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RESEARCH ARTICLES

The relationship between respiratory symptoms and psychological state: a perspective on kinesiophobia and cardiac anxiety

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ABSTRACT

Aim: This study investigated the relationship between kinesiophobia, cardiac anxiety, and dyspnea symptoms in patients undergoing coronary artery bypass graft (CABG) surgery.

Materials and Methods: A descriptive cross-sectional study was conducted with 84 patients at a tertiary care facility over a 15-month period from December 2023 to March 2025. The study population included adult patients (≥18 years) who underwent elective CABG and remained hospitalized for 3 to 5 days postoperatively. Data were collected using the Cardiac Anxiety Questionnaire (CAQ) and the Tampa Scale for Kinesiophobia (TSK), alongside demographic and clinical assessments of pain, fatigue, and dyspnea.

Results: Data analysis revealed a significant positive correlation between kinesiophobia and cardiac anxiety (r=0.602, p=0.01), suggesting that these psychological barriers frequently coexist post-surgery. Participants with higher levels of kinesiophobia exhibited significantly higher cardiac anxiety. However, kinesiophobia was not correlated with pain (r=0.161, p=0.142) or dyspnea (r=-0.010, p=0.924). Regression modeling demonstrated that cardiac anxiety was the sole independent predictor of kinesiophobia, accounting for 23% of the total variance (p=0.001). Other variables, including age, weight, smoking status, and dyspnea, were not significant predictors.

Conclusion: Our findings suggest that cardiac anxiety is a primary driver of kinesiophobia following cardiac surgery. These results underscore the necessity for healthcare providers to conduct multidisciplinary assessments of physical, mental, and respiratory status during cardiac rehabilitation to optimize patient outcomes.

Keywords: anxiety disorders, dyspnea, fear, pain, psychological distress

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INTRODUCTION

Coronary artery disease (CAD) remains a leading cause of morbidity and mortality globally (1). Coronary Artery Bypass Grafting (CABG) is one of the most common surgical interventions, aimed at enhancing cardiac output and improving survival rates (2). However, patients often face barriers to functional recovery due to postoperative physical and emotional effects. Symptoms such as fatigue, discomfort, and dyspnea may impede rehabilitation, often due to a fear of re-injury associated with physical movement (3).

Dyspnea is a complex perception influenced by both physiological and psychological variables (4). Although it may not always stem from a primary respiratory etiology, postoperative dyspnea in CAD patients remains a critical metric for pulmonary evaluation. Anxiety-related dyspnea may lead patients to misinterpret physical sensations, thereby exacerbating perceived respiratory distress (5). Consequently, differentiating between cardiac and pulmonary symptoms is essential in patients presenting with comorbid conditions.

Dyspnea is frequently associated with psychological distress and the avoidance of movement due to fear, known as kinesiophobia (6,7). Anticipation of symptoms or fear of breathlessness can trigger cardiac-related stress, which subsequently restricts daily activity and reduces overall physical capacity (8). This pattern is prevalent in cardiovascular patients and has also been observed in populations with COPD or interstitial lung diseases (9,10).

In this context, the correlation between patient-perceived dyspnea and physical inactivity necessitates a multidisciplinary approach. This study aimed to investigate the relationship between kinesiophobia, cardiac anxiety, and dyspnea in CAD patients. Our preliminary observations suggest a direct correlation between kinesiophobia and cardiac anxiety levels. Furthermore, the degree of anxiety appears to vary significantly based on the level of kinesiophobia. These data emphasize the importance of integrated assessments involving psychological, respiratory, and physical symptomatology, highlighting the integral role of pulmonologists in the postoperative recovery process.

METHODS

Study design and participants

This study utilized a descriptive cross-sectional design. The study population comprised 84 patients admitted to the Bolu Abant İzzet Baysal University, İzzet Baysal Training and Research Hospital between December 2023 and March 2025.

Inclusion criteria were:

- Age ≥18 years,
- Undergoing elective CABG surgery,
- Hospitalization for 3–5 days post-surgery,
- Provision of verbal and written informed consent.

Exclusion criteria included cognitive impairment, speech disorders, pre-existing psychiatric diagnoses, or a requirement for mechanical ventilation. Cognitive status was assessed by the attending physician through clinical evaluation of orientation, memory, and the ability to follow instructions.

