

The Psychological and Social Impact: A Study of Yemeni Patients who Underwent Cardiac Surgery in India

الأثر النفسي والاجتماعي: دراسة على مرضى يمنيين خضعوا لجراحة القلب في الهند

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ABSTRACT :

- Key Words:**
- Cardiac surgery
 - psychological
 - social
 - anxiety
 - depression
 - Yemeni Patients
 - India

Objective: This study aimed to describe the changes in anxiety, depression and satisfaction of Quality of Life in Yemeni patients who underwent cardiac surgery.

Materials and Methods: This is a retrospective, cross-sectional study using mixed methods: qualitative interviews and quantitative psychometric tools.

The sample included 150 Yemeni patients treated in India between 2020 and 2024. Patients were recruited via the Yemeni Medical Attaché in Mumbai and three cardiac centres in New Delhi, Mumbai, and Hyderabad.

Instruments Used: Beck Depression Inventory, Hospital Anxiety & Depression Scale, and World Health Organization measuring Quality of Life.

Statistical analyses for the collected data were performed using the Excel program. Mean value was used for continuous variables, numbers and percentages were used to show categorical data.

Results: 150 Yemeni cardiac patients treated in India were randomly selected. They were (70%) males and (30%) females. The mean age of all patients was 52 years.

Most patients (80%) travelled with close relatives. Patients who underwent Coronary artery bypass graft represented the higher number of patients (56%)

Moderate-Severe Anxiety represented in (81.3%) of the patients in preoperative surgery and decreased to (29.3%) in postoperative surgery.

Moderate Severe Depression was in (58.7%) of the patients in the preoperative period and decreased to (22%) in postoperative period.

High satisfaction Quality of Life was found in (23.3%) of the patients in preoperative surgery and increased to (74%) in

	postoperative period. In Coronary artery bypass graft, the preoperative anxiety was (79%) and decreased to (28%). Depression in preoperative both Coronary artery bypass graft + Valve Replacement were found in (65.3%) of the patients. Satisfaction of High Quality of Life in postoperative period among patients accompanied with close relative was in (78%) of the patients. Conclusion: It was concluded that the relationship between psychosocial factors, family support versus the preoperative status of the patients plus postoperative outcomes is essential to achieving optimal outcomes in cardiac surgery.
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المخلص:

الكلمات الافتتاحية: • جراحة القلب • نفسي • اجتماعي • قلق • اكتئاب • مرضى يمنيون • الهند	الهدف: استهدفت هذه الدراسة وصف التغيرات في القلق والاكتئاب ورضا المرضى اليمنيين عن جودة حياتهم بعد خضوعهم لجراحة القلب. المنهجية: هذه دراسة استرجاعية مستعرضة، استخدمت منهجية مختلطة: المقابلات النوعية والأدوات القياسية النفسية. . شملت العينة 150 مريضاً يمينياً تلقوا العلاج في الهند بين عامي 2020 و2024. تم تجنيد المرضى عن طريق الملحق الطبي اليمني في مومباي، وثلاثة مراكز قلبية في نيودلهي ومومباي وحيدر آباد. استخدمنا الأدوات التالية: مقياس بيك للاكتئاب، ومقياس القلق والاكتئاب في المستشفى، ومنظمة الصحة العالمية لقياس جودة الحياة. يسافر معظم المرضى (80%) برفقة أقاربهم المقربين. جريت التحليلات الإحصائية للبيانات المجمعة باستخدام برنامج إكسل. استُخدم المتوسط الحسابي للمتغيرات المستمرة، بينما استُخدمت الأرقام والنسب المئوية لعرض البيانات الفئوية. النتائج: اخترنا عشوائياً 150 مريضاً يمينياً مصاباً بأمراض القلب، تلقوا العلاج في الهند. كان 70% منهم ذكوراً و30% إناثاً. بلغ متوسط عمر جميع المرضى 52 عاماً. وشكّل المرضى الذين خضعوا لجراحة مجازة الشريان التاجي النسبة الأكبر (56%). وبلغت نسبة المرضى الذين عانوا من قلق متوسط إلى شديد 81.3% قبل الجراحة، وانخفضت هذه النسبة إلى 29.3% بعد الجراحة. كانت نسبة الاكتئاب المتوسط إلى الشديد (58.7%) لدى المرضى في الفترة ما قبل الجراحة، وانخفضت إلى (22%) في الفترة ما بعد الجراحة. تم العثور على مستوى عالٍ من الرضا عن جودة الحياة لدى (23.3%) من المرضى في الجراحة قبل العملية الجراحية وارتفع إلى (74%) في فترة ما بعد الجراحة. في عملية ترقيع الشريان التاجي، انخفض القلق قبل الجراحة (79%) إلى (28%) بعد الجراحة. تم العثور على الاكتئاب قبل الجراحة لكل من جراحة تحويل مسار الشريان
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	التاجي واستبدال الصمام لدى (65.3%) من المرضى. بلغت نسبة الرضا عن جودة الحياة العالية في فترة ما بعد الجراحة بين المرضى الذين يرافقهم أحد الأقارب المقربين (78%). الاستنتاج: خلصنا إلى أنَّ العلاقة بين العوامل النفسية والاجتماعية، ودعم الأسرة، والحالة الصحية للمرضى قبل الجراحة، إضافةً إلى نتائج ما بعد الجراحة، تُعدُّ أساسية لتحقيق أفضل النتائج في جراحة القلب.
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Introduction

