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Research Paper

A Study of Health Anxiety and Body Perception among Cardiovascular Patients and Healthy Individuals

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ABSTRACT

This study aimed to explore the difference in health anxiety and body perception among cardiovascular patients and healthy individuals. The study also aimed to find out the correlation between health anxiety and body perception among cardiovascular patients and healthy individuals. For the present study, a total sample of 140 individuals was selected from Dharwad and Vijayapura districts of Karnataka, India. The sample consisted of 70 individuals with cardiovascular disorders, and the remaining sample consisted of healthy individuals. The data collected from the sample was subjected to statistical analyses, including paired t-tests and bivariate correlation analyses. The results indicate that cardiovascular patients have higher levels of health anxiety and body perception than healthy individuals. It was also found that health anxiety and body perception are not related to each other among cardiovascular patients and healthy individuals.

Keywords: *Health anxiety, body perception, cardiovascular patients, healthy individuals, illness anxiety, illness perception*

The cardiovascular system is essential for sustaining life, functioning as a complex and highly integrated network regulated by multiple subsystems. These include central and peripheral components of the autonomic nervous system, as well as various humoral factors (Berntson et al., 2017). Its primary role is to deliver oxygen and nutrients to body tissues while eliminating metabolic waste. This process is maintained through a dynamic interplay of regulatory mechanisms, such as sympathetic and parasympathetic inputs, fluid and electrolyte balance, hormonal signaling, adrenal and renal function, and the influence of pharmacological agents (Chaudhry et al., 2021). Cardiovascular disease (CVD) encompasses a broad spectrum of conditions affecting cardiac function, including the myocardium, valves, coronary vasculature, and electrical conduction system. Each of these components is integral to overall cardiovascular integrity. Effective management strategies such as lifestyle interventions, pharmacotherapy, and surgical procedures aim to mitigate symptoms and slow disease progression (Hall, Guyton, & Hall, 2016). Among the most

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prominent categories of heart disease are Coronary Artery Disease (CAD) and cardiac arrhythmias.

Coronary Artery Disease (also known as Coronary Heart Disease) represents one of the most prevalent and lethal forms of CVD, with significant global impact across both high-income and low- to middle-income nations (Feigin et al., 2017). CAD is estimated to account for approximately 32.7% of all cardiovascular conditions and contributes 2.2% to the global burden of disease (Shahjehan & Bhutta, 2021). Pathophysiologically, CAD is characterized as an atherosclerotic inflammatory disorder that leads to the narrowing or blockage of coronary arteries, reducing oxygen and blood supply to the myocardium, and potentially resulting in major cardiac dysfunction (Rahman et al., 2022). CAD presents in various clinical forms, including myocardial ischemia and reperfusion injury, angina pectoris (stable, variant, or unstable), myocardial infarction, and atherosclerotic plaque buildup (Rahman et al., 2022). Cardiac arrhythmias refer to deviations in the heart's rhythm, manifesting as abnormally slow (bradycardia) or rapid (tachycardia) rates that may compromise cardiac output. Even subtle alterations in electrocardiographic patterns can precipitate arrhythmic episodes, often accompanied by symptoms such as chest discomfort, shortness of breath, fatigue, or, in severe cases, syncope due to inadequate perfusion (Anwar et al., 2018). Beyond CAD and arrhythmias, other cardiovascular conditions including heart failure, cor pulmonale, hypertension, valvular and inflammatory diseases, rheumatic heart disease, stroke, cardiomyopathies, peripheral arterial disease, and congenital anomalies pose significant health risks and require comprehensive medical attention (Mohan, 2018).

Health anxiety:

Health anxiety is one of the subtypes of anxiety disorders, excessive and negative misinterpretation of typical physical sensations in the absence of any underlying medical ailment. Essentially, health anxiety entails chronic beliefs that the individual has a serious disease or concerns that a current condition will have devastating consequences (McKay, Abramowitz, & Storch, 2017; Weck, Richtberg, & Neng, 2014; Abramowitz, Olatunji, & Deacon, 2007). Although mild expressions of health anxiety are pervasive within the general population and are deemed non-pathological, they do stimulate individuals to engage in healthy lifestyle behaviors, including medical consultation and avoidance of health hazards. Equally, more intense expressions can result in exaggerated illness concerns, somatization, and hypochondriac behavior especially in individuals with panic disorder (Karaer Karapıçak, Aktaş, & Aslan, 2012; Taylor, 2004). The most closely related condition to extreme health anxiety is hypochondriasis, and the two are frequently considered to exist on a continuum. Hypochondriasis is codified in official diagnostic systems such as in the ICD and DSM, while "health anxiety" is a more general, informal diagnosis describing analogous symptoms (Weck, Richtberg, & Neng, 2014; Marcus et al., 2007; Noyes et al., 2003). In DSM-5, the symptoms of health anxiety fall under somatic symptom disorder and illness anxiety disorder (McKay, Abramowitz, & Storch, 2017).