Data collection tools

Data collection included demographic variables (age, height, weight, education, smoking status, comorbidities, and exercise habits), symptomatic conditions (pain, fatigue, and dyspnea), and psychological assessments.

The Cardiac Anxiety Questionnaire (CAQ) is a self-report instrument developed by Eifert et al. to evaluate heart-related fear, attention to symptoms, and avoidance behaviors (11). Items are scored from 0 (none) to 4 (very high), with higher total scores indicating greater cardiac anxiety. The Turkish version has demonstrated validity and reliability across various cardiac populations (12).

The Tampa Scale for Kinesiophobia (TSK) evaluates fear of movement or physical activity due to concerns regarding pain or injury. Originally developed by Kori et al., it is widely used in rehabilitation settings (13). The TSK consists of 17 items scored on a 4-point Likert scale (1=strongly disagree, 4=strongly agree). Total scores range from 17 to 68, where higher scores reflect greater kinesiophobia. The Turkish version is a validated tool for assessing activity-related avoidance behaviors (14).

Ethical approval

This study was approved by the Bolu Abant İzzet Baysal University Clinical Research Ethics Committee (Date: 05.12.2023; Decision No: 2023/416). Informed consent was obtained from all participants.

Statistical analysis

Data were analyzed using IBM SPSS Statistics v20.0 (IBM Corp., Armonk, NY, USA). Continuous variables are presented as mean±standard deviation (SD), and categorical variables as frequencies and percentages. Data normality was assessed using the Shapiro–Wilk test. Intergroup comparisons were conducted using independent samples t-tests or the Mann–Whitney U test as appropriate. Differences across kinesiophobia levels (low, medium, and high) were evaluated via the Kruskal–Wallis test with Dunn–Bonferroni post-hoc analysis. Pearson's correlation was used to assess relationships between variables, and multiple linear regression (enter method) was used to identify predictors of kinesiophobia. Significance was set at $p < 0.05$.

RESULTS

Eighty-four patients meeting the inclusion criteria were monitored during the early postoperative period. The mean age was 62.07±8.37 years. Physical characteristics included a mean height of 168.63±7.02 cm and a mean weight of 76.95±13.82 kg. Approximately 30% of participants were active smokers, and 25% reported chronic comorbidities such as diabetes mellitus or hypertension. Postoperative fatigue was the most prevalent symptom. Dyspnea was reported by over 50% of participants, while 30% experienced pain in the early recovery phase. Participants exhibited moderate levels of cardiac anxiety and kinesiophobia, as summarized in Table 1.

Cardiac anxiety demonstrated a significant positive correlation with kinesiophobia (r=0.602, p=0.01). Conversely, no significant correlation was found between kinesiophobia and pain (r=-0.161, p=0.142) or dyspnea (r=-0.010, p=0.924) (Table 2).

Participants were stratified into low, medium, and high kinesiophobia groups (Figure 1). Kruskal–Wallis analysis revealed significant differences in cardiac anxiety scores between groups (p=0.004). Post-hoc testing indicated that the high kinesiophobia group had significantly higher cardiac anxiety compared to other groups.

Table 1. Overview of the sociodemographic and clinical profiles of the participants (n=84)

	Mean	SD	Min	Max	Q1	Q3
Age (year)	62.07	8.37	37	77.0	58.011	68.0
Height (cm)	168.63	7.03	148	181.0	165.0	174.0
Weight (kg)	76.95	13.82	45	135.0	70.75	84.0
BMI (kg/m^2)	27.15	5.26	19.99	46.85	23.77	29.23
CAQ (0-4)	1.97	0.56	0.44	4.25	1.705	2.22
TSK (17-68)	44.79	6.59	32	62.0	40.0	49.0

SD: Standard Deviation, Min: Minimum, Max: Maximum, Q1: 1st Quartile, Q3: 3rd Quartile, BMI: Body Mass Index, CAQ: Cardiac Anxiety Questionnaire, TSK: Tampa Scale for Kinesiophobia.