The importance of psychosocial factors in recovery from a heart-related medical procedure has become more widely recognized. Physical qualities and medical therapy are not the only elements influencing postoperative and long-term healing results. Social and psychological factors, particularly sadness and anxiety, may also have an impact (Rosengren et al., 2004; Székely, et al. 2007). In the context of Yemen's prolonged humanitarian crisis, the collapse of specialized cardiac care has pushed thousands to seek treatment in India (Horowitz et al., 2007; Moser & Dracup, 2010).

The movement of patients across borders reflects not only economic and medical factors but also psychosocial determinants including anxiety, fear, and cultural displacement (Al-Kubaisi et al., 2011; Gatrell et al., 2011).

Procedures such as coronary artery bypass grafting (CABG), valvular diseases, and aortic surgery are essential for improving patient survival. Among these, postoperative depression and anxiety hold an equally important place as the outcomes of the surgery (Protogerou et al. 2015). According to a published study (Vu & Smith, 2023), the psychological burden following surgery not only affects the mental health of patients but also has a profound impact on their cardiovascular health, as stress and anxiety contribute to increased inflammatory markers that can impair cardiac healing. In addition to the aforementioned studies, a recent study by Doering et al. (2016) revealed that postoperative depression and anxiety significantly delay recovery and are associated with increased hospital stay durations.

India has become a preferred destination for Yemeni cardiac patients due to affordability, advanced technologies, and the reputation of high surgical success rates (Hedayat, 2006).

Yet, behind these logistical achievements lies an understudied dimension—the psychological toll of traveling across borders for complex heart surgeries.

The stress experienced by patients encompasses more than surgical anxiety. Language barriers, fear of miscommunication, financial distress, and cultural isolation significantly contribute to pre- and post-operative psychological distress (Ali-Khan et al., 2018).

Yemeni patients often navigate these systems without mental health guidance, and in many cases, without family accompaniment. The absence of culturally sensitive psychosocial support significantly heightens distress, exacerbating fear, depression, and surgical anxiety, which can lead to poorer clinical outcomes, including delayed wound healing and increased pain (McCann et al. 2023; Schippert, et al., 2025).

This study therefore aims to address that gap by assessing emotional patterns in Yemeni patients who underwent cardiac surgery in India, evaluating key psychological variables and the role of support mechanisms. Additionally, the study described the changes in

anxiety, depression and satisfaction of Quality of Life during preoperative and postoperative cardiac surgery.

Materials and Methods:

This is a retrospective, cross-sectional study using mixed methods: qualitative interviews and quantitative psychometric tools.

