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Original Research Article

A STUDY ON ASSESSMENT OF ANXIETY IN CARDIOVASCULAR DISEASE PATIENTS

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Abstract: *To assess anxiety levels in cardiovascular disease patients and examine the impact of demographic variables. To study the level of anxiety in cardiovascular disease (CVD) patients and examine the impact of demographic variables, a comparative study design was used. To compare the anxiety level among CVD patients and non-CVD participants, the sample size was 200 (100 CVD patients and 100 non-CVD participants), and a random sampling technique was used. To study the impact of demographic variables on CVD patients, 100 randomly selected CVD patients (50 male and 50 female) were registered. The Depression, Anxiety, and Stress Scale (DASS-42) was used to assess the level of depression of the study participants. Cardiovascular disease patients recorded significantly higher anxiety levels than the control group (participants without CVD). The impact of demographic variables such as gender, age, education, and socio-economic status also revealed significant differences in anxiety levels among CVD patients. Female, less educated, elderly, and low socio-economic status CVD patients reported higher anxiety scores on DASS-42. The findings of the study revealed that anxiety is a psychological risk factor for CVD patients. Females, less educated, elderly, and with low socio-economic status CVD patients were more affected. Understanding the complex relationship between mental health issues like depression and cardiovascular disease and the impact of gender, education, age, and socio-economic status on anxiety level has not been researched extensively. Further studies are needed to understand the complexity of these interrelationships.*

Keywords: Anxiety, Cardiovascular Disease, Gender, Age, Education, and Socio-Economic Status

Introduction

Anxiety disorders are widespread in people with CVD and may have a major impact on cardiac health. Anxiety disorders have been linked to the beginning and progression of heart illness, as well as unfavorable cardiovascular outcomes, including mortality. Anxiety is widespread in cardiovascular disease patients, such as those with coronary artery disease (CAD). Anxiety appears to be common in patients with CAD, and its deleterious impact on cardiovascular, physical, and psychological outcomes in this population is becoming more widely acknowledged. However, the research on this topic is still limited, and the accessible studies have significant methodological faults (Foldes-Busque et al., 2021).

Cardiovascular disease is also the leading cause of mortality among Europeans, surpassing all other conditions. In several countries, it continues to be responsible for over twice as many fatalities as cancer. In the majority of nations with available data, mortality and case-fatality rates associated with coronary heart disease (CHD) and stroke have decreased significantly, albeit at varying rates, over the past 5–10 years. Due to divergent recent trends, there have been growing disparities in the burden of cardiovascular disease (CVD) among nations (Nichols et al., 2014). Anxiety disorders are prevalent, and their effects on cardiac health, functioning, and quality of life are long-lasting. Anxiety disorders are chronic and predictive of adverse functional and cardiac outcomes among patients with cardiovascular disease. (Celano et al., 2016). Anxiety, particularly the experience of feeling worried, is a distinct risk factor for cardiovascular disease (CVD) events among older persons, irrespective of conventional risk factors and depression. The significance of anxiety concerning cardiovascular disease (CVD) risk stratification and its potential as a target for primary preventive efforts should be given greater consideration (Stewart et al., 2016). There has been an increased emphasis on investigating the correlation between anxiety and the onset of cardiovascular disease (CVD) (Batelaan et al., 2016; Tully et al., 2017).

The prevention of cardiovascular disease (CVD) refers to a systematic and organized series of measures, implemented at either a population-wide level or tailored to specific individuals, to eradicate or reduce the consequences of CVD and its associated impairments. The cost-effectiveness of preventing cardiovascular disease (CVD) is evident in various scenarios, such as adopting lifestyle modifications or using medication. This holds for population-wide strategies and interventions targeted at high-risk individuals. Globally, cardiovascular diseases (CVDs) constitute the primary cause of mortality. There is an increasing international focus on comprehending and mitigating modifiable psychosocial risk factors, specifically anxiety and depression, to avert cardiovascular diseases and decrease overall morbidity and mortality (Ivanovs et al., 2018). A substantial body of scientific evidence strongly supports the concept that psychological factors impact overall health, with a specific focus on cardio-metabolic pathways. Therefore, it is imperative to acknowledge and consider the intricate interplay between psychology and health. Within this particular context, it is evident that cardiac rehabilitation presents an opportune moment for addressing psychological illnesses among individuals with

heart disease. This intervention can potentially mitigate the adverse consequences associated with such disorders (Chauvet-Gelinier & Bonin, 2017).