So far, only one investigation examined the association between health anxiety (HA) and various diseases in a general adult population (40–65 years old) by Noyes et al., (2000). Their results showed that high levels of HA were associated with hypertension, stroke, and chronic respiratory disease. Health anxiety also mediates the psychosocial effect of Multiple Sclerosis in patients with multiple sclerosis studies (Hayter et al., 2016). Diamond, Dysch, and Daniels (2023) discussed the prevalence of health anxiety in stroke survivors and its relationship with quality of life. The study reported that almost a third of stroke survivors

reported high levels of health anxiety, which was found to be significantly related to lower quality of life. The clinical correlates and prevalence of health anxiety in patients visiting neurology and psychiatry outpatient departments of a tertiary care hospital was investigated by Prabha et al., (2020). In 19% of neurological outpatients and 25% of psychiatric outpatients, they observed the presence of health anxiety. Higher education was linked to higher health anxiety, and those in professional occupations had more health anxiety than those with semi-professional occupations. Further, patients with somatoform disorders or with two or more psychiatric diagnoses showed higher health anxiety in both clinics (Prabha et al., 2020).

Body perception

Body perception, or the "sixth sense," refers to the subjective experience of internal bodily sensations. Body perception is important in observing internal physiological states and facilitating the control of emotions and subjective states. Feeling one's body is a specific phenomenological process, which is very different from just knowing a body as one's own. This sensation arises from an interplay between interoception, exteroception, and internalized body schema. Research on positive body perception emphasizes the importance of such internal templates, as they consistently emerge in qualitative research and provide a relatively upfront evaluative system (Tylka & Wood-Barcalow, 2015). In addition, body functionality offers a useful expansion of this system (Alleva & Tylka, 2021). As described by Alleva et al., (2019), body functionality includes the entire spectrum of what the body can do. This encompasses internal physiological activities (e.g., immune processes, digestion), physical actions (e.g., walking, stretching), sensory activity (e.g., vision, pleasure), artistic expression (e.g., drawing, singing), communication with others (e.g., through gestures, eye contact), and self-care behaviors (e.g., sleeping, personal hygiene). Body perception is a complex and multi-dimensional construct encompassing one's self-concepts and attitudes toward the body. It has cognitive, emotional, and behavioral aspects, and involves associated components including appearance evaluation, appearance orientation, body esteem, and body size accuracy.

The relationship between body perception and cardiovascular disease (CVD) is complex and dependent on a number of psychological and behavioral determinants. Research shows that participants with a better body image and self-esteem tend to engage in healthier behaviors, such as regular physical activity and healthy eating, more readily (Duncan et al., 2018). These behaviors are associated with decreased CVD risk indicators such as lower body mass index (BMI) and blood pressure. In the same manner, Rodgers et al., (2015) identify that positive body perception correlates with reduced levels of psychological distress namely, less stress, anxiety, and depression all being established causative factors of CVD. Their research further established that high body esteem is correlated with healthier lifestyle habits and lower cardiovascular risk. The correlation between people's body perception and cardiovascular disease (CVD) is not yet fully understood. Jayawardena et al., (2013) indicated significant disparities in body size perception among cardiac patients, with misperceptions becoming more significant as BMI rose. Precisely, more than two-thirds of overweight individuals and over half of the obese population under-estimated their weight, perceiving themselves as having normal or subnormal body size. Likewise, Lichtenstein, Henneman, and Flores, (2019) discovered that distorted body weight self-perception was linked with high levels of cholesterol and hypertension. The results indicate that increased awareness of body weight may play a significant role in improved cardiovascular risk factor control. In addition, maladaptive health habits like physical inactivity and low-quality

dietary patterns may be linked to negative body image, hence putting individuals at risk for developing CVD.

Relation between Health anxiety and Body perception:

Health anxiety and body perception are closely interconnected, with each exerting a significant influence on the other. Health anxiety, characterized by excessive concern about one's well-being, can contribute to altered body perception, wherein individuals may misinterpret or exaggerate normal bodily sensations. Individuals with elevated health anxiety often display heightened sensitivity to somatic symptoms. This increased attentiveness may foster fear and misattribution of benign sensations as signs of serious illness (Van Dessel, 2014). Anxious and hypochondriac patients demonstrated significantly stronger correlations between subjective heart rate perception and objective heart rate measurements (ECG) compared to individuals with phobic disorders (Tyrer, Lee & Alexander, 1980). Somatic symptoms observed in hypochondriasis and anxiety neurosis linked to heightened interoceptive awareness and increased attentiveness to bodily functions. Health anxiety has been linked to diminished accuracy and a biased pattern of interoceptive sensitivity, likely stemming from schematic processing of body-related information which is a cognitive tendency also observed in other somatoform disorders (Krautwurst et al., 2014; Schaefer, Egloff & Witthöft, 2012).