The sample included 150 Yemeni cardiac patients (105 males, 45 females), aged 18–75 years, treated in India during the years 2020 and 2024. Patients were recruited via the Yemeni Medical Attaché in Mumbai and three cardiac centres in New Delhi, Mumbai, and Hyderabad. The following instruments were used: Beck Depression Inventory (Beck et al., 1961), Hospital Anxiety & Depression Scale (Bjelland et al. 2002) and WHO (WHO, 1994).

The collected data were gender, age, close-relatives, type of cardiac surgery, treated centres, accompanied person, psychological states in pre- and post-operative cardiac surgeries, (Anxiety, depression and satisfaction). Statistical analyses were performed using the Excel program. Mean value was used for continuous variables, while numbers and percentages were used to show categorical data.

Results:

During the period 2020 and 2024, the researchers randomly selected 150 Yemeni cardiac patients treated in India. They were 105 (70%) males and 45 (30%) females with ratio male to female 2.33:1. The mean age of all patients was 52 years, ranging (18– 75) years. All variables are illustrated in Table 1 and Figure 1.

Most patients 120 (80%) travelled with close relatives, while those with non-close relative were 30 (20%).

Patients who underwent CABG represented the higher number of patients 84 (56%), followed by valve replacement, 42 (28%), and both CABG + valve replacement with 24 (16%). See Table 1, Figure 2.

Table 1: Characterization of patients under study (n=150)

Variable	No	(%)	Range + Mean
Gender:			
Males	105	(70.0)	
Females	45	(30.0)	
Age (years):			
Age range			18 - 75
Mean Age			52.3
Accompaniment:			
- By Close Relative	120	(80.00)	
- By Non-Close Relative	30	(20.00)	
Cardiac Surgery:			
CABG	84	(56.00)	
Valve Replacement	42	(28.00)	
Both CABG + Valve Replacement	24	(16.00)	
Treated Centres:			
- Mumbai Cardiac Centre	102	(68.00)	
- New Delhi and Hyderabad Centres	48	(32.00)	

