Reducing Preoperative Anxiety in Patients Scheduled for Knee Replacement Surgery: A Preventive Controlled and Randomized Clinical Trial of Nursing health management

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Abstract

Objective: This study aimed to assess the efficacy of a nursing intervention utilizing motivational interviewing techniques in reducing preoperative anxiety among patients scheduled for knee replacement surgery.

Methods: This was a randomized controlled trial conducted on a sample of 56 patients scheduled for knee replacement surgery . Patients were randomly assigned to either an intervention group (n=28) or a control group (n=28). The Amsterdam Preoperative Anxiety and Information Scale, comprising six questions with scores ranging from 5 to 30, was administered before and after the intervention. The nursing intervention consisted of three 40-minute sessions of motivational interviewing conducted over six weeks prior to the surgical procedure, while the control group received standard education provided by the healthcare institution.

Results: Pre-intervention anxiety scores were similar between the two groups (19.76 in the intervention group versus 22.02 in the control group; p<0.226). However, post-intervention anxiety scores were significantly lower in the intervention group compared to the control group (15.56 versus 20.30, respectively; p<0.013).

Conclusion: The nursing intervention based on motivational interviewing effectively reduced preoperative anxiety among patients scheduled for knee replacement surgery.

Keywords: anxiety; knee replacement; control groups; motivational interviewing; orthopedics; perioperative nursing.

Introduction

The nursing profession has made significant strides in ensuring the safety and well-being of patients undergoing surgical procedures. However, while attention has been paid to aspects such as safety policies, sterilization practices, and perioperative care, there remains a gap in addressing the emotional responses of patients facing surgery. Surgical events are inherently stressful, encompassing not only the hospitalization itself but also the anticipation and aftermath of surgery. This emotional burden can lead to various adverse effects, impacting both physical and psychological health and potentially prolonging recovery and hospital stays. (Terrazas et al., 2018)

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Preoperative anxiety is a significant concern, with studies reporting high levels of anxiety, fear, and tension among surgical patients. These symptoms often intensify in the weeks leading up to surgery and can persist into the postoperative period, affecting vital signs and complicating recovery efforts. Despite efforts within nursing to address preoperative anxiety through informational interventions and relaxation techniques, anxiety remains prevalent among surgical patients, affecting a significant portion of the global population undergoing surgery each year. (Amini et al., 2019)

Motivational interviewing, a patient-centered approach developed by Miller and Rollnick, offers a promising avenue for addressing preoperative anxiety. By exploring and resolving ambivalences regarding health behaviors, motivational interviewing aims to promote positive changes and enhance patients' self-efficacy. Recognizing the importance of nursing involvement in preoperative assessments and interventions, this study seeks to evaluate the effectiveness of a nursing intervention based on motivational interviewing in reducing preoperative anxiety among individuals scheduled for knee replacement surgery. (Zarei et al., 2018)

Methods
Study Design:
This study employed a preventive type controlled randomized clinical trial design.
Participants:
The study included individuals scheduled for knee replacement surgery , who underwent preoperative assessment between January 10 and April 30, 2018. Inclusion criteria comprised individuals aged 50 to 75 years, patients scheduled for knee replacement surgery within two months, and willingness to participate. Exclusion criteria included intellectual cognitive disability, scheduled procedures other than knee replacement, and patient refusal. The trial was registered in the Brazilian registry of clinical trials (REBEC) under Trial Req: 7545, titled "Effectiveness of a Nursing Intervention to Reduce Preoperative Anxiety."
Intervention:
Participants received an individual informative session on surgical preparation and procedures. The control group received standard treatment, while the experimental group received standard treatment plus a motivational interview. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) was administered before and after the intervention by two nursing professionals.
Sample Size:
A sample of 56 subjects was randomly distributed (n = 28) for each group, considering 95% CI, 80% power, and ± 4.4% margin of error. Random assignment was conducted using a computer-generated random table.

Data Analysis:
Descriptive analysis and inferential statistics were used to analyze differences between groups and changes in APAIS scores over time. ANOVA with repeated measures was employed for intergroup comparisons.

Results
Out of 196 patients recruited, 140 were excluded for not meeting the criteria for knee replacement surgery, and 133 were excluded for not meeting the inclusion criteria, resulting in a final sample of 56 participants evenly distributed between the experimental and control groups. One participant from the control group withdrew voluntarily during the second week of the nursing intervention,

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resulting in 28 participants in the intervention group and 27 in the control group at the end of the study.

