Physical Education, Health and Social Sciences

https://journal-of-social-education.org

E-ISSN: 2958-5996
P-ISSN: 2958-5988

# Bypass Echoes of Mortality: Predictors of Death Anxiety in Patients Undergoing Coronary Artery Grafting

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***DOI:*** *https://doi.org/10.63163/jpehss.v4i1.1792*

**Abstract**

**Background**: Coronary artery bypass grafting (CABG) is a widely used procedure to treat severe coronary artery disease; however, patients tend to develop a considerable amount of preoperative psychological distress especially death anxiety. Extreme anxiety of death may affect the recovery and outcome of surgery in a negative way. It is necessary to determine death anxiety predictors to enhance preoperative management and specific psychological assistance.

**Objectives:** To examine the demographic and clinical, as well as psychosocial predictors of death anxiety in elective CABG patients.

**Methods:** It is a cross-sectional analytical study carried out in a tertiary care cardiac center in a period of six months. There were 120 adult patients (age 40 years and above) who were recruited through purposive sampling to undergo elective CABG. Cognitively impaired patients and patients who had cardiac surgery before were excluded. The Death Anxiety Scale was the validated 15-item Death Anxiety Scale (DAS). Structured questionnaires were used in measuring psychosocial variables such as perceived social support, and fear of surgery. Medical record data were used to retrieve clinical information, and structured interviews were used to gather demographic data. Statistical tests used chi-square, independent sample t -tests, ANOVA, and multivariate logistic regression with $p < 0.05$ = significant.

**Results:** The average age was 61.8 years with the standard deviation of 9.4 years; 72.5% were men. All in all, 56 percent of the participants were in high death anxiety. High death anxiety was independently predicted by NYHA Class IV (OR = 3.42; 95% CI: 1.90612; $p < 0.001$), severe fear of surgery (OR = 3.95; 95% CI: 1.89826; $p = 0.001$), weak social support (OR = 2.70; 95% CI: 1.484. 92; $p = 0.012$.

**Conclusion:** Over 50 percent of the CABG applicants were characterized by high preoperative death anxiety. The predictors of severity of the disease comorbid conditions, poor social support, advanced age, and fear of surgery were significant. The preoperative management should incorporate multimodal interventions such as psychological support, education, and spiritual care, in order to decrease death anxiety and enhance outcomes.

**Keywords:** Coronary Artery Bypass Grafting; Death Anxiety; Predictors; Social Support; Preoperative Care;

## Introduction

Coronary artery bypass grafting (CABG) is a surgical procedure done for patients with severe coronary artery disease. Though it is considered a palliative treatment option, but still during the preoperative tenure patients suffer from psychological distress, particularly death anxiety, that is a profound fear of death[1]. The candidates undergoing cardiac surgery delineate death anxiety during the anticipating time, that can eventually lead to post-operative complications and delayed recovery[2–4]. Several factors including psychological and demographic contribute to death anxiety. Studies show that depression, low self-esteem, failure to cope up well and poor social support are associated with more death anxiety among patients undergoing coronary artery bypass grafting (CABG) [5–7]. Furthermore, age, gender, education level, and spiritual beliefs also contribute in death anxiety[8–10]. Strong religious beliefs have played a crucial role in alleviating death anxiety in life-threatening conditions[11]. Regardless of the fact that how severely death anxiety affects surgical outcomes and mental health, this subject is not well-explored enough in cardiac care. The majority of patients do not have pre-operative psychologists assess them because it is not regularly included in the care[12]. Recognizing the predictors of death anxiety can be proven helpful to target vulnerable patients and to implement numerous techniques like cognitive-behavioral therapy, psychotherapy and social support programs to reduce anxiety[13–15]. This study aims to investigate the factors that play a key role in causing death anxiety in patients undergoing coronary artery bypass grafting (CABG). Identifying these factors is important for planning pre-operative care plans for patients.