CABG = Coronary Artery Bypass Grafting

Figure 1: Proportions of patients under study related to sex

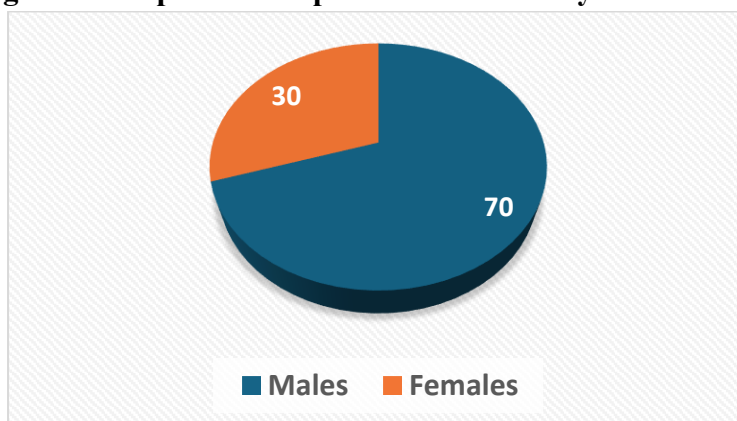


Figure 2: Proportions of cardiac surgery of the patients under study

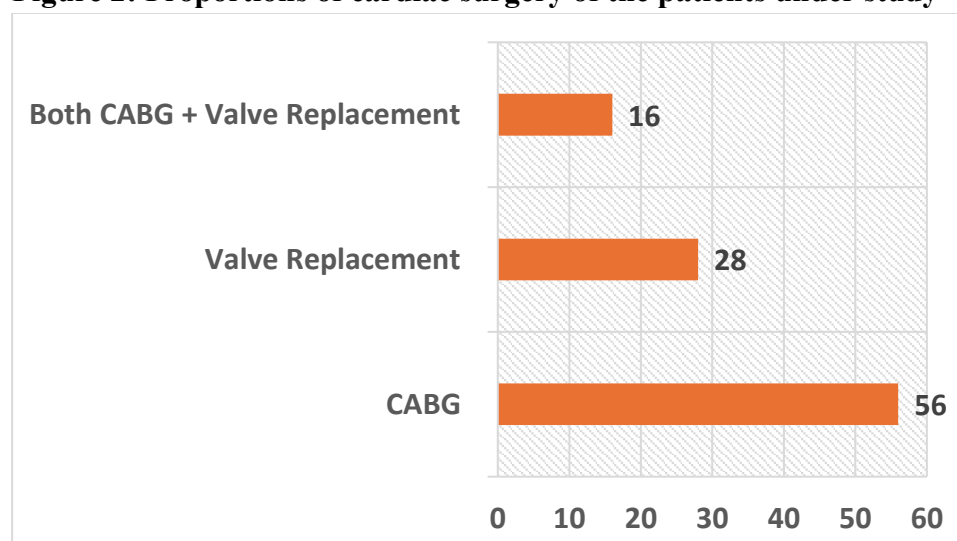


Table 2 & Figure 3 summarized the psychological states in pre- and post-operative cardiac surgeries. Moderate-Severe Anxiety was represented in 122 (81.3%) patients during the period of preoperative cardiac surgery and decreased to 44 (29.3%) in the period of postoperative cardiac surgery. Moderate Severe Depression was in 88 (58.7%) patients in the preoperative procedures and decreased to 33 (22%) in postoperative period. High satisfaction QoL found in 35 (23.3%) patients in preoperative cardiac surgery and increased to 111 (74%) in postoperative period.

Table 2: Psychological States: Pre- and Post-Operative cardiac surgeries

Variables	Pre-operative		Post-operative	
	No	(%)	No	(%)
Moderate-Severe Anxiety	122	(81.3)	44	(29.3)
Moderate-Severe Depression	88	(58.7)	33	(22.0)
High Satisfaction (QoL)	35	(23.3)	111	(74%)

QoL = Quality of Life

Figure 3: Psychological States: Pre- and Post-Operative cardiac surgeries

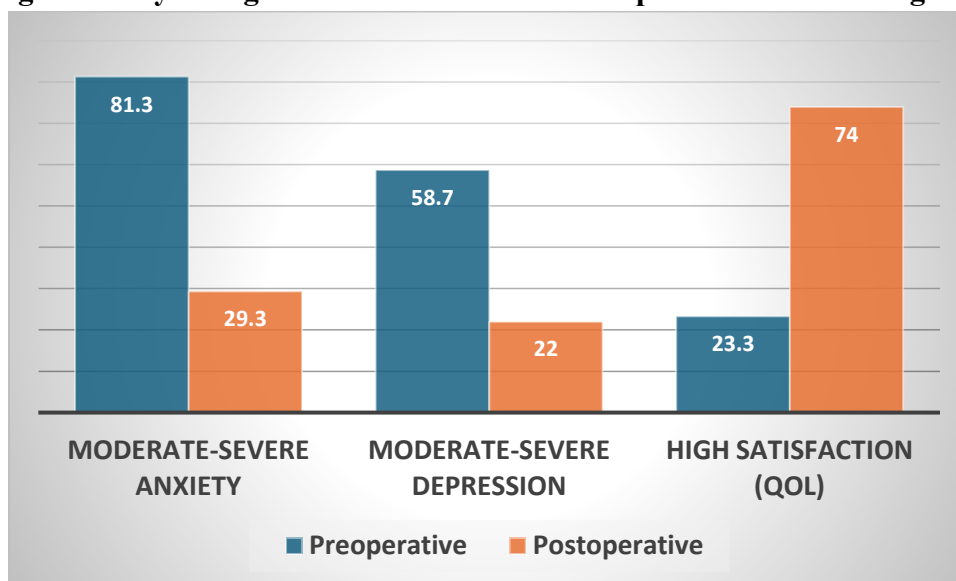


Table 3 & Figure 4 showed the reduction in anxiety across surgery types. In cardiac surgery, CABG the preoperative anxiety which was represented by 118 (79%) decreased to 42 (28%). In valve replacement, the preoperative anxiety was in 123 (82%) and decreased to 45 (30%) In both CABG and valve replacement the anxiety was in 132 (88%) and decreased to 53 (35%).