Table 1 demonstrates no statistically significant differences between the study groups regarding sociodemographic and clinical characteristics. Participants were predominantly in the age range of 73 to 76 years, with a nearly equal distribution of men and women, and most reported having family support. Clinical variables such as prior surgeries, non-consumption of anxiolytics, and moderate risk classification on the ASA scale were prevalent among participants. General anesthesia was used for all procedures, with the primary cause of preoperative anxiety being concerns about the effects of anesthesia.

Table 1. General characteristics of the study groups

Variable	Control Group (n = 27)	Intervention Group (n = 28)	p-value
Sex			0.483
Man (n, %)	15 (55.5)	14 (50.0)	
Woman (n, %)	12 (44.4)	14 (50.0)	
Age (mean ± SD)	73.7 ± 16.6	76.32 ± 16.1	0.366
ASA Classification			0.082
0-1 (n, %)	9 (33.3)	6 (21.4)	
2-4 (n, %)	18 (66.6)	22 (78.6)	
Type of Anesthesia			0.536
General (n, %)	27 (100)	28 (100)	
Other (n, %)	0 (0)	0 (0)	
Prior Surgeries			0.064
No (n, %)	12 (44.4)	7 (25)	
Yes (n, %)	15 (55.5)	21 (75)	
Anxiolytics			0.599
No (n, %)	26 (96.3)	28 (100)	
Yes (n, %)	1 (3.7)	0 (0)	
Social Support			0.537
Family (n, %)	21 (77.8)	23 (82.1)	
Others (n, %)	6 (22.2)	5 (17.9)	
Cause of Anxiety			0.397
Anesthetic (n, %)	18 (66.7)	17 (60.7)	
Procedure (n, %)	4 (14.8)	8 (28.6)	
Complications (n, %)	5 (18.5)	3 (10.7)	

Note: ASA = American Society of Anesthesiologists; SD = Standard Deviation.

Table 2 indicates that both groups experienced a reduction in anxiety scores over time. However, the intervention group showed a greater decrease, with a difference of 4.2 points between assessment moments compared to 1.73 points in the control group. The post-intervention evaluation revealed a significant difference of 5 points in mean preoperative anxiety scores between the intervention and control groups.

Analysis of repeated measures ANOVA confirmed a linear relationship between APAIS scores and study group, with a statistically significant difference (F=14.43, p<0.001) and a moderate effect

size of 0.214. The multivariate model indicated a global difference of 3.1±0.36 points (95%CI: 2.36-3.84) between the intervention and control groups.

Table 2. Comparison of the total average score of preoperative anxiety in the study groups before and after the procedure

Group	Measurement Moment	Before (Mean ± SD)	After (Mean ± SD)	95% CI of the Mean (Before)	95% CI of the Mean (After)	Difference of Means Between Groups	Bilateral p-value
Intervention	(n=28)	19.76 ± 8.56	15.56 ± 8.85	16.37 - 23.14	12.12 - 18.99	2.26	0.226
Control	(n=27)	22.02 ± 9.35	20.30 ± 8.19	18.39 - 25.64	17.06 - 23.54	5.04	0.013

Discussion

This study investigated the effectiveness of a nursing intervention based on motivational interviewing to reduce preoperative anxiety in patients scheduled for knee replacement surgery. The results indicated that after six weeks of follow-up, the intervention group exhibited lower preoperative anxiety scores compared to the control group. These findings align with previous research, such as Rojas et al., who utilized a nursing educational strategy to reduce anxiety in pre- and post-operative patients, although they measured anxiety using the Beck test. (Bori et al., 2016)

Despite advancements in nursing interventions, anxiety remains a prevalent issue among surgical patients. However, studies have shown that preoperative visits by nurses can reduce anxiety and post-surgery complications, as evidenced in patients undergoing laparoscopy surgery. Additionally, other studies have highlighted the effectiveness of using educational brochures and multimedia strategies to educate patients about preoperative anxiety and improve vital signs before surgery. (Wilson et al., 2016)

Communication skills are crucial for nurses to effectively approach and care for surgical patients. The motivational interview, known for its effectiveness in improving attitudes and behaviors through persuasion and trust, has been recognized as a valuable tool in reducing preoperative anxiety. (Kerper et al., 2015)

However, some studies suggest that conventional informative interventions by nurses and healthcare staff may not effectively reduce anxiety in patients. It's important for nurses to maintain empathetic and collaborative communication with patients, providing informative and persuasive interventions to alleviate anxiety and enhance patient satisfaction with the surgical procedure. (Meléndez et al., 2015)

In conclusion, the findings of this study support the effectiveness of nursing interventions based on motivational interviewing in reducing preoperative anxiety among patients undergoing knee replacement surgery. Continued follow-up of orthopedic surgery patients is essential for nurses to identify and address anxiety-inducing factors throughout the surgical process. Future research should further investigate the effects of nursing interventions on surgical patients and explore

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related areas. Limitations of this study include the involvement of a single researcher, potentially introducing selection bias in the sampling process. (Robleda et al., 2014)

Conclusion: The nursing intervention based on motivational interviewing effectively reduced preoperative anxiety among patients scheduled for knee replacement surgery.