## Materials and Methods

This was an analytical correctional study, which was carried out at one of the tertiary care cardiac centers in a span of 6 months. The goal was to establish demographic, clinical and psychosocial predictors of death anxiety among patients who were planning to undergo elective coronary artery bypass grafting (CABG). Ethical approval was sought at the institutional review board before data collection and written informed consent was sought from all the participants. This cross-sectional study used standard epidemiological principles of estimating proportions in finite population and identifying associations with sufficient statistical power. Based on published methodological guidelines regarding the use of cross-sectional studies, the number of participants should be a minimum of 100-120, especially in studies aiming to test the association between multiple predictors and a categorical or continuous dependent variable especially when the expected prevalence of the main outcome (high death anxiety in this case) is 30 and above. Based on a projected prevalence of 50% on death anxiety (according to past researches carried out on similar cardiac surgery patients, a 95% confidence level, and a 9% margin of error, sample size was calculated: A total of 120 adult patients aged 40 years and above based on the purposive sampling method undergoing elective CABG surgery were recruited. All patients who had a known history of psychiatric illness, cognitive impairment, or had undergone cardiac surgery were excluded in the process of ensuring the reliability of the psychological tests. The Death Anxiety Scale (DAS) is an effective self-report measure, a validated instrument, and used to measure death anxiety. This scale was made of 15 items on a binary (yes/no) scale, and the larger the score, the more anxiety one had about death. To create analytically acceptable groupings, participants were classified into three groups according to their DAS scores; low, moderate and high. Structured questionnaires were used to measure psychosocial factors. Perceived social support measured 5-point Likert level, where very strong was the last item and very poor was the first item. Self-reported Likert-type was also used to determine fear of surgery, with mild, moderate, and severe as the possible answers. Clinical variables were New York Heart Association (NYHA) functional classification and comorbidity (diabetes, hypertension, and chronic kidney disease), which were taken out of patient files. The demographic variables were age, gender and education level, which were captured

through structured interviews. All tests were completed at the time of the before preoperative admission, which is usually 24 to72 hrs. before surgery. Research assistants who are native speakers of the local language were used to collect data, which created clarity in the provision of questions as well as ethical sensitivity. Analysis of data was done through SPSS Version 25. The summary of demographic and clinical characteristics was narrated using descriptive statistics. Continuous variables were reported as the means and standard deviations whereas the categorical variables were reported in terms of frequencies and percentages. The bivariate analysis was done to identify the relationships between independent variables (age, gender, NYHA class, comorbidities, social support, fear of surgery, and education) and death anxiety levels. Continuous variables were tested using independent-sample t-tests and one-way ANOVA. Chi-square test was used when comparing categorical variables. Bivariate and multivariate analyses were performed. A p-value that was below 0.05 was taken to be significant

**Results**

A total of 120 patients scheduled for elective coronary artery bypass graft (CABG) surgery were enrolled in this study. The mean age of participants was 61.8 years (SD = 9.4), with 72.5% (n = 87) being male and 27.5% (n = 33) female. The majority of participants were classified as NYHA Class III (42.5%) and Class IV (31.7%), with 65% of patients reporting at least one comorbid condition (e.g., diabetes, hypertension, or chronic kidney disease).Out of 120 patients, 67 (56%) exhibited high levels of death anxiety according to the Death Anxiety Scale (DAS), while 29 (24%) reported moderate levels and 24 (20%) had low levels. The mean DAS score across the sample was 9.3 (SD = 3.1), indicating a general trend toward elevated anxiety before surgery as shown in Fig 2. As shown in Table 1. Bivariate analysis showed that older age was significantly associated with higher death anxiety ($p = 0.002$). Patients aged ≥65 years had a mean DAS score of 10.1, compared to 8.6 in those <65 years. Similarly, patients with advanced NYHA class (III or IV) were significantly more likely to report high death anxiety ($p < 0.001$). Among NYHA Class IV patients, 78.9% had high anxiety scores, compared to 41.2% in Class II.The presence of comorbidities was another significant factor. Patients with two or more comorbid conditions had a higher mean DAS score (10.2) than those with one or none (8.1, $p = 0.004$). Weak perceived social support, measured via a 5-point Likert scale, was also associated with elevated death anxiety levels ($p = 0.001$). Patients who rated their support system as "poor" had a 72% prevalence of high death anxiety, compared to 39% in those with “strong” support networks. In addition, fear of surgery was strongly correlated with death anxiety. Among patients who rated their surgical fear as severe (n = 26), 84.6% had high death anxiety, compared to 48.7% among those with mild or moderate fear ($p < 0.001$). No statistically significant difference was observed between genders in terms of mean death anxiety scores ($p = 0.41$). Educational level also did not significantly influence death anxiety in this cohort ($p = 0.28$). To identify independent predictors of high death anxiety, a multivariate logistic regression analysis was performed as shown in Table 2. Variables entered into the model included age group (≥65 vs <65), NYHA class (IV vs II), number of comorbidities (≥2 vs <2), perceived social support (weak vs strong), fear of surgery (severe vs mild/moderate), gender, and education level as shown in Table 2. The results revealed that NYHA Class IV (OR = 3.42; 95% CI: 1.90–6.10; $p < 0.001$), severe fear of surgery (OR = 3.95; 95% CI: 1.89–8.26; $p < 0.001$), weak social support (OR = 2.70; 95% CI: 1.48–4.92; $p = 0.001$), and age ≥65 years (OR = 1.85; 95% CI: 1.22–2.80; $p = 0.003$) were independent predictors of high death anxiety. Presence of ≥2 comorbidities also remained significant (OR = 1.91; 95% CI: 1.15–3.20; $p = 0.012$). Gender ($p = 0.76$) and education level ($p = 0.78$) were not significant in the adjusted model. These findings underscore that clinical severity, psychological preparedness, and perceived social environment