Research has shown that healthy individuals classified as kinesthetic augmenters those who overestimate the size of objects held with blindfolded tend to score higher on measures of hypochondriasis and display lower tolerance for experimentally induced pain (Petrie, 1978). Similarly, among patients with chronic, non-malignant organic pain, higher hypochondriasis scores were associated with more intense pain ratings (Ziesat, 1978). Additional studies have found that individuals reporting pain, particularly those with disease conviction or phobia, exhibit lower pain thresholds and tolerance (Merskey & Evans, 1975), a pattern also observed in psychiatric inpatients with disease phobias (Bianchi, 1973). Hitchcock and Mathews (1992) reported that college students with elevated health anxiety, as assessed by the Illness Attitudes Scale (IAS; Kellner et al., 1987), were more prone to interpret bodily sensations such as chest tightness, sweating, and flushing as signs of serious illness, like a heart attack, compared to those with lower IAS scores. Likewise, Marcus (1999) found a positive correlation between IAS scores and the tendency to view ambiguous symptoms (e.g., headaches) as indicative of severe medical conditions (e.g., brain tumors). Additionally, Barsky et al., (1993) demonstrated that individuals diagnosed with hypochondriasis were more likely than non-hypochondriac medical patients to interpret a greater number of physical symptoms as evidence of being unwell.

The present study:

Research focused on health anxiety and body perception has been carried out mainly in the western context. There are minimal studies on the relation between health anxiety and body perception in cardiovascular patients in the Indian context, and no study has ever addressed the differences of these variables among cardiovascular patients and healthy individuals. To bridge this research gap, the current study investigated the correlation between health anxiety and body perception among cardiovascular patients as well as the variability of these variables among cardiovascular patients and healthy populations by subjecting the following hypotheses to testing.

1. Cardiovascular patients have significantly higher health anxiety than healthy individuals.
2. Cardiovascular patients have significantly higher body perception than healthy individuals.
3. Health anxiety and body perception are positively and significantly related to each other.

METHOD

Participants and procedure:

For the existing study, a total sample of 140 individuals was selected from Dharwad and Vijayapura Districts of Karnataka, India. The sample consisted of 70 individuals with cardiovascular disorder and remaining sample consisted of healthy individuals. The individuals with cardiovascular disorder were selected from both private and government hospitals. Whereas healthy individuals were selected from door to door visit in the cities mentioned above. Participants' data were collected with their informed consent, and they were assured of the confidentiality of their responses. Participation was entirely voluntary.

Sample Selection Criteria:

Inclusion Criteria:

1. Patients with cardiovascular disease within the age group of 40 to 60 years were included.
2. For the healthy individuals group those did not have any cardiac issues and other physical health problems were included.

Exclusive Criteria:

1. Patients with congenital heart disease from infancy or childhood were excluded.
2. Patients with cardiovascular disease with other chronic illnesses such as arthritis, asthma were excluded.

Measures used:

1. **Demographic details:** A self-report questionnaire was used to collect demographic details including age, gender, domicile, educational background, order of birth, marital status, religion and profession.
2. **Body Perception Questionnaire (Short Form):** The Body Perception Questionnaire–Short Form (BPQ-SF), developed by Stephen W. Porges (2015), comprises 46 items and retains two of the original five subscales, such as body awareness and autonomic nervous system reactivity. Respondents rate each item using a five-point Likert scale ranging from 1 (never) to 5 (always), with an overall score derived by summing responses across all items. High scores indicate higher body perception whereas low scores show lower body perception. The Internal consistency of reliability for this scale is 0.93.
3. **Short Health Anxiety Inventory:** The Short Health Anxiety Inventory (SHAI), developed by Salkovskis and colleagues (2002), is an 18-item self-report measure designed to evaluate individuals' concerns about their health. It assesses three core components: health-related worry, sensitivity to bodily sensations or changes, and anticipated negative outcomes of illness. The SHAI yields a total score ranging from 0 to 54. High scores indicate higher health anxiety whereas low scores show lower health anxiety. The internal consistency of reliability for this scale is 0.91.