Anxiety disorders comprise the most prevalent subset of psychiatric conditions on a global scale. Anxiety is a risk for CVD patients and requires special care and management *(Pérez-Piñar et al., 2016).* An association was observed in CHD outpatients between GAD and cardiovascular events, which was not highlighted by biological mediators, the severity of the condition, and health-related behaviors. More research is necessary to determine how GAD contributes to poor cardiovascular outcomes (Martens et al., 2010). Cardiovascular disease continues to be the leading cause of mortality in Europe, accounting for nearly twice as many fatalities as cancer. While it is evident from available statistics that the mortality rate from stroke and coronary heart disease has significantly declined over the past five to ten years, there are still significant differences in mortality rates between European nations, both in terms of the present rates of death and the rate at which these declines have happened (Townsend et al., 2015). Anxiety is linked to new cardiovascular events and mortality on a short-term basis, but other chronic disease factors are more significant in chronic illness, as noted twelve years later.

Furthermore, the findings reported that elevated anxiety levels decreased over time, but there was no association between all-cause mortality and anxiety in low anxiety patients. Future research on anxiety after major adverse cardiac events is needed for both short and long-term (Deter et al., 2023). Another study compared the prevalence of anxiety between patients who consulted online and offline and analyzed the factors related to anxiety. The findings of the study suggested that anxiety was more prevalent in women (Li et al., 2023). Anxiety and depression symptoms were reported in more than 50% of CHF patients. Based on these findings, CHF patients should undergo mental health screening, with appropriate referral paths to psychologists and psychiatrists. We recommend that prospective, multicenter studies in low- and middle-income countries use various measures to screen for depression, anxiety, and stress and explore their impact on CHF outcomes (Tsabedze et al., 2021). There is conflicting evidence about anxiety as an independent risk predictor for both incidental and recurring CVD.

To explicate this, future research should be demographic-specific, measurement-specific, and result-specific. The findings indicate that, despite their co-morbidity, anxiety may be considered an independent risk marker of CVD. As a result, international CVD preventive guidelines should be amended accordingly. Furthermore, when addressing mental health to lower the risk of CVD, treating depression should take precedence (Karlsen et al., 2021). Anxiety has been linked to new-onset cardiovascular disease (CVD), but the strength of this association is clear. However, if anxiety is a causal, independent risk factor for CVD, it may be a focus for CVD prevention. Future studies should look into the molecular and behavioral basis of the connection to discover intervention targets (Batelaan et al., 2016). Heart-focused anxiety is connected with anxiety and depressive symptoms in patients with heart failure. These patients are more prone to seek medical assistance and specialized services, but the need for psychological assistance is rarely identified (Pokrajac-Bulian. et al., 2022). Different studies spanning over six decades have provided empirical evidence indicating that psychosocial risk factors, such as low socio-economic status, inadequate social support, work and family-related stress, depression, anxiety, and hostility, play a significant role in the susceptibility to coronary heart disease (CHD) development.

Furthermore, these risk factors have been found to exacerbate the clinical course and prognosis of individuals already diagnosed with CHD. Several variables can hinder treatment adherence and impede efforts to enhance lifestyle among patients and groups (Albus, 2010*).* Elevated levels of anxiety or depression, along with psychophysiological dysregulation, appear to be the most pertinent factors in both prevention and treatment. These factors have a noteworthy influence on the morbidity and death rates of both anxious and CVD patients (Chalmers et al., 2014).

