D personality affects coronary artery disease (CAD) patients' quality of life. The basis for creating focused clinical therapies for patients with coronary artery disease (CAD) will be established by comprehending the connections between type-D personality and quality of life.

Hypotheses for the current research study were:

H1 There will be a significant correlation between D-type personality and quality of life in patients with coronary artery disease (CAD).

H2 D type personality will be a predictor of quality of life in patients of coronary artery disease (CAD).

H3 There will be significant mean differences in gender in terms of D-type personality and quality of life in patients with coronary artery disease (CAD).

Material and Methods

Participants and Data Collection

The correctional cross-sectional design was followed, and a purposive sampling strategy was utilized to collect the participants. The total sample of (N=210) coronary artery disease was recruited, including men=127 and women 83. The participants met inclusion criteria (Diagnosed patients by heart surgeons, (MBBS, FPCS) patients' ages ranged from 20 to 60 years, educated Middle grade till MPhil, whereas exclusion criteria were any diagnosed mental disorder or disability, severe comorbidities, pregnancy, and participation in any psychotherapy.

Instruments

D-Type Scale (DS14)

Standardized measures were used to collect the responses. The D-Type Scale (DS14), created by Denollet in 2005, was utilized to evaluate social inhibition (SI) and negative affectivity (NA), characterized by the propensity to feel negative emotions and inhibit self-expression in social situations. A two-dimension scale comprised of 7 items, each with a 5-point Likert scale (0 to 4) with a good reliability of 0.86, was administered. The Urdu version of DS-14 was used in the current study.

World Health Organization Quality of Life (WHOQOL-BREF)

A shorter version of the World Health Organization Quality of Life (WHOQOL-BREF) was created in 1994 and translated by the WHO team in 2003. Its goal is to offer a quality of life measurement that is adaptable across cultural boundaries. Participants in the measure indicate their experienced feelings about their health state on a 5-point Likert scale for each of the 26 items. The four categories of the scale are physical health, psychological health, social interactions, and environment.

Procedure and Ethical Considerations

Before implementation of the study, ethical approval was taken from the postgraduate committee (GPC) of the University of Central Punjab, Lahore. Permission was obtained from the hospital authorities and authors of the scales. The aims and objectives of the research were shared with the participants. The participants provided written informed consent, and confidentiality regarding the responses was ensured. All the assessment scales were handed over individually for the data collection purpose. Debriefing was done at the end of the responses.

Results and Discussion

Table 1
Demographic Properties of the Sample (N = 210)

Demographics	Frequencies (n)	Percentage (%)
Age		
20-30	59	28.1
31-40	56	26.7
41-50	27	12.9
51-60	68	32.4
Gender		
Male	127	60.5
Female	83	39.5
Marital status		
Unmarried	26	12.4
Married	184	87.6
Education		
Middle	19	9.0
Matric	121	57.6
FA/FSC	37	17.6
Graduation	20	9.5
MPhil	13	6.2
Employment status		
Employed	123	58.6
Unemployed	87	41.4
Residential area		
Urban	174	82.9
Rural	36	17.1
Duration of Disease		
0-6 months	58	27.6
6 months-1 year	73	34.8
1.1 years- 2 years	55	26.2
2.1 years-above	24	11.4

Table 2
Psychometric Properties for the Scales & Subscales (N=210)

Scale	k	M	SD	Range	Cronbach's α
DS14	14	26.55	16.2	4-54	.93
NA	7	12.7	7.4	1-27	.82
SI	7	13.8	9.37	1-28	.91
Quality of Life	26	94.0	12.64	43.69-85	.90
Physical	7	24.6	3.61	9.71-18.8	.71
Psychological	6	22.0	3.47	9.33-20	.72
Social	3	11.2	1.74	6.67-18.6	.41
Environmental	8	29.0	4.45	9.50-18.5	.78

Note: *k*= total number of items, *M*= mean, *SD*=Standard deviation, *NA*=Negative Affectivity, *SI*=Social Inhibition, *PF*=Problem Focused, *EF*=Emotional Focused

According to Table 2, reliability coefficients are within the acceptable range. It also shows the mean and standard deviation of the scales with the total number of items.