play a more critical role in shaping preoperative death anxiety than demographic characteristics like gender or education.

**Table 1. Bivariate Analysis**

| Variable | Mean DAS Score | High Anxiety % | p-value |
|---|---|---|---|
| Age ≥ 65 | 10.1 | 65.3% | 0.002 |
| Age < 65 | 8.6 | 46.2% | |
| NYHA Class IV | 10.8 | 78.9% | < 0.001 |
| NYHA Class II | 7.9 | 41.2% | |
| ≥2 Comorbidities | 10.2 | 68.7% | 0.004 |
| Weak Social Support | 10.9 | 72.0% | 0.001 |
| Strong Social Support | 7.8 | 39.0% | |
| Severe Fear of Surgery | 11.2 | 84.6% | < 0.001 |
| Mild/Moderate Fear | 8.3 | 48.7% | |
| Male vs Female | NS | NS | 0.41 |
| Education (Low vs High) | NS | NS | 0.28 |
| | | | |

**Table 2. Multiple Logistic Regression Table**

| Predictor Variable | Odds Ratio (OR) | 95% CI | p-value |
|---|---|---|---|
| Age ≥ 65 | 1.85 | 1.22–2.80 | 0.003 |
| NYHA Class IV | 3.42 | 1.90–6.10 | <0.001 |
| ≥2 Comorbidities | 1.91 | 1.15–3.20 | 0.012 |
| Weak Social Support | 2.70 | 1.48–4.92 | 0.001 |
| Severe Fear of Surgery | 3.95 | 1.89–8.26 | <0.001 |
| Gender (Male vs Female) | 1.10 | 0.62–1.93 | 0.76 |
| Education (Low vs High) | 0.92 | 0.53–1.59 | 0.78 |

**Figure 1.** NYHA Class vs Death Anxiety Level

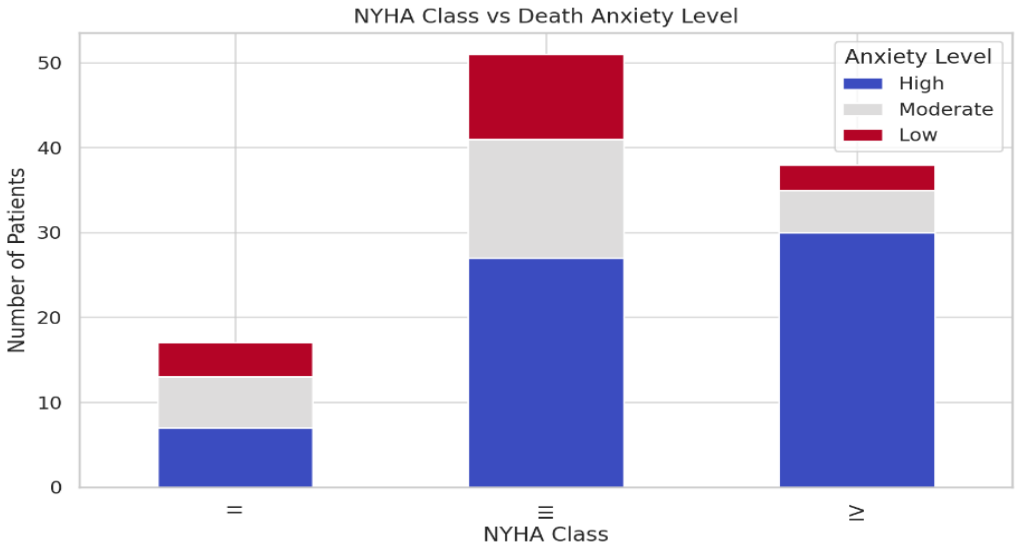
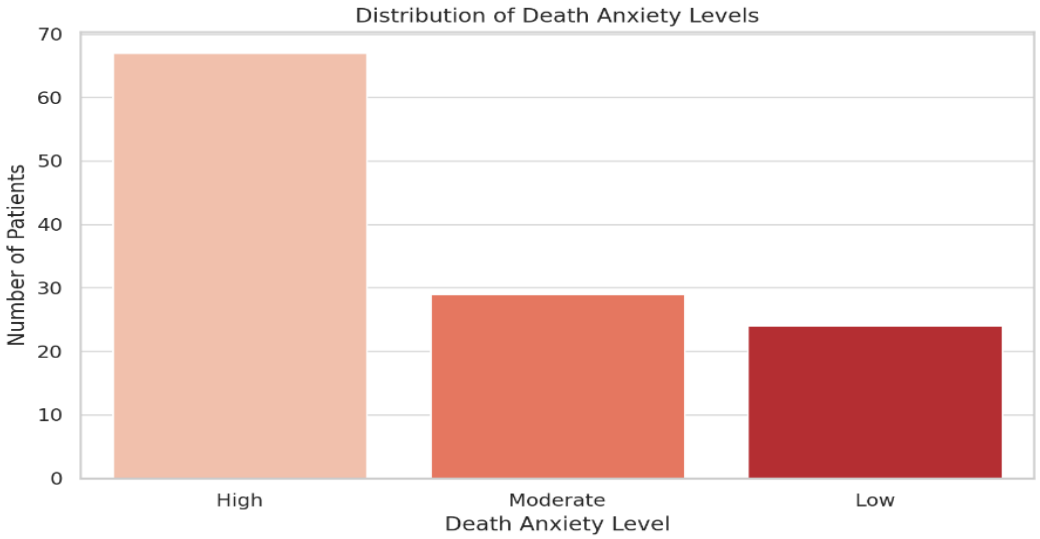