In recent times, extensive prospective epidemiologic research with smaller-scale fundamental science investigations have effectively demonstrated a significant association between cardiovascular disease (CVD) and several psychological illnesses. These conditions encompass depression, chronic psychological stress, post-traumatic stress disorder (PTSD), and anxiety (Cohen et al., 2015). According to a study comparing the risk factors for cardiovascular disease (CVD) among men and women, as noted in primary healthcare services, women were less likely than men to have their risk variables quantified and documented to determine their absolute risk of developing CVD (Hyun et al., 2019). The presence of anxiety appeared to be a distinct and autonomous factor that increased the likelihood of developing coronary heart disease (CHD) and experiencing cardiac-related death. Further investigation is warranted to explore the correlation between anxiety and coronary heart disease (CHD) using anxiety measures that are both accurate and reliable.

Additionally, future research should emphasize elucidating the mechanisms by which anxiety potentially influences the development and progression of CHD (Roest et al., 2010). According to the prevailing guidelines for cardiovascular disease (CVD) prevention, it is recommended to conduct screenings for anxiety and depression concurrently to identify individuals who are at the highest risk *(*Piepoli et al., 2016). It is necessary to assess the CVD problem in young adults and identify modifiable risk factors that contribute to the reported rising prevalence of CVDs in this demographic *(Piepoli et al., 2019).*

The present research has been planned to assess and compare anxiety levels in CVD and non-CVD patients. Patients with CVD manifest psychological symptoms of anxiety and the level of anxiety is higher than the normal population. Furthermore, the impact of demographic variables, gender, age, education, and socio-economic status on CVD patients was examined. Thus, the aims of this study are twofold. Firstly, to evaluate the anxiety levels in individuals suffering from cardiovascular disease (CVD) and compare it with those without CVD. Secondly, to investigate the influence of gender, age, education, and socio-economic status on anxiety levels in CVD patients.

Methodology

A comparative study was conducted to test the hypothesis of the research. The study population consisted of patients with Cardiovascular Disease (CVD) and those without CVD. The sample for the study included 200 participants,

100 males, and 100 females, randomly recruited from two hospitals in 2023. The study aimed to compare the level of anxiety between CVD and non-CVD participants. The data of only 100 CVD patients (n = 100) was analyzed to examine the impact of demographic variables on CVD. The participants were divided into two age groups, younger adults (40-50) and older adults (51-65), with diverse socio-economic backgrounds. The education level was classified into three groups: matric, graduate, and postgraduate, and the participants were also divided into low, middle, and high socio-economic status groups. The software G*Power version 3.1.9.7 estimated the sample size at a 5% level of significance with a power of 80% to detect a difference of 0.30 and 20 for comparative and interventional studies, respectively.

Inclusion criteria for the study included males and females with a definite diagnosis of cardiovascular disease (CVD) from the outpatient department (OPD), patients within two months after diagnosing CVD, and males and females between 40-65 years of age. Male smoker CVD patients between the age of 40-65 years were included in the smoking cessation study. Exclusion criteria consisted of patients below 40 or above 65 years of age, patients with severe mental disorders, unstable heart conditions, participants on psychotropic drugs, severe lung disease, comorbid serious conditions (e.g., Cancer or AIDS), dementia and Alzheimer's disease, or severe cognitive impairments.

The Depression, Anxiety, and Stress Scale (DASS-42) was used to collect data for the study, which is a reliable and valid scale. Demographic data was collected about age, gender, education level, socio-economic status, and smoking status. The data collected was analyzed using various statistical tests on SPSS version 25, and the subjects' demographic characteristics were explained using descriptive statistics. Data for comparative studies was analyzed by t-test and analysis of variance (ANOVA) at 0.05 significance levels.

The participants were informed about ethical considerations like informed consent, privacy, and confidentiality. Confidentiality was ensured by assigning a code for each participant, and participation was voluntary. The right to withdraw was explained to them before participation, and they were briefed about the nature and aim of the study. Verbal consent was obtained from each participant, and the data was confidential and anonymous, with access only given to the research team.

Results

The demographic characteristics of the sample are presented in Table 1. Sociodemographic data was collected from the participants by administering the demographic sheet. For the comparative study (Phase-I), out of 200 participants,100 (50%) were male, and 100(50%) were female. Regarding the age of the participants, 89 (44.5%) were between the age of 40-50 years, and 111(55.5%) were between the age of 51-65 years. The educational background of the participants was different; 70 (35%) were matric, 61(30.5%) were graduate, and 69(34%) were postgraduates (Figure 1). The socio-economic status of the participants was different: 67(33.5%) had low socio-economic status, 71(35.5%) had medium socio-economic status, and 62 (31%) reported high socio-economic status (Table 1).