Table 3
Correlation of Study Variables (210)

Sr.no	Variables	1	2	3	4	5	6	7	8
1	NA	-							
2	SI	.89**	-						
3	DS14	.95**	.97**	-					
4	PHY	-.48**	-.46**	-.44**	-				
5	PSY	-.48**	-.48**	-.49**	.64**	-			
6	SO	-.43**	-.41**	-.43**	.48**	.62**	-		
7	ENV	-.61**	-.61**	-.63**	.61**	.76**	.68**	-	
8	QOL	-.56**	-.59**	-.59**	.80**	.89**	.79**	.89**	-

Note: **Correlation is significant at the 0.01 level(2-tailed)

NA=Negative Affectivity, *SI*=Social Inhibition, *PHY*=Physical, *PSY*=Psychological, *SO*=Social, *ENV*=Environmental, *QOL*=Quality of Life

This table shows that there is a strong negative correlation between DS14 and Quality of Life (QOL) ($r = -.59$, $N = 210$, $p < .01$), signifying that individuals with higher Type-D Personality traits tend to report lower quality of life. Likewise the subscales of both variables also exhibit negative association with each other.

Table 4
Hierarchal regression analysis of predicting Quality of life (N=210)

Variables	B	95% class for B		SE	β	R^2	ΔR
		LL	UL				
Model 1						.08	.08
Constant	72.76	69.30	76.23	1.75			
Gender	-5.31	-7.66	-2.97	1.19	-.29		
Model 2						.37	.28
Constant	78.92	75.76	82.09	1.6			
Gender	-4.001	-5.98	-2.02	1.0	-.22		
NA	-.628	-.53	-.03	.066	-.53		
Model 3						.39	.03
Constant	78.4	75.29	81.52	1.58			
Gender	-3.59	-5.54	-1.63	.99	-.20		
NA	-.29	-.53	-.04	.13	-.24		
SI	-.32	-.52	-.12	.10	-.34		

Note: NA=Negative affectivity, SI=Social inhibition

The hierarchical multiple regression reveals that in Model 1, control variables were introduced to assess their impact on the Quality of Life. Gender accounts for 8% (Adjusted R^2=.08) variation in the quality of life, and it is a significant negative predictor of Quality of Life ($\beta = -0.29$, $p < 0.05$). Model 2 explains 38% (Adjusted $R^2 = 0.38$) of the variance in Quality of Life, indicating that the introduction of NA substantially improved the model's ability to predict Quality of Life compared to Model 1. NA is negatively associated with Quality of Life ($\beta = -0.53$, $p < 0.05$). Gender still exhibits a negative association with Quality of Life ($\beta = -0.22$, $p < 0.05$). Introducing SI in Model-3 explains an additional 39% (Adjusted $R^2 = 0.38$) variance in quality of life. SI is also negatively associated with Quality of Life ($\beta = -0.34$, $p < 0.05$), signifying that a one-unit increase in SI corresponds to a 0.34-unit decrease in Quality of Life.

Table 5
Independent sample T test depicting Mean difference among study variables based on gender

Measures	Male		Female		t(208)	p	Cohen's d
	M	SD	M	SD			
NA	11.9	7.35	14.01	7.47	-2.01	.04	-0.29
SI	12.42	9.12	15.95	9.42	-2.71	.007	-0.38
DS14	24.33	15.96	29.91	16.16	-2.46	.01	-0.35
QOL	67.44	8.54	62.12	8.23	4.47	.00	0.64

Note: p <0.05, *M*=Mean, *SD*= Standard Deviation

Results of the t-test suggest that the mean difference between males and females on NA (t= -2.01 $p < 0.05$) is statistically significant. Females (*M*=14.01, *SD*=7.47) have more negative affectivity than males (*M*=11.9, *SD*=7.35). For SI (t= -2.71 $p < 0.01$) and t-test outcomes reveal that females (*M*=15.95, *SD*=9.42) exhibit more social inhibition as compared to the males (*M*=12.42, *SD*=9.12). Results show the statistically significant mean difference between males and females on DS-14 (t= -2.46 $p < 0.05$). Females (*M*=29.91, *SD*=16.16) have more type-D personality traits than males (*M*=24.33, *SD*=15.96). For QOL (t= 4.47 $p < 0.001$), the t-test outcomes reveal a statistically significant difference in means between males (*M*=67.44, *SD*=8.54) and females (*M*=62.12, *SD*=8.23) in terms of QoL. Male's QoL is better than females.

