EFFECTIVENESS OF PRE-OPERATIVE NURSING INTERVENTION PROGRAM ON ANXIETY AND PERCEIVED CONTROL PROGRAM IN PATIENT UNDERGOING CARDIAC SURGERY

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Abstract: *Patients undergoing cardiac surgery often experience significant preoperative anxiety, which can adversely affect surgical outcomes and recovery. Enhancing perceived control through structured nursing interventions has shown potential in alleviating anxiety and improving patient outcomes. However, evidence on the effectiveness of such interventions in resource-limited settings, such as Pakistan, is limited.* **Objective:** *To evaluate the effectiveness of a preoperative nursing intervention program in reducing anxiety and enhancing perceived control among patients undergoing cardiac surgery.* **Methods:** *This randomized controlled trial included 56 adult patients scheduled for cardiac surgery at Social Security Hospital, Lahore. Participants were randomly assigned to either an intervention group, receiving a structured nursing program, or a control group, receiving standard care. The intervention included educational sessions, relaxation techniques, and personalized consultations. Anxiety and perceived control were measured pre- and post-intervention using the State-Trait Anxiety Inventory (STAI) and a validated perceived control scale. Statistical analyses were conducted using paired and independent t-tests.* **Results:** *The intervention group demonstrated a significant reduction in mean anxiety scores (from 47.2 to 38.3, $p < 0.001$) and an improvement in mean perceived control scores (from 22.4 to 26.8, $p < 0.01$). Participant feedback indicated high satisfaction, with 78.6% expressing moderate to high approval of the program.* **Conclusion:** *The preoperative nursing intervention program effectively reduces anxiety and enhances perceived control in patients undergoing cardiac surgery. Integrating such interventions into standard care can improve psychological well-being and surgical outcomes, particularly in resource-limited healthcare settings. Further research is recommended to evaluate the long-term benefits and applicability of these interventions in diverse populations.*

Keywords: Preoperative nursing intervention, anxiety reduction, perceived control, cardiac surgery, patient-centered care, psychological outcomes.

Introduction

Cardiac surgery is a complex and high-stakes medical intervention often associated with significant psychological distress among patients. Anxiety levels are particularly high in the preoperative phase due to fear of the procedure, potential complications, and uncertainties regarding recovery. This anxiety can negatively impact physiological parameters, increase perioperative risks, and prolong postoperative recovery times. Preoperative nursing interventions, which focus on providing structured education and psychological support, have emerged as effective strategies to address this anxiety while enhancing patients' perceived control over their treatment and outcomes. However, the effectiveness of these interventions remains underexplored in the Pakistani context, where healthcare communication is often limited, and cultural factors may influence patient outcomes (1).

Preoperative anxiety has been shown to directly affect surgical outcomes, including increased postoperative pain, longer hospital stays, and delayed recovery (2). The State-Trait Anxiety Inventory (STAI) is commonly used to measure this anxiety, which is often prevalent in patients undergoing cardiac surgeries such as Coronary Artery Bypass Grafting (CABG) and valve repair or replacement procedures. Additionally, perceived control—defined as an individual's belief in their ability to influence outcomes—plays a crucial role in alleviating anxiety and promoting psychological well-being (3). Studies suggest that preoperative education and anxiety management programs, which focus on enhancing perceived control, can lead to better postoperative outcomes and increased patient satisfaction (4).

The implementation of nursing-led preoperative intervention programs is gaining traction globally. These programs include educational sessions, relaxation techniques, and personalized consultations, aiming to provide patients with the knowledge and skills needed to manage anxiety and feel more in control of their health. For instance, a meta-analysis demonstrated that structured preoperative education significantly reduced anxiety and improved patient satisfaction across various surgical disciplines (5). Despite these promising findings, limited data are available on the application and effectiveness of such programs in resource-constrained settings like Pakistan.

In Pakistan, cardiac surgery patients face unique challenges, including limited access to comprehensive preoperative education and minimal interaction with healthcare providers. Cultural norms, such as reliance on family for decision-making, further complicate the delivery of patient-centered care. Addressing these gaps, this study aims to evaluate the effectiveness of a preoperative nursing intervention program in reducing anxiety and enhancing perceived control among patients undergoing cardiac surgery in Pakistan. By providing evidence on the benefits of structured preoperative care, this research seeks to

contribute to the development of culturally tailored, resource-efficient strategies for improving patient outcomes in the region.

Methodology

This randomized controlled trial was conducted to evaluate the effectiveness of a preoperative nursing intervention program in reducing anxiety and enhancing perceived control among patients undergoing cardiac surgery at Social Security Hospital, Lahore. The study population consisted of 56 adult patients aged 18 to 75 years, scheduled for various cardiac surgeries, including Coronary Artery Bypass Grafting (CABG) and valve repair or replacement procedures. Patients able to understand and communicate in Urdu and who provided informed consent were included in the study. Exclusion criteria encompassed patients with a history of open-heart surgery, diagnosed psychiatric disorders, severe hearing impairments, or critical health conditions that could interfere with participation.