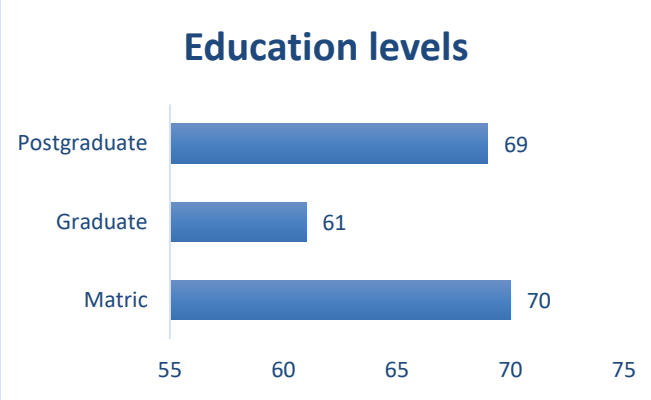

Figure 1: Education level of study population:

Table 1 Sociodemographic Characteristics of Participants at Baseline

Characteristics	**Psychosocial Factors study**	
	n	%
Gender	100	50
Male	100	50
Female	100	50
Age		
Middle age (40-50 years)	89	44.5
Old age (51-65 years)	111	55.5
Education		
Matric	70	35
Graduate	61	30.5
Postgraduate	69	34.5
Socio-economic Status		
Low socio-economic status	67	33.5
Medium socio-economic status	71	35.5
High socio-economic status	62	31

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Table 2 Anxiety level in Cardiovascular Disease Patients and Normal Participants (N= 200)

Variable	Normal participants (n=100)		CVD Patients (n= (100)		*t* (198)	*p*	*Cohen's d*
Anxiety	*M*	*SD*	*M*	*SD*			
	10.99	4.34	15.68	5.01	-7.08	0.00	1.00

Table 2 depicted that the anxiety level of CVD patients (M=15.68, *SD*=5.01) was significantly higher than the normal population (*M*=10.99, *SD*=4.34). The effect size was large (Cohen's *d* =1.00). The findings suggest that the anxiety scores of CVD patients were higher than those of the normal population.

There were significant differences among the anxiety level of male and female CVD patients (t (98) t= -1.90, p <. 05. The anxiety level of female CVD patients (M=16.36, SD=5.31) was reported to be significantly higher than male CVD patients (M =14.42, SD = 4.87). The effect size was small (Cohen's d = 0.38). The findings indicated that the anxiety scores of female CVD patients were higher than those of male CVD patients. (Table 3).

Anxiety levels among younger and older CVD patients did not differ significantly, *t* (198) = -1.45, p >0. 05. However, the results reflected that the mean anxiety scores of older CVD patients (*M* =15.98, *SD* =5.12) were higher than younger CVD patients (*M* =14.46, *SD* =5.16). The effect size was small (Cohen's *d* =0.30). (Table 4).

The mean differences in anxiety scores among three levels of education were non-significant *F* (2,97) = 1.68, p = >0.05, and partial η2 =0.03, and the effect size was small (Table 5).

Similarly, the comparison between the socioeconomic status is given in table 6.

Table 3 Impact of gender on anxiety level in cardiovascular disease patients (N= 100)

Variable	Male(n=50)		Female (n=50)		*t*(98)	p	Cohen's d
Anxiety	M	SD	M	SD			
	14.42	4.87	16.36	5.31	-1.90	0.03	0.38

Table 4 Impact of Age on Anxiety Level in Cardiovascular Disease Patients (N= 100)

Variable	Younger CVD Patients		Older CVD Patients		*t* (198)	p	Cohen's d
Anxiety	M	SD	M	SD			
	14.46	5.16	15.98	5.12	-1.45	0.06	0.30

Table 5 Impact of Education on Anxiety Level in Cardiovascular Disease Patients (N= 100)