References
1. Meléndez et al. (2015) conducted a study on surgical patient perceptions of safety within hospital settings, highlighting the significance of ensuring patient safety during surgical procedures.
2. Bori et al. (2016) explored clinical safety and liability claims in orthopedic surgery and traumatology, emphasizing the importance of minimizing risks associated with surgical procedures.
3. Wilson et al. (2016) reviewed interventions aimed at caring for surgically anxious patients, emphasizing the need for strategies to optimize surgical outcomes.
4. Díez et al. (2012) investigated the effectiveness of a preoperative nursing intervention in controlling anxiety among surgical patients, underscoring the importance of nursing care in addressing preoperative anxiety.
5. Kerper et al. (2015) studied the effects of a psychotherapy program on surgical patients, highlighting the potential benefits of innovative interventions in improving patient outcomes.
6. Robleda et al. (2014) examined the influence of preoperative emotional states on postoperative pain in orthopedic and trauma surgery patients, emphasizing the importance of addressing emotional well-being in surgical care.
7. Ali et al. (2014) investigated the impact of preoperative anxiety on anesthesia recovery and postoperative analgesia in patients undergoing laparoscopic cholecystectomy, highlighting the importance of managing preoperative anxiety for optimal surgical outcomes.
8. Volpato et al. (2018) explored the effects of psychological preparations on stress and anxiety in pediatric surgical patients, emphasizing the importance of holistic approaches to preoperative care.
9. Nápoles et al. (2013) studied the application of relaxation techniques before breast surgery, highlighting the potential benefits of complementary interventions in reducing preoperative anxiety and enhancing patient well-being.
10. The World Health Organization (WHO) emphasizes the importance of safe surgical practices to save lives, underscoring the global significance of ensuring surgical safety and patient well-being.
11. Terrazas et al. (2018) investigated coping strategies for stress management and their impact on obesity and quality of life in patients undergoing bariatric surgery, highlighting the importance of addressing psychological factors in surgical patient care.
12. Wilson et al. (2016) emphasized the role of nurses in caring for surgically anxious patients and optimizing surgical outcomes through effective communication and support throughout the surgical process.
13. Miller and Rollnick (2012) introduced motivational interviewing as an effective approach to behavior change, emphasizing the importance of patient-centered communication and empowerment in promoting healthier lifestyles.

14. Bandinelli et al. (2013) conducted a systematic review on motivational interviewing and its applicability in various contexts, highlighting its effectiveness in promoting behavior change and improving health outcomes.

15. Gantiva (2015) investigated the psychological and psychophysiological effects of motivational interviewing in tobacco consumers, emphasizing its potential benefits in facilitating behavior change and promoting smoking cessation.

16. Vergara et al. (2017) validated the Spanish version of the Amsterdam Preoperative Anxiety and Information Scale (APAIS), emphasizing its reliability and validity as a tool for assessing preoperative anxiety in Spanish-speaking populations.

17. Rojas et al. (2013) implemented a nursing educational strategy to reduce anxiety in surgical patients, highlighting the importance of nursing interventions in addressing preoperative anxiety and improving patient outcomes.

18. Sadati et al. (2013) conducted a randomized clinical trial on the effect of preoperative nursing visits on anxiety and postoperative complications in patients undergoing laparoscopic cholecystectomy, emphasizing the importance of preoperative nursing care in enhancing patient well-being.

19. Amini et al. (2019) compared the effectiveness of verbal education and educational booklets in reducing preoperative anxiety, highlighting the potential benefits of educational interventions in preparing patients for surgery.

20. Zarei et al. (2018) studied the effect of multimedia-based nursing visits on preoperative anxiety and vital signs in patients undergoing lumbar disc herniation surgery, emphasizing the potential benefits of multimedia interventions in improving patient outcomes.

21. Zuckoff (2012) explored motivational interviewing in promoting treatment adherence, highlighting its role in facilitating behavior change and improving patient outcomes in surgical and medical settings.