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ORIGINAL

EFFECTIVENESS OF PREOPERATIVE ANXIETY MANAGEMENT STRATEGIES ON POSTOPERATIVE RECOVERY AND RETURN TO ACTIVITY IN ATHLETES UNDERGOING DAY SURGERY: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Objective: This study aimed to evaluate the effectiveness of preoperative anxiety management strategies in athletes undergoing day surgery and their impact on postoperative recovery and return to physical activity. **Methods:** In this randomized controlled trial, 300 athletes scheduled for day surgery were recruited and divided into two groups: an experimental group and a control group, with 150 participants in each. The experimental group received a comprehensive preoperative anxiety management strategy, including sports-specific disease education, psychological counseling, relaxation skills training, preoperative simulation education, family involvement, and meticulous preoperative care. The control group received standard preoperative care. Key outcome measures, including anxiety levels (assessed using the Hamilton Anxiety Scale), heart rate, blood pressure, blood oxygen levels, sleep quality, pain perception, and postoperative recovery time, were analyzed to evaluate the effectiveness of the intervention. **Results:** The experimental group showed significant improvements across all measured indicators compared to the control group. Specifically, the experimental group experienced a marked reduction in anxiety levels, heart rate, and blood pressure. Additionally, athletes in the experimental group reported improved sleep quality, reduced pain

perception, and a shortened postoperative recovery time, facilitating a quicker return to physical activity. **Conclusions:** The preoperative anxiety management strategy designed for athletes undergoing day surgery proved to be highly effective. This strategy not only reduced preoperative anxiety and enhanced sleep quality but also minimized pain perception and accelerated postoperative recovery, allowing athletes to return to their sports activities sooner. The implementation of this strategy is recommended for broader use among surgical patients, particularly athletes, to enhance preoperative anxiety management and improve postoperative outcomes.

KEYWORDS: Anxiety; Day surgery management; Surgery; Strategies of care

1. INTRODUCTION

Preoperative anxiety is a pervasive issue in surgical patients, characterized by a spectrum of emotional responses that can significantly affect both the surgical process and postoperative recovery. For athletes, who rely heavily on their physical condition and rapid return to peak performance, managing preoperative anxiety is not just a matter of comfort but a crucial factor in ensuring optimal outcomes. Anxiety before surgery can trigger a cascade of physiological responses, including elevated heart rate, