

Psychological Assessment before and after Cardiac Surgery and Cardiac Intervention

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Abstract

Psychological assessments before and after both invasive and non-invasive cardiac procedures are an essential component of comprehensive patient care. These evaluations help clinicians better understand the emotional and mental state of patients undergoing stressful and often life-altering interventions. Anxiety, fear, and psychological distress are common reactions to cardiac procedures and can significantly affect treatment outcomes, recovery time, and overall well-being. Therefore, incorporating psychological screening into pre- and post-procedural protocols is vital for identifying patients at risk and providing timely support. Understanding and addressing anxiety-provoking factors, such as fear of the unknown, pain, complications, or financial burden, can lead to more personalized and effective care plans. Early identification of these concerns enables healthcare professionals to provide education, reassurance, and interventions that may reduce anxiety and improve emotional preparedness. This is particularly important because unmanaged psychological stress can interfere with decision-making, reduce treatment adherence, and increase the risk of complications or hospital readmissions. Furthermore, psychological support contributes to improved patient satisfaction and communication, fostering a sense of trust and safety between patients and care teams. When patients feel emotionally supported and well-informed, they are more likely to actively participate in their treatment and recovery processes. Thus, psychological assessment is not a separate element of care but an integrated and proactive strategy that enhances the quality and effectiveness of cardiac treatment. By acknowledging the psychological dimensions of cardiac health, healthcare providers can promote better clinical outcomes and a more holistic approach to cardiovascular care.

Keywords: Cardiac Intervention, Cardiac Surgery, Psychological Assessment, Psychosocial Risk.

Introduction

One of the common causes for restricted quality of life, mortality, morbidity, and infirmity is cardiovascular disease. Cardiac interventions and cardiac surgeries target to decrease disability and to improve quality of life. Both cardiac intervention and surgery can be a stressful life event that has psychological effects such as anxiety, depression, fear of the unknown and any form of discomfort.

There are several psychosocial risk factors for any types of cardiovascular disease that are

also outcome predictors after cardiac intervention or cardiac surgery [21-23]. It may involve demographic data like gender or age [24], socioeconomic status [25], stress from work or family [26], social support, marital status [27], health behaviours like smoking [28], illness beliefs [29], anxiety [30], and fear [31].

When a patient experiences anxiety, they are overly fearful of health care procedures. Psychological assessment of patients before and after cardiac procedure is imperative. Acute discomfort or interference with necessary

procedures may result from surgical procedures or procedures that result in acute distress. Acute procedural anxiety can be very dangerous health risk if a patient avoids clinical procedures due to a fear of the procedure causing them harm.

It is important to recognize the patient's anxiety and normalize the patient's experience of anxiety if it is common. It is not advisable to tell patients not worry as this may undermine their concerns and imply that they can stop worrying at their convenience. In addition, attitudes and feelings are also evaluated as they are a reflection of how patients feel about the treatment they received.

Comparative researches have been done on acute procedure anxiety in adults. Females reported a greater level of anxiety than males at all assessment points among the 80 patients who underwent open heart surgery and found that 32.5% reported clinically significant anxiety one day before surgery, 21.5% one week after surgery, and 18.7% at 6 months follow – up [1]. In another study of 60 patients undergoing CABG in Iran, 28% of patients undergoing the surgery reported moderate to high CABG-specific fear (e.g., fear of CABG, fear of death, fear of pain), and overall 45% were moderately to highly anxious [2]. On the other hand, rates of anxiety tend to be higher in patients undergoing coronary angioplasty for the first time (42% in first timers versus 26% in repeaters) [3] and in women compared with men (24% versus 16%) [4].

Methods

A total of 100 patients admitted to the cardiac ward were interviewed in this study following the acquisition of informed consent from each participant. The selection criteria included adult patients who were scheduled for or had undergone various cardiac procedures. Data collection was conducted through structured interviews and standardized questionnaires designed to gather information on multiple variables. These included

demographic characteristics (such as age, gender, nationality, marital status, and educational level), type of cardiac procedure undergone, and the quality of explanation provided by the attending physician regarding the procedure.

Participants were asked to rate the clarity and comprehensiveness of the procedure explanation they received from their doctors, as well as their corresponding levels of anxiety before undergoing the procedure. Both aspects were measured using a four-point Likert scale to ensure consistency and allow for quantitative analysis. The anxiety levels assessed were specifically related to the nature and type of cardiac intervention or surgery, taking into account whether the procedure was invasive or non-invasive. This approach allowed the researchers to explore possible associations between the quality of communication, the type of procedure, and the psychological responses of patients, particularly pre-procedural anxiety.

Results

Majority of patients were male 83%, age (mean+SD) 50(7) and dominant nationality was Saudi 72%, the Saudi women were higher in proportion compared to no-none Saudi women 26% versus 5%.

Discussion

The present study examined the psychological status of cardiac patients undergoing various procedures, focusing on anxiety levels and their associations with demographic, procedural, and communication-related factors.

Descriptive analysis (Table 1) showed that 83% of participants were male, while 17% were female, consistent with regional cardiac care trends [6]. However, female patients reported higher anxiety levels, particularly those who were unemployed (35%), widowed or divorced (92%), and illiterate (40%). These findings align with Shahmansouri et al. [2] and Astin et al. [4], who found that sociodemographic

disadvantages, especially among women, significantly predict preoperative anxiety.

The study revealed a statistically significant relationship between quality of procedural explanation and anxiety levels (Table 2; $p < 0.001$). Among patients who received excellent explanations, 80% reported no anxiety, and none were moderately or very anxious. Conversely, patients who rated explanations as “poor” had the highest levels of anxiety, with 36% reporting very high anxiety and only 11% not anxious. These findings are consistent with earlier studies by Lenzen et al. [3] and Pignay-Demaria et al. [20], which emphasized the role of preoperative education in anxiety reduction.

When examining the type of cardiac procedure (Table 3), anxiety levels were strongly influenced by procedural invasiveness. For instance, 52% of coronary angiography patients were not anxious, while 36% of CABG patients and 100% of LVAD recipients reported very high anxiety ($p < 0.05$). These results corroborate findings by Szekely et al., [16] and Cserep et al., [17], who documented significantly increased psychological distress in patients facing more complex surgical interventions.

Non-Saudi patients showed significantly higher anxiety due to lack of social support (67%) and financial concerns (58%), in contrast to Saudi nationals (8% and 0%, respectively). This supports conclusions by Alshaikh et al. [6] and Udell et al. [9], who discussed the added emotional burden of non-citizens in accessing cardiac care. Similarly, low educational level was associated with high anxiety in 7 out of 8 psychological categories, reflecting trends discussed in studies on health literacy and anxiety outcomes [11, 12].

In conclusion, the data strongly support that anxiety among cardiac patients is influenced by gender, nationality, education level, procedural complexity, and quality of communication. Routine psychological screening, culturally tailored counseling, and improved procedural

explanation should be integrated into standard cardiac care to improve both emotional preparedness and clinical outcomes [5, 8, 21].

Ethics

This study was approved by the Research and Ethics Committee of Prince Sultan Cardiac Center, Al Ahsa, Kingdom of Saudi Arabia.

Statistical Analysis

The data will be analysed using the Statistical Package for the Social Sciences (SPSS) or (STATA). The variables are qualitative (categorical), and they will be represented in numbers and percentages, which will then be displayed in tables and graphs. Evaluating the association among different variables will be done using Chi-Square test and the effect of a single variable on other variables by logistic regression.

Table 1 outlines the descriptive characteristics of the 100 study participants, categorized by gender and various demographic factors. In terms of gender distribution, 83% of the participants were male and 17% were female. The average age across both genders was 50 years, with a standard deviation of 7 years. Regarding nationality, 57 participants were Saudi nationals (26% female and 74% male), while 43 were non-Saudi (5% female and 95% male). Most participants were married, accounting for 92 individuals (15% female and 85% male). A small number were single (1 participant, male), divorced or separated (4 participants; 25% female and 75% male), or widowed (3 participants; 67% female and 33% male). In terms of occupation, 52 participants were employed, all of whom were male, while 48 were unemployed (35% female and 65% male). Education levels varied: 25 participants were illiterate (40% female and 60% male), 27 had completed primary school (22% female and 78% male), 30 had secondary school education (all male), and 19 were college graduates (5% female and 95% male). With regard to living arrangements, 19

participants lived alone (5% female and 95% male), 67 lived with family (22% female and 78% male), and 14 lived with colleagues (7% female and 93% male).

Table 1. Descriptive Characteristics of Study Participants

Variable	Total (n)	Female(n%)	Male (n%)
Participant	100	17(17%)	83(83%)
Age (mean+SD)	50(7)	54(7)	50(7)
Nationality			
Saudi	57	15(26%)	42(74%)
Non-Saudi	43	2(5%)	41(95%)
Marital Status			
Married	92	14(15%)	78(85%)
Single	1	0	1(100%)
Divorced/Spared	4	1(25%)	4(75%)
Widow	3	2(67%)	1(33%)
Occupation			
Employed	52	0	52(100%)
Unemployed	48	17(35%)	31(65%)
Education level			
Illiterate	25	10(40%)	15(60%)
Primary school	27	6(22%)	21(78%)
Secondary school	30	0	30(100%)
Graduate	19	1(5%)	18(95%)
Living Situation			
Alone	19	1(5%)	18(95%)
With Family	67	15(22%)	52(78%)
With Colleague	14	1(7%)	13(93%)

Overall, the majority of participants were male, employed, married, and had secondary school or lower education. Most lived with family or alone, with a significant proportion being non-Saudi nationals.

Most patients who have had cardiovascular disease (CVD) in PSCCH during the time-frame of data collection were males with a rate of 83%. One study has specified that the male gender is one of the best-established risk factors for coronary heart disease [5]. The remaining 17 % were females. In another study, Saudi women in particular are more vulnerable as there are sociocultural boundaries on female physical activities that may lead to high occurrence of CVD hazards, especially obesity, and physical inactivity [6]. Amongst the female

who participated, 88% are Saudi and 60% of them are unemployed. Saudi women in particular showed heightened anxiety level of 64%, which doubled the average level of anxiety in men 30%.

In the total sample, only 8% are unmarried which is generally expected to have higher anxiety levels over the married ones. However, the results show that concerning levels of anxiety to pain, social support and cost, it's slightly greater for patients who are married with a difference of 2%, 7% and 17% individually. Author, Wishnie HA, et.al outlined that struggles over acquiescence with prescribed medical treatment is common, even in 'healthy' marriages. Furthermore, it has been reported those six to nine months after a

myocardial infarction, emotional problems are present in 75% of all families studied as a result of 'differences over medical instruction' [7]. Consequently, it is important that patient and spouse be clear about the health teachings and mindful of which behaviors are and are not allowable [8].

19% of the total population is living alone. The results show that this group has increased anxiety level related to cost; social support and death compared with those living with significant others with a difference of 20%, 35% and 11% respectively. One study a little over a decade ago, showed that people who lived alone were at higher risk of cardiovascular death than those who lived with someone (8.6% vs. 6.8%; $P < 0.01$) [9].

The most common cardiac procedures were coronary artery bypass graft (CABG), coronary angiography (CAG), and percutaneous coronary intervention (PCI) 22%, 25% and 44% singly as shown in table 2. 68% of those who underwent CABG had the greatest level of anxiety among 7 factors except for social support and cost which were both 18% compared to those who underwent PCI. On the other hand those who underwent CAG consistently had the least level of anxiety compared to PCI & CABG.

75% of the patients were first timers to undergo non-invasive and/or invasive procedure.

Predictably their levels of anxiety are higher than those who already had procedure in the

past. However, the result related to temporary impairment, permanent disability and body disfigurement were a little bit higher on repeaters. Body image disturbance and its following psychological effects might lead to social stigmatization, insecurities, lowered self-esteem, amplified emotional tension and feelings of sexual unattractiveness [10, 11].