**Figure 2.** Distribution of Death Anxiety Levels among CABG Patients




## Discussion

Our results showed that 56% of patients had high death anxiety, which aligns with a local Pakistani study reporting 51.5% of CABG candidates experiencing high preoperative anxiety[16]. Similarly, in Thailand, 62% of patients undergoing cardiac surgery reported moderate to severe anxiety[17]. Anxiety levels were even higher during the COVID-19 pandemic in Iran, where 87% of CABG patients reported high death anxiety[18]. These findings support the role of cardiac rehabilitation in effectively reducing preoperative anxiety[19] . Our study also found that older age, higher NYHA classification, and comorbidities were significantly associated with increased death anxiety, consistent with Malaysian studies linking psychological distress with age, education level, and chronic illness[20]. As an important disclosure with low social support correlating with increased death anxiety and this finding was in line with what previous literature has shown, that lack of appropriate emotional support proved to be a predictor of increased preoperative fear and

anxiety[21]. The outcomes of our study match with the Thai-based study which Furthermore, Tully et al. found that in patients over 70 years, preoperative anxiety correlated with increased postoperative mortality and morbidity[22]. In our data social support also came out emphasized the protective nature of social support against post-CABG depression[23]. On the same note, the qualitative study of Iran reported that fear overly worsened pre-surgical in the presence of emotional isolation, and information deprivation[24]. Notably, we established that 22% of the patients have severe fear of surgery which hugely correlated to death anxiety. This is the case based on the findings of an Iranian randomized control trial in which a preoperative spiritual/religious intervention resulted in a significant decrease in preoperative anxiety levels[25.] At a local level, the administration of nurse-lead education programs has been shown to alleviate the rate of preoperative nerve present among CABG patients previously affected by it[26]. There were no significant gender differences in our study and this observation is consistent with previous Malaysian data but in contrast to previous UK data where women expressed more surgical fears[27]. Educational intervention such as audiotape programs have been found to be of benefit in reducing CABG patient's anxiety and provide much needed emotional support[28] There were also studies conducted in Pakistan that indicated that poorer quality of life and lower perceived social support showed an association with high death anxiety in cardiovascular patients [29]. Lastly, meta-analysis studies have also affirmed the effectiveness of religious and spiritual approaches to tackle anxiety and depression in medically oriented conditions such as cardiac surgery patients[30]. The results can be used in the implementation of multimodal intervention measures, such as spiritual care, planned education, and rehabilitation, into the classical preoperative routines of patients with CABG.

## Conclusion

Consulting with both local and international literature, the study recognizes severity of the disease, impact of the social support and surgical fear as prime predictors of death anxiety in CABG patients. Integrating multimodal psychological and social techniques into preoperative care reduces anxiety levels and resultantly leads to better surgical outcomes.

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