Table 3: Reduction in anxiety across surgery types.

Surgery Type	Pre-op Anxiety		Post-op Anxiety	
CABG	118	(79)	42	(28)
Valve Replacement	123	(82)	45	(30)
Both CABG + Valve	132	(88)	53	(35)

CABG = Coronary Artery Bypass Grafting

Figure 4: Anxiety Reduction by Surgery Type

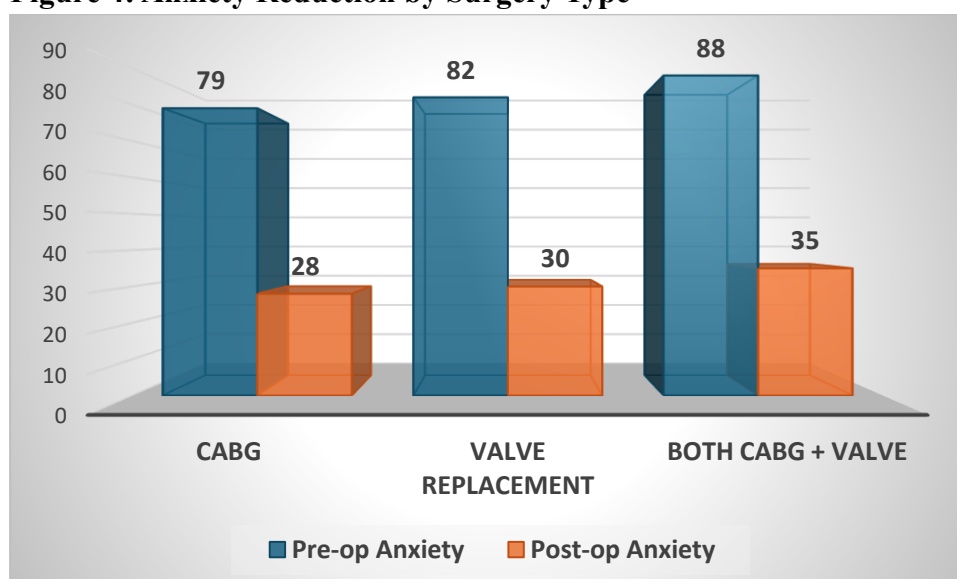


Table 4 and Figure 5 showed occurrence of depression in patients who underwent cardiac surgeries during the period of preoperative period and their reduction postoperative surgeries. Depression in preoperative both CABG + Valve Replacement were found in 98 (65.3%) patients followed by depression in preoperative valve replacement 92 (61%) than in preoperative CABG 86 (57.3%). In the postoperative period, depression reduction occurred in both CABG + Valve Replacement to 39 (26%), in valve replacement to 35 (23.3%) and in CABG 32 (21.3%).

Table 4: Reduction in depression across surgery types

Surgery Type	Pre-op Depression	Post-op Depression
CABG	86 (57.3)	32 (21.3)
Valve Replacement	92 (61.0)	35 (23.3)
Both CABG + Valve Replacement	98 (65.3)	39 (26)%

Figure 5: Reduction in depression across surgery types.

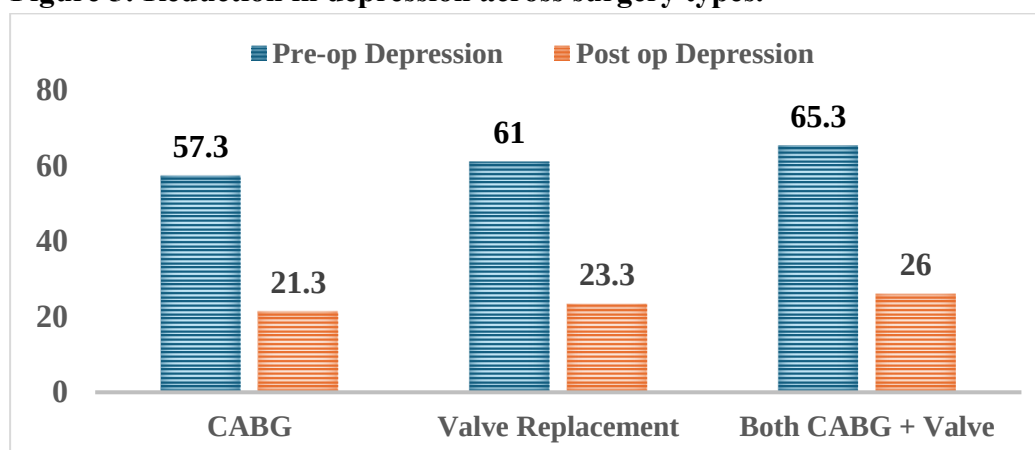


Table 5 & Figures 6 + 7 revealed the postoperative quality of life by accompaniment type (Close relative and Non-Close Relative). Satisfaction of High QoL in postoperative period among patients accompanied with close relative was in 94 (78%) and acceptable satisfaction QoL were in 26 (22%) patients. In patients with non-relative accompanied satisfaction of High QoL were 17 (56.7%) and acceptable satisfaction QoL were in 13 (43.3%).

Table 5: Post-operative quality of life based on accompaniment of close-relative and non-close relative.

Accompaniment	No patients	Post-operative Satisfaction (QoL)
Close Relative:		
Satisfaction of High QoL	94	78.0
Acceptable satisfaction QoL	26	22.0
Sub-total	120	100.0
Non-Close Relative:		
Satisfaction of High QoL	17	56.7
Acceptable satisfaction QoL	13	43.3
Sub-total	20	100.0

QoL = Quality of Life

Figure 6: Post-operative quality of life based on accompaniment of Close Relative

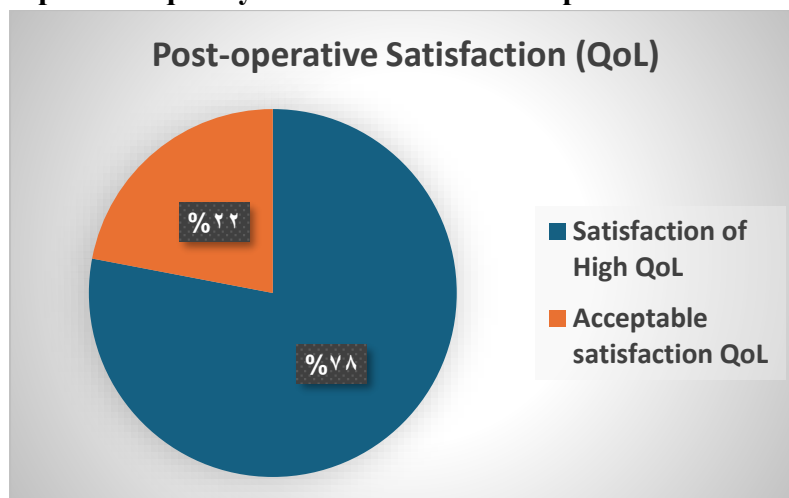


Figure 7: Post-operative quality of life based on accompaniment of Non-Close Relative



Discussion

This study highlights the dual nature of medical services providing access to advanced care while imposing substantial psychological and social challenges. Preoperative anxiety and depression were common, particularly among those undergoing complex surgeries and unaccompanied patients. The findings reinforce that cardiac patients experience significant pre-operative psychological distress, consistent with prior studies (Vu T & Smith, 2023; Hedayat et al., 2006). Yemeni patients face added challenges from cultural displacement and political instability (Kangas, 2010).

Patients who travelled with close relatives or benefited from interpreter services showed markedly better emotional recovery, highlighting the critical role of social support networks in mitigating anxiety and depression (Chen et al., 2024).

The findings of previous studies demonstrated that psychosocial preparation and the relative communication buffer against pre-operative stress in cardiac surgery (Leivaditis et al., 2025). Therefore, cardiac surgery is a stressful life event associated with physical and psychological impairments such as anxiety, fear, depression, and pain (Feuchtinger et al., 2014).

In our present study, the number of male patients were (70%) and the female patients were (30%) with ratio male to female 2.33:1.

This finding of cardiac surgical patients reflects a common pattern where males are more prevalent, similar to finding of (78.6%) men and (21.4%) women (Matyal et al., 2021). This gender distribution is consistent with higher reported rates of cardiac procedures, such as CABG, in men, while female patients often present at a more advanced age with greater comorbidity risks (Harik et al., 2023).

Our current study highlights a high prevalence of CABG among cardiac surgical patients (56%), with a smaller proportion requiring valve replacement (28%) or combined CABG + valve procedures (16%).

Kobayashi et al. (2009) reported that patients who undergo combined coronary artery bypass grafting (CABG) and aortic valve replacement surgery are considered at higher operative risk. However, this procedure is currently the third most frequently performed cardiac surgery behind isolated CABG and aortic valve replacement.

Coronary artery bypass grafting (CABG) remains the most common treatment for advanced coronary artery disease, the leading cause of morbidity and mortality globally (Pačarić et al., 2020).

In our current study, moderate-severe anxiety represented in (81.3%) patients during the period of preoperative cardiac surgery and decreased to (29.3%) in the period of postoperative cardiac surgery.

Mudgalkar et al. (2022) reported in their published study that preoperative anxiety is a typical occurrence that can harm a variety of perioperative parameters. They added that, their study corroborates with the findings of previous studies that anxiety is common among cardiac surgery patients (Tully et al., 2012). Additionally, they mentioned that almost every patient in their study was anxious about surgery, with the incidence of moderate and severe anxiety is nearly 92%.

This study found that moderate severe depression was (58.7%) in cardiac patients before the cardiac surgery and decreased to (22%) in postoperative period. These findings indicate a significant, positive, and rapid reduction in depression (from 58.7% to 22%) among cardiac patients following surgery. This suggests that for many, surgical resolution of physical cardiac symptoms acts as a powerful intervention, improving mental health and reducing preoperative distress. Surgical patients, particularly those undergoing major procedures, are at increased risk of experiencing depression (Wang et al., 20022; Verdonk et al., 2024).

The current study revealed high satisfaction quality of life in (23.3%) patients in preoperative cardiac surgery and increased to (74%) in postoperative period. Cardiac surgery aims to alleviate physical symptoms, prolong life and improve quality-of-life. Patients' preoperative concerns, expectations of the impact of surgery, anticipated timeline of recovery, and pre- and postoperative education affect recovery and health-related quality-of-life following cardiac surgery (Holmes et al., 2016; Levett et al., 2019).

In the current study, we found the preoperative anxiety in patients undergoing CABG was (79%) and decreased to (28%), while in patients undergoing valve replacement the preoperative anxiety, it was (82%) and decreased to (30%). In both CABG and valve replacement the anxiety was in (88%) and decreased to (35%).

Anxiety is defined as a negative or life-threatening emotion that one feels generally in the long-term or in a specific situation, that fluctuates over time (Fathi et al., 2014). Surgery and hospitalization are considered to be major life challenges, causing anxiety regardless of the type of surgery and disease (Nigussie et al., 2014).

Heightened anxiety has been linked to post-operative pain, impaired quality of life, and increased morbidity and mortality (Navarro-García et al., 2011; Tully et al., 2008).

The reported incidence of preoperative anxiety ranges from 60-92% in unselected surgical groups and is higher in females (Perks et al., 2009; Frazier et al. 2003).

Nigussie et al. in 2012 found a significant rate of preoperative anxiety (70.3%) among surgical patients (Nigussie et al., 2014).

Prevalence of anxiety is probably higher in cardiac surgical patients while on the waiting list (Koivula M, Tarkka et al., 2002).