Participants were recruited using random sampling and were allocated into two groups through randomization. The intervention group received a comprehensive preoperative nursing intervention program, while the control group received standard preoperative care. The intervention program included structured educational sessions designed to provide detailed information about the surgical process, anesthesia, pain management, postoperative care, and techniques to manage anxiety, such as breathing exercises and guided imagery. Additionally, patients in the intervention group participated in activities aimed at enhancing perceived control, including detailed explanations of the surgical steps, recovery goals, and encouragement to actively engage in decision-making about their health. Individualized one-on-one consultations were provided to address specific concerns, and written materials such as leaflets and booklets were distributed to reinforce the information presented during the sessions.

Data were collected at two points: before the intervention (baseline) and two days prior to surgery (post-intervention).
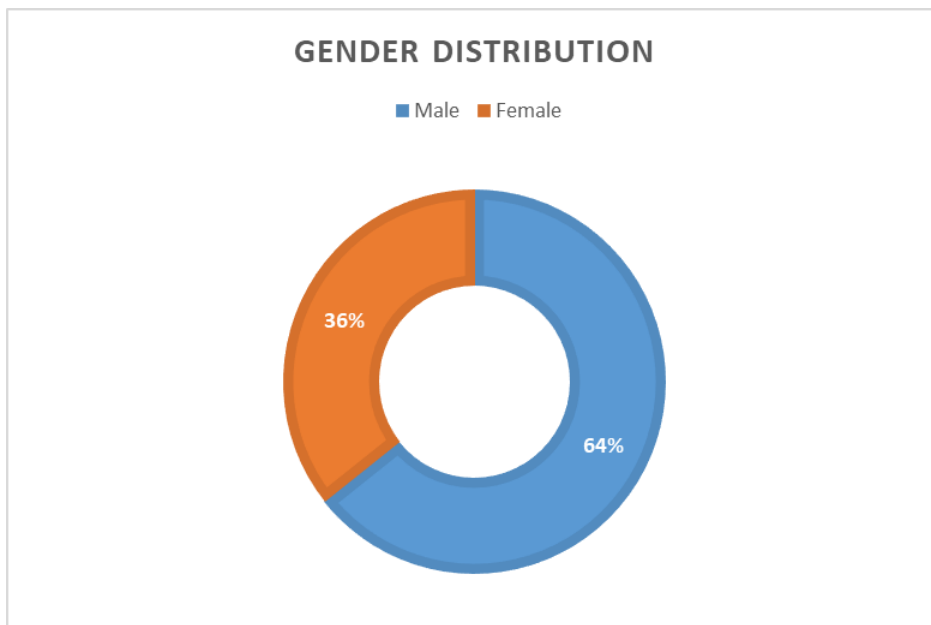
Anxiety levels were measured using the State-Trait Anxiety Inventory (STAI), with scores ranging from 20 to 80, where higher scores indicated greater anxiety. Perceived control was assessed using a validated scale, with scores ranging from 8 to 40, where higher scores reflected greater perceived control. Additionally, demographic and clinical data, including age, gender, educational level, occupation, and comorbidities, were collected using a structured questionnaire.

Ethical approval was obtained from the Institutional Review Board of the New Advance College of Nursing and Allied Health Sciences. Informed written consent was secured from all participants. The study adhered to ethical guidelines ensuring confidentiality and secure storage of data. Data analysis was performed using SPSS version 23. Descriptive statistics summarized demographic and clinical characteristics, while paired t-tests or Wilcoxon signed-rank tests were used for within-group comparisons of anxiety and perceived control scores. Independent t-tests or Mann-Whitney U tests were applied for between-group comparisons. Statistical significance was set at $p < 0.05$.

The intervention group showed significant reductions in anxiety and improvements in perceived control compared to the control group, demonstrating the efficacy of the structured nursing intervention program in preparing cardiac surgery patients psychologically. These results underscore the importance of integrating such interventions into standard care practices, especially in resource-limited settings.

Results

The demographic data of the participants (n = 56) is presented in Table 1. The majority of participants were males (64.3%) and aged between 46–60 years (35.7%). Regarding education, most had higher secondary education (35.7%), while a significant proportion was employed (60.7%). Monthly income levels varied, with 35.7% earning between PKR 40,000–60,000. (Table, figure 1)

Figure 1: Gender distribution of the study population

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Table 1: Demographic Characteristics of Participants

Variable	Categories	Frequency (n)	Percentage (%)
Age (years)	18–30	10	17.9
	31–45	18	32.1
	46–60	20	35.7
	>60	8	14.3
Gender	Male	36	64.3
	Female	20	35.7
Educational Level	Primary	8	14.3
	Secondary	15	26.8
	Higher Secondary	20	35.7
	Undergraduate/Postgraduate	13	23.2
Occupation	Employed	34	60.7
	Unemployed/Retired/Student	22	39.3