Table 2. Correlations among key clinical and psychological variables

		CAQ	TSK	Presence of Pain	Presence of Dyspnea
CAQ	p	NA	0.01*	0.112	0.411
	r		0.602	-0.357	-0.189
TSK	p	0.01*	NA	0.142	0.924
	r	0.602		-0.161	-0.01
Presence of Pain	p	0.112	0.142	NA	0,01*
	r	-0.357	-0.161		0,338
Presence of Dyspnea	p	0.411	0.924	0.01*	NA
	r	-0.189	-0.01	0.338	

*p<0.05; r: Pearson correlation coefficient; NA: Not Applicable; CAQ: Cardiac Anxiety Questionnaire; TSK: Tampa Scale for Kinesiophobia.

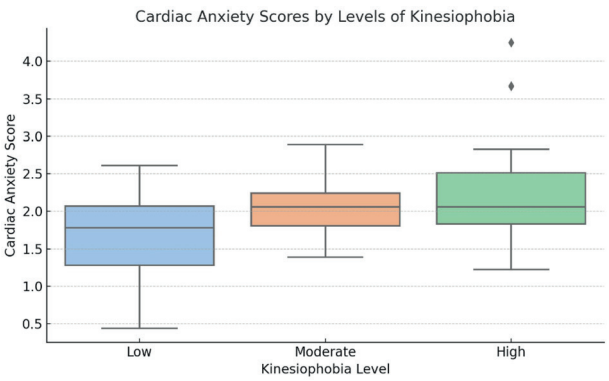

Figure 1. Descriptive statistics of cardiac anxiety scores according to kinesiophobia levels.

Multiple linear regression identified cardiac anxiety as the only significant predictor of kinesiophobia (β=5.37, p=0.001). Variables such as age, weight, smoking status, and dyspnea did not significantly contribute to the model (p>0.05). The model explained 23.1% of the variance in kinesiophobia (R^2=0.231).

DISCUSSION

This study explored the relationships between dyspnea, cardiac anxiety, and kinesiophobia in post-CABG patients. Our findings indicate a strong association between heart-related anxiety and fear of movement, with kinesiophobia levels increasing in tandem with cardiac anxiety.

These results align with previous research. Keessen et al. noted that patients often avoid exercise when they perceive heart-related symptoms as dangerous (15). Similarly, Hüzmeli et al. observed that patients with high cardiac anxiety engage in less physical activity due to fear-avoidance beliefs (16). Our study confirms that CABG patients are susceptible to these psychological mechanisms.

While dyspnea is a common clinical finding, its management in cardiac patients is complicated by emotional factors. Leupoldt and Dahme argued that dyspnea perception is mediated by cognitive and emotional processes (17). The lack of a strong correlation between dyspnea and kinesiophobia in our results suggests that the fear of movement may be more closely tied to perceived cardiovascular risk than to immediate respiratory distress during the early postoperative phase.

Regression analysis confirmed that cardiac anxiety is a major determinant of exercise avoidance. Traditional demographic factors such as age and smoking status did not significantly influence kinesiophobia, suggesting that psychological interventions may be more effective than addressing physical factors alone in reducing fear of movement. Clinicians should evaluate patients for anxiety and avoidance behaviors, as exercise intolerance often stems from a combination of physiological and psychological barriers.

This study has several limitations. The sample size of 84 may limit the generalizability of the findings. The single-center design further restricts the external validity of the results. Future multi-center studies with larger cohorts are needed to validate these findings. Additionally, reliance on self-report measures for psychological status and symptoms may introduce subjective bias, and the absence of objective functional indicators could result in an underestimation of symptom severity.

CONCLUSION

A clear relationship exists between cardiac anxiety and kinesiophobia following CABG surgery. Interestingly, kinesiophobia was not directly correlated with dyspnea or postoperative pain in this cohort, suggesting that psychosocial factors play a dominant role in activity avoidance. Therefore, postoperative care should incorporate psychological screening alongside physical rehabilitation. A multidisciplinary approach involving cardiac, pulmonary, and psychological specialists is essential to break the cycle of inactivity and improve patient recovery after CABG.

Ethical approval

This study has been approved by the Clinical Research Ethics Committee of Bolu Abant İzzet Baysal University (approval date 05.12.2023, number 2023/416). Written informed consent was obtained from the participants.

Author contribution

Concept and Design: SK, AÖ, ERU, UAU, EAÖ, TK; Data Collection or Processing: AÖ, EAÖ, TK, UAU; Analysis or Interpretation: AÖ, UAU; Literature Search: SK, ERU, AÖ; Writing: SK, ERU, AÖ, UAU, EAÖ, TK. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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