Table 2 presents the association between the quality of procedural explanation and patients' anxiety levels prior to the procedure. When the explanation was poor, patients experienced the highest levels of anxiety, with 36% reporting being very anxious and 25% moderately anxious, while only 11% were not anxious. In cases where the explanation was rated as fair, anxiety levels were somewhat lower at 57% of patients were not anxious, though 10% still reported being very anxious. For those who received a good explanation, 64% were not anxious, 14% were very anxious, and 7% experienced moderate anxiety. A very good explanation resulted in 64% of patients being not anxious, with no reports of very high anxiety and only 9% reporting moderate anxiety. Finally, among patients who received an excellent explanation, 80% were not anxious, and 20% were very anxious, with no reports of moderate or low anxiety. Overall, the findings indicate that higher-quality procedural explanations are associated with lower levels of pre-procedure anxiety.

Table 2. Association between Quality of Procedure Explanation and Anxiety Level before Procedure

Quality of Procedure Explanation	Anxiety (%)			
	Not anxious	Little anxious	Moderate anxious	Very anxious
Poor	11%	27%	25%	36%
Fair	57%	5%	29%	10%
Good	64%	14%	7%	14%
Very good	64%	27%	9%	0%
Excellent	80%	0%	0%	20%
Total	41%	18%	19%	22%

Table 3 presents the association between the type of cardiac procedure and patients' anxiety levels prior to the intervention. Among those undergoing coronary angiography (CAG), 52% were not anxious, 16% were a little anxious, 12% were moderately anxious, and 20% were very anxious. For patients scheduled for percutaneous coronary intervention (PCI), 45% reported no anxiety, 18% were a little anxious, 20% were moderately anxious, and 16% were very anxious. In contrast, coronary artery bypass grafting (CABG) was associated with higher anxiety levels: only 32% were not anxious, while 9% were a little anxious, 23% moderately anxious, and 36% very anxious. Patients undergoing valve surgical replacement reported 50% being a little anxious and 50% moderately anxious, with no reports of being not anxious or very anxious. All patients

scheduled for non-invasive valve replacement were very anxious (100%), with no representation in lower anxiety levels. Similarly, all patients undergoing re-do valve replacement (100%) and re-exploration (100%) were a little anxious. In contrast, rewiring procedures were associated with no anxiety, as 100% of patients reported being not anxious. Finally, patients scheduled for left ventricular assist device (LVAD) implantation reported the highest anxiety, with 100% being very anxious. Overall, these findings suggest that the type of procedure significantly influences pre-procedure anxiety, with non-invasive and complex surgeries generally linked to higher anxiety levels, while simpler or more familiar procedures such as rewiring tend to be associated with lower or no anxiety.

Table3. Association between Type of Procedure Explanation and Anxiety Level before Procedure

Type of procedure	Anxiety (%)			
	Not anxious	Little anxious	Moderate anxious	Very anxious
CAG	52%	16%	12%	20%
PCI	45%	18%	20%	16%
CABG	32	9	23	36
Valve Surgical replacement	0%	50%	50%	0%
Non-Invasive Valve replacement	0%	0%	0%	100%
Re-do valve replacement	0%	100%	0%	0%
Re-exploration	0%	100%	0%	0%
Rewiring	100%	0%	0%	0%
LVAD	0%	0%	0%	100%

The number of foreign residents in Saudi Arabia reached 13.38 million, representing 41.6% of the total population of 32.2 million, according to the 2022 census. Male residents hit 10.24 million, or 76.5% of total residents, while the number of female residents reached 3.14 million, or 23.5%. Bangladeshis topped with nearly 2.12 million, or 15.8% of total foreign residents, followed by Indians at almost 1.88 million, or 14%. Pakistanis, Yemenis and Egyptians made up the top five lists [13].