The most common planned surgery was Coronary Artery Bypass Grafting (CABG, 53.6%). The prevalence of hypertension (50.0%) and diabetes (39.3%) was notable among participants.(Table 2)

Table 2: Clinical History of Participants

Variable	Categories	Frequency (n)	Percentage (%)
Cardiac Surgery Type	CABG	30	53.6
	Valve Repair/Replacement	18	32.1
	Other	8	14.3
Comorbidities	Hypertension	28	50.0
	Diabetes	22	39.3
	COPD	8	14.3
	Previous Heart Attack	15	26.8

Participants' anxiety levels were assessed using the State-Trait Anxiety Inventory (STAI). Significant reductions in anxiety scores were observed after the intervention ($p < 0.001$). (Table 3)

Table 3: Comparison of Pre- and Post-Intervention Anxiety Scores

Time Point	Mean Anxiety Score	Standard Deviation	p-value
Pre-Intervention	47.2	10.4	< 0.001
Post-Intervention	38.3	9.5	

The intervention resulted in a statistically significant improvement in perceived control scores ($p < 0.01$). (Table 4)

Table 4: Perceived Control Scores Pre- and Post-Intervention

Time Point	Mean Control Score	Standard Deviation	p-value
Pre-Intervention	22.4	6.3	< 0.01
Post-Intervention	26.8	5.7	

Most participants found the intervention helpful in reducing anxiety and improving understanding of the surgical process. Overall, 78.6% expressed moderate to high satisfaction with the program. (Table 5)

Table 5: Feedback on Preoperative Nursing Intervention

Feedback Aspect	Very Helpful (%)	Moderately Helpful (%)	Somewhat Helpful (%)	Not Helpful (%)
Educational Sessions	50.0	28.6	14.3	7.1
Techniques to Manage Anxiety	50.0	26.8	17.9	5.3

Discussion

This study investigated the effectiveness of a preoperative nursing intervention program in reducing anxiety and enhancing perceived control among patients undergoing cardiac surgery. The findings reveal significant improvements in both psychological outcomes, supporting the efficacy of structured nursing interventions in this patient population.

The demographic characteristics indicated that most participants were male (64.3%) and aged between 46–60

years, reflecting the typical demographic for cardiac surgery patients due to the higher prevalence of cardiovascular disease in older adults (6). The educational background of participants showed a substantial portion had higher secondary education (35.7%), and the majority (60.7%) were employed, suggesting that the intervention was delivered to an educated and working-age population who are likely to benefit from structured preoperative education and anxiety management strategies.

The most common planned procedure was Coronary Artery Bypass Grafting (CABG), representing 53.6% of the surgeries. Hypertension (50.0%) and diabetes (39.3%) were the most prevalent comorbidities, consistent with global trends highlighting these conditions as major risk factors for cardiovascular disease (1). These findings underline the necessity of tailored preoperative care to address the unique psychological and clinical needs of cardiac patients with such comorbidities.

The results demonstrated a significant reduction in anxiety levels following the intervention. The mean pre-intervention anxiety score of 47.2 decreased to 38.3 post-intervention ($p < 0.001$). This reduction aligns with findings from other studies, which emphasize the role of preoperative education in reducing anxiety by providing patients with knowledge and coping strategies (4). Structured nursing interventions, such as relaxation techniques and guided imagery, likely contributed to this reduction by addressing the uncertainties and fears associated with surgery.

Similarly, the perceived control scores improved significantly, from a mean of 22.4 pre-intervention to 26.8 post-intervention ($p < 0.01$). Enhanced perceived control is associated with better psychological outcomes and faster recovery, as patients who feel more in control are better equipped to manage stress and adhere to postoperative care plans (2). This finding is consistent with previous research highlighting the importance of empowering patients through education and active participation in their care (7).

Participant feedback further supports the effectiveness of the intervention. Most participants (78.6%) expressed moderate to high satisfaction with the program, highlighting the value of educational sessions and anxiety management techniques. These findings emphasize the importance of incorporating patient-centered approaches in preoperative care to improve satisfaction and psychological well-being (8).

The study's results are particularly relevant in the context of Pakistan, where healthcare systems often lack structured patient education programs. By addressing gaps in communication and providing culturally tailored interventions, this study demonstrates the potential to enhance preoperative care in resource-limited settings. Future research should explore the long-term impact of such interventions on recovery outcomes and quality of life.

Conclusion

This study demonstrates that a structured preoperative nursing intervention program significantly reduces anxiety and enhances perceived control in patients undergoing cardiac surgery. The intervention, which included educational sessions, relaxation techniques, and personalized consultations, proved effective in addressing preoperative psychological distress and empowering

patients. These findings are particularly relevant in resource-limited settings like Pakistan, where patient-centered care is often underemphasized. By integrating structured interventions into routine care, healthcare providers can improve both psychological well-being and clinical outcomes for cardiac surgery patients.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval
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