Discussion

Psychological risk factors such as Type D personality traits have emerged as vital determinants of health-related consequences in CAD patients (Zhang etal., 2023). The present study examined the varying impact of D-type personality on the quality of life in individuals with coronary artery disease. The psychometric properties of the scales employed in this study are essential for assuring the reliability and validity of the collected data. Table 2 presents a summary of the reliability coefficients that are within the recommended range.

The correlation reveals a significant negative association between D-type personality and overall quality of life and its sub-dimensions (Negative Affectivity and Social Inhibitions). This suggests that individuals with D-type personalities may experience emotions and reduced social functioning to non-type D personalities. Furthermore, the latest studies have highlighted NA and SI's independent significant negative contribution to QoL in CAD patients(Chen etal., 2020). The social inhibition component, specifically, exerts a more pronounced influence on contributing to low QOL compared to negative affectivity (Kupper & Denollet, 2018).

Regression analysis was run in which control variables were introduced to assess their impact on Quality of Life. In model 1 Gender exhibited a significant negative correlation with Quality of Life. These findings align with existing research indicating that gender can

significantly impact the quality of life in CAD patients (Wlodarczyk & Zietalewicz, 2020). Another research supports these results, indicating that variations in the progression of Health-Related Quality of Life (HRQL) are observed between males and females following a heart attack. Mental well-being consistently emerges as the primary factor linked to HRQL in both male and female populations (Kenny etal., 2023). In Model 2 and 3, NA and SI were also found to have negative associations with Quality of Life, suggesting that an increase in these variables corresponded to decreased Quality of Life. These outcomes are consistent with previous research, suggesting that higher scores on Type-D personality are linked to a negative impact on the quality of life (Zhang etal., 2023). Another study, which typically suggests that psychological factors play a more significant role in predicting cardiovascular outcomes in individuals without preexisting health conditions compared to those with existing illnesses, indicates that type-D personality has a negative association with HQoL (Kelsey etal., 2022).

Independent sample t-tests assess the differences in means between various groups for the measures DS-14, and Quality of Life. The t-tests comparing Gender differences indicate a significant difference between males and females for NA, SI DS-14, where female's exhibit higher scores than males. This might be because of sociocultural factors and gender roles because traditional gender norms often place greater emphasis on emotional expression and interpersonal relationships for females, which may contribute to heightened levels of NA and SI. Women may feel stress and pressure to conform to societal expectations of nurturing, empathy, and politeness, leading to a greater internalization of negative emotions and inhibition of self-expression and social settings. Previous research has reported gender disparities in psychological outcomes in CAD patients, with females often experiencing more psychological distress as compared with males (Williams etal., 2019). Despite both genders experiencing CAD, females tend to report poor QoL than males. This aligns with studies that have found gender differences in quality of life, with females often reporting poorer outcomes (King etal., 2022). Several factors may contribute to the observed gender difference in QoL, such as hormonal fluctuation, caregiving responsibilities, perception and experience of CAD symptoms in different ways and cultural norms

Conclusion

The findings showed that QoL is negatively correlated with Type-D personality, and females suffer more as compared with males. The study gave emphases to provide psychological help to the patients with CAD.

Implications

The implications of these results are significant for clinical practice. Health care providers need to be attentive to the psychological needs of CAD patients and especially females. Tailored interventions focusing on emotional support, stress management, and coping strategies may help mitigate the negative impact of Type D personality and improve quality of life.

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