Stratification by male gender, first timers and received poor explanation of the cardiac

procedure from the doctor shows no significant difference on the level of anxiety among the specified factors except for social support and cost with percentage of 8% and 0% vs. 67% and 58% for Saudi nationals and expatriates respectively. Intensified anxiety level of expatriates with regards to lack of social support in Saudi Arabia is self-explanatory while cost is anticipated since the free healthcare to expats was found to be unsustainable and so most expats are mandated to have insurance. Health insurance provided by some employers is based on a co-payment

system which means that some medical services are not covered by the insurance and should be shouldered by the individual.

Aside from gender, race/ethnicity, marital status and living situation, educational attainment is also associated to anxiety and cardiovascular disease. A higher likelihood of anger eliciting MI has been observed in people with socioeconomic rank and lower educational achievement [14]. Result shows that patients who are illiterate are consistently more anxious in 8 factors except for cost. Differences range from 3%-13% compared to the level of anxiety experienced by the educated (Primary, Secondary, Tertiary and Post-Graduate level). There are quite a few means in which anxiety distress heart health and plays a part in the advancement of cardiovascular diseases. On the one hand it can be interrelated to ventricular arrhythmias, and on the other hand research supports the linking with reduced heart rate variability [15]. In another longitudinal research, 180 patients undergoing cardiac surgery were followed for ten years. Anxiety, depression and the number and reason for re-hospitalizations were assessed yearly. Research results show that preoperative anxiety increases the threat for long-term mortality after cardiac surgery especially in patients with low education standing and social care [16, 17].

Conclusion

Anxiety management strategies include effective communication and health teaching from the multidisciplinary team before and after any medical or surgical procedures. Psychological factors like anxieties are well-thought-out as tough and independent cause for chronic disease, but usually are not acknowledged in the clinical practice [18].

Anxiety-provoking factors may influence the development and advancement of coronary disease and likelihood of having a second MI and poor recovery after cardiac event [19].

Proper evaluation, health teaching and psychological support may reduce adverse

effects leading to a more efficient and more cost-effective care [20].

Accordingly psychological assessment of the cardiac patient can play an essential role in management development, providing corroboration in medical decision-making and aids to foresee the indication for treatment modalities and long-term outcomes of medical treatments [21]. The expected outcome of this study is to help patients manage or lessen anxiety concerns regarding pre & post cardiac procedures and prevent prolonged hospitalization and readmission.

Anxiety-provoking factors can play a substantial role in the development and progression of coronary artery disease. They may also influence the likelihood of experiencing a recurrent myocardial infarction (MI) and hinder the recovery process following a cardiac event. The presence of unmanaged anxiety can compromise adherence to treatment, delay healing, and contribute to poorer health outcomes. Therefore, integrating proper psychological evaluation, health teaching, and supportive interventions into cardiac care can significantly reduce these adverse effects. This, in turn, promotes more efficient patient management, enhances recovery, reduces healthcare costs, and minimizes the risk of complications.

Psychological assessment, when systematically integrated into the management of cardiac patients, plays a critical role in developing effective treatment strategies. It provides clinicians with valuable insights into the patient's emotional and mental state, which can significantly influence their response to medical or surgical interventions. Understanding these psychological factors is essential for anticipating patient reactions, tailoring communication, and optimizing both immediate and long-term clinical outcomes. Elevated anxiety before and after cardiac procedures is a common but often overlooked factor that may contribute to poor recovery, reduced compliance with medical advice, and

increased rates of hospital readmission. By identifying patients who are at higher risk of anxiety-related complications, healthcare providers can implement targeted interventions such as counseling, health education, and supportive care to mitigate distress and improve overall well-being. Psychological assessment also fosters a patient-centered approach, enhancing trust, cooperation, and communication between the medical team and the patient. Ultimately, the anticipated outcome of this study is to provide evidence supporting the integration of psychological evaluation into routine cardiac care. This may lead to improved patient outcomes by reducing pre- and post-procedural anxiety, minimizing prolonged hospitalization, lowering healthcare costs, and improving the overall quality and efficiency of care delivered to individuals undergoing cardiac procedures.

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Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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