Variable	Matric		Graduate		Postgraduate		*F*(2,97)	*p*	η2
Anxiety	M	SD	M	SD	M	SD	1.68	0.19	0.03
	15.29	5.10	14.21	5.37	17.00	4.92			

Table 6: Impact of socio-economic status on Level in Cardiovascular Disease Patients (N = 100)

Variable	Low Socioeconomic Status(n = 48)		Medium Socio-economic Status (= 39)		High Socioeconomic Status(=13)		*F* (2,97)	p	η2
Anxiety	M	SD	M	SD	M	SD			
	15.25	5.06	15.28	5.70	16.23	3.98	0.20	0.82	0.00

Discussion

The objective of this study is to compare the anxiety level in CVD patients to those in a control group without CVD. The study also examined the impact of gender, age, education, and socio-economic status on anxiety levels in CVD patients. Significant insights into the association between depression and CVD, as well as the influence of demographic variables, were provided by the study's findings.

The present study highlighted that CVD patients suffer from higher levels of anxiety as compared to the normal population. Anxiety disorders are common and persistent, and they have a lasting impact on functioning and cardiac health. Anxiety affects the general population, but it is more frequent among patients with coronary heart disease (CHD). Deter et al., 2023 also reported similar findings that anxiety is linked to new cardiovascular events (Deter et al., 2023). The focus of this paper was on the potential health effects of chronic anxiety. However, gender-specific analyses revealed that female CVD patients manifested higher levels of anxiety as compared to males. Older adults also revealed higher anxiety issues as compared to younger CVD patients. Education plays an important role in manifesting symptoms of anxiety in CVD patients. Less educated CVD patients revealed higher levels of anxiety. The impact of socio-economic status was non-significant. The results of the study conducted by Reiner et al. (2020) also revealed that anxiety is highly prevalent in adults from middle to old age, affecting women in particular. In our study, we found sex-specific associations between anxiety and cardiovascular disease (Reiner et al., 2020).

As mentioned earlier, the results have noteworthy ramifications for the field of therapeutic practice.

Healthcare practitioners need to acknowledge that persons with cardiovascular disease (CVD) have an increased susceptibility to depression, with a particular emphasis on females, older adults, those with lower educational attainment, and those with lower socio-economic positions. Consequently, it is recommended that healthcare providers include regular depression screening in the management of CVD patients. Integrating psychological support and targeted therapies, such as cognitive-behavioral therapy, into cardiac rehabilitation programs may effectively address mental well-being and cardiovascular results (Rafanelli et al., 2020). The constraints and limits of this particular research effort must be recognized and accepted. A potential limitation of the study's findings is that the sample size was relatively small, and the participants were selected exclusively from a single geographic region. Future studies should aim to use larger and more representative samples of the population to strengthen the internal consistency of their results.

Self-report instruments were also heavily relied upon, introducing the possibility of response bias in the research. Clinical interviews and objective assessments could be combined in future studies to learn more about depression in patients with cardiovascular disease (CVD) (Hare et al., 2014).

Different epidemiologic studies have found a link between anxiety and an increased risk of CVD. However, more effort is required to close significant knowledge gaps and transfer findings into better patient outcomes. The most pertinent factor in the prevention and treatment of anxiety in CVD patients seemed to be the psychophysiological dysregulation resulting in elevated levels of anxiety, which has a notable impact on those with cardiovascular disease. Further work is warranted to explore other significant matters, such as gender-related disparities in cardiovascular risk (Rozanski et al., 1999)..

Conclusion

The present study concluded a significant correlation between depression and cardiovascular disease (CVD), elucidating the influence of demographic variables. The findings of the study led to the conclusion that in patients with cardiovascular disease, anxiety disorders are common, persistent, and associated with poor functional and cardiac outcomes. A timely and accurate clinical diagnosis using DSM-5 criteria is critical. Safe and effective treatments are available for the management of these disorders in patients with cardiac disease, and it is hoped that such treatment can improve psychiatric health, quality of life, and medical outcomes. In addition, it is necessary to examine the intricate relationship between these variables and their influence on the mental and physical well-being of individuals with cardiovascular disease.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned.

Consent for publication

Approved

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Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

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