Combined surgical procedures (CABG + Valve Replacement) were associated with the highest levels of pre-operative anxiety and depression. This suggests that more complex surgeries require targeted psychological interventions before travel (Ali-Khan et al., 2018; Hanefeld et al., 2013)].

Elderly patients and female participants exhibited higher emotional vulnerability. Interviews revealed that isolation, fear of miscommunication, and existential concerns were prominent. Tailored pre-surgical briefings and culturally sensitive support could alleviate these issues (Snyder et al. 2011).

The Yemeni Medical Attaché played a vital role beyond logistics, offering guidance, coordination, and emotional reassurance. Their involvement significantly influenced patient trust and emotional preparedness (Saleh et al. 2019; Turner, 2012).

In the present study, we found depression in preoperative both CABG + Valve Replacement were found in (65.3%) patients followed by depression in preoperative valve replacement (61%) than in preoperative CABG (57.3%).

Preoperative depression is highly prevalent in cardiac patients, with studies showing that it affects up to 40% or more of those undergoing surgery.

Data indicates high rates of pre-operative depression in CABG patients (range 14–60%), while combined procedures (CABG + Valve) pose even higher risks, echoing findings that preoperative depression acts as an independent risk factor for poor outcomes, linked to increased cardiovascular mortality, morbidity, and poorer quality of life (AbuRuz & Al-Dweik , 2022).

In the postoperative period depression reduction occurred in both CABG + Valve Replacement to (26%), in valve replacement to (23.3%) and in CABG (21.3%).

Postoperative depression impacts a significant portion of cardiac surgery patients, with studies showing prevalence rates often exceeding 20%–35%. While depression rates can decrease after rehabilitation, post-surgical depression remains common across procedures like CABG alone, valve replacement, or combined procedures, often peaking in the weeks following surgery (Tully & Baker, 2012).

Lastly, post-operative satisfaction and perceived quality of life were closely tied to emotional resilience, family support, and positive hospital interactions, emphasizing the holistic nature of recovery (Tyagi & Mehra, 2025).

A significant reduction in anxiety and depression was observed post-surgery. Quality of life scores improved markedly, demonstrating psychological recovery alongside physical healing.

Furthermore, our data supports the growing body of evidence suggesting that family accompaniment serves as a critical protective factor against psychological distress in medical tourism contexts. This finding is particularly relevant given the unique cultural and social dynamics of Yemeni patients seeking care abroad during ongoing conflict.

Previous studies reported that most cardiac patients travelled abroad for heart treatment with close relatives (Chow, 2007).

In our present study, 80% of cardiac patients travel abroad for treatment with close relatives, while 20% travel with non-close relatives. This finding suggests that the vast majority of patients seeking foreign care for cardiac conditions are accompanied by close family members.

Furthermore, the integration of artificial intelligence-powered translation services and cultural liaison programs has shown remarkable success in reducing communication barriers and cultural stress among international patients. The European Medical Tourism Alliance's recent implementation study across 15 hospitals reported a 67% reduction in patient-reported communication difficulties and a 41% improvement in cultural comfort scores when AI-assisted interpretation was combined with trained cultural mediators (Eur J Med Tourism, 2024).

Conclusion

The researchers concluded that the relationship between psychosocial factors, family support versus the preoperative status of the patients plus postoperative outcomes are essential to achieving optimal outcomes in cardiac surgery.

Therefore, our study on Yemeni patients treated in India suggests that the assessment of psychosocial factors, particularly anxiety, depression, satisfaction of quality of life in pre and postoperative cardiac surgery differ in their outcomes between the different types of cardiac surgery, additionally between patients accompanied with close-relative and non-close relative

Recommendations

1. Mandatory psychosocial briefings before departure, conducted by the Yemeni Medical Attaché, including coping strategies and language support guidance.
2. Integration of interpreters and mental health professionals in Indian hospitals treating international patients.
3. Post-operative psychological follow-up via virtual sessions during the recovery phase.
4. Development of culturally tailored patient care programs in coordination with Middle Eastern embassies.
5. Financial support for family accompaniment, particularly for elderly or vulnerable patients.

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