Statistical Analyses:

The data underwent thorough inspection, coding, and scoring before being analyzed using SPSS Version 25. The dataset was then screened for irregularities. Scoring of the assessment instruments followed the guidelines specified in their respective manuals. To evaluate the study's hypotheses, the data were subjected to statistical procedures, including paired samples' t-tests and bivariate correlation analyses.

RESULTS

Table 01: Mean, standard deviation and 't' value on health anxiety for cardiovascular patients (n = 66) and healthy individuals (n = 66)

Variable	Sample	Mean	SD	't' value
Health anxiety	Cardiovascular patients	23.72	3.84	28.77***
	Healthy individuals	5.93	2.02	

*** = *significant at 0.001 level*

Table 01 displays the mean scores, standard deviations, and the t-value between cardiovascular patients and healthy individuals on the health anxiety. Cardiovascular patients had a significantly higher mean score (M = 23.72, SD = 3.84) than healthy controls (M = 5.93, SD = 2.02). The calculated t-value of 28.77 is very highly significant ($p < .001$), reflecting a large difference between the two groups in levels of health anxiety, with cardiovascular patients showing much higher health anxiety.

Results of our study align with the studies conducted by Heshmati et al., (2021). They investigated whether levels of spiritual well-being and hope could serve as predictors of health anxiety in individuals with advanced coronary artery disease. The researchers found high levels of health anxiety in this population predicted by spiritual well-being and hope. Hayter et al., (2016) investigated the influence of health anxiety on the quality of life among individuals with multiple sclerosis (MS), with a particular focus on the role of cognitive factors in sustaining health-related anxiety. Their findings suggest that health anxiety may play a mediating role in the psychosocial challenges experienced by MS patients.

Our results are similar to the findings of studies conducted by Diamond, Dysch, and Daniels (2023), in which they examined the prevalence of health anxiety among stroke survivors and its impact on quality of life using a cross-sectional design that compared individuals with high versus low levels of health anxiety. The study found that nearly one-third of stroke survivors exhibited clinically significant health anxiety, which was strongly linked to reduced quality of life. Altintas et al., (2023) investigated the relationship between health anxiety and glycemic control in individuals with type 2 diabetes mellitus (T2DM), focusing on factors associated with health anxiety in relation to HbA1c levels. The study found a positive correlation between the severity of depressive symptoms and health anxiety. Additionally, factors such as higher educational attainment, lower socioeconomic status, employment, and regular physical activity were associated with lower health anxiety scores (as measured by the SHAI) among patients with T2DM.

Bozkurt Zincir et al., (2014) examined anxiety levels and somatic perception among patients presenting with chest pain at a cardiology clinic. The study included 51 individuals with non-cardiac chest pain (NCCP) and 51 healthy controls. Results indicated significant differences across all subscales of the Toronto Alexithymia Scale (TAS) between the two groups. Notably, patients with a total TAS score above 50 also reported significantly higher

health anxiety ($P = 0.045$). The findings suggest that anxiety, heightened somatic symptoms, and an exaggerated perception of bodily sensations are prevalent among individuals with NCCP.

Table 02: Mean, standard deviations and 't' value on body perception for cardiovascular patients (n = 66) and healthy individuals (n = 66).

Variables	Sample	Mean	SD	't' value
Body awareness	Cardiovascular patients	50.40	5.67	22.41***
	Healthy individuals	32.56	2.17	
ANS reactivity	Cardiovascular patients	36.43	6.52	15.05***
	Healthy individuals	23.51	1.57	
Body perception	Cardiovascular patients	86.84	10.8	21.16***
	Healthy individuals	56.12	2.90	

*** = *significant at 0.001 level*

Table 02 summarizes the mean scores, standard deviations, and t-values for cardiovascular patients and healthy individuals on body perception and its dimensions. For the first dimension, body awareness, cardiovascular patients reported a very significantly higher mean score (M = 50.40, SD = 5.67) than healthy individuals (M = 32.56, SD = 2.17), with a t-value of 22.41 ($p < .001$), indicating heigher body awareness among cardiovascular patients.

Regarding the second dimension, autonomic nervous system reactivity, the mean score for cardiovascular patients was 36.43 (SD = 6.52), while for healthy individuals it was 23.51 (SD = 1.57). The obtained t-value of 15.05 ($p < .001$) suggests very significantly greater autonomic reactivity in the patient group.

Finally, on the overall measure of body perception, cardiovascular patients scored higher (M = 86.84, SD = 10.80) compared to healthy individuals (M = 56.12, SD = 2.90), with a t-value of 21.16 ($p < .001$), reflecting a very significantly elevated perception of bodily sensations among individuals with cardiovascular conditions.

The results of our study (Table 02) show similarities with previous literature findings. Pokrajac-Bulian and Ambrosi-Randić (2020) explored the relationship between individuals' perceptions of their illness and levels of cardiac anxiety, general anxiety, and depression in overweight and obese men and women diagnosed with cardiovascular disease (CVD). They found that illness perception which is a correlate of body perception tend to be higher among cardiovascular patients. Thagizadeh et al., (2022) investigated the association between illness perception and cardiovascular risk factors in patients with myocardial infarction undergoing percutaneous coronary intervention. Their findings revealed significant associations between illness perception and lifestyle factors such as physical activity, diet, sleep quality, and overall health. Additionally, they identified direct and significant relationships between illness perception and biometric indicators (including cholesterol, glucose levels, and blood pressure).

Our results also show consistencies with the findings of Greco et al., (2014) examined whether illness perceptions, self-efficacy beliefs, and perceived social support mediate the association between illness severity and depression in individuals with cardiovascular

disease. Their results indicated that the link between left ventricular ejection fraction and depressive symptoms was mediated by the perceived identity of the illness, confidence in managing cardiac risk factors, and levels of perceived social support. Mosleh and Almalik (2016) examined how patients with coronary heart disease perceive their illness and assessed whether these perceptions could serve as predictors of adherence to healthy lifestyle behaviors. Their findings suggest that patients' beliefs about their illness may be viable targets for psycho-educational interventions aimed at enhancing disease self-management and promoting greater compliance with recommended health practices.

Table 03: Correlation coefficient for the scores of health anxiety and body perception for cardiovascular patients (n = 66)

Variables	Health anxiety	Body perception
Health anxiety	1	-0.06
Body perception		1

Table 03 shows that there is no significant relationship between health anxiety and body perception among cardiovascular patients. The results are similar to the findings of Steptoe and Vögele (1992), in which they reported that individuals did not consistently demonstrate accurate perception across different physiological domains, and this accuracy was unrelated to the magnitude of physiological changes or subjective sensation ratings. Furthermore, trait anxiety showed no significant association with the accuracy of somatic perception.

The results of our study (Table 03) are against the previous literature. Lee et al., (2019) examined whether psychological states specifically depressive symptoms and anxiety are associated with the congruency between individuals' health perceptions and their objectively estimated risk for cardiovascular disease (CVD), particularly in adults with two or more CVD risk factors. The study found that individuals experiencing depressive symptoms were more likely to exhibit a mismatch between their perceived health status and their actual cardiovascular risk. This suggests that depression may distort health perception, leading individuals to either underestimate or overestimate their health status.

Aulakh et al., (2025) investigated gender-related variations in pain perception and anxiety sensitivity, examining how these factors jointly influence health-related quality of life (HRQoL) among individuals recovering from myocardial infarction (MI). The study reveals notable gender differences in anxiety sensitivity, pain perception, and fear of pain among patients with acute MI. The findings underscore the association between pain perception and anxiety sensitivity which correlate in sequence with body perception and health anxiety. Ari, Sinaga, and Triastuti (2025) explored the relationship between illness perceptions and anxiety levels in individuals receiving outpatient care for hypertension. Their findings indicate that more negative perceptions of illness are significantly correlated with heightened anxiety in this population.

Table 04: Correlation coefficient for the scores of health anxiety and body perception for healthy individuals (n = 70)

Variables	Health anxiety	Body perception
Health anxiety	1	0.10
Body perception		1

Table 04 shows that there is no significant relationship between health anxiety and body perception among healthy individuals. The results are against the previous findings of Trevisan, Tsheringla, and McPartland (2023), in which they investigated variability in commonly used measures of interoceptive attention by examining their associations with emotion-related constructs, and further analyzed the interoceptive processes underlying health anxiety in the general population. Their results suggest that interoceptive accuracy serves as a moderating factor in the link between maladaptive interoceptive attention and health anxiety.

In contrast with our results, Ezmeirlly and Farahat (2019) investigated the prevalence and contributing factors of illness anxiety disorder among medical students in western Saudi Arabia. Their findings revealed a strong correlation between the perception and distress components of the Medical Student Disease (MSD) scale. Additionally, both components showed significant associations with scores on the Short Health Anxiety Inventory (SHAI).

CONCLUSION

It can be concluded that cardiovascular patients have higher health anxiety than healthy individuals. Cardiovascular patients also have higher body perception than healthy individuals. There is no significant relationship between health anxiety and body perception among cardiovascular patients and healthy individuals.

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Conflict of Interest

The authors have no competing interests to declare that are relevant to the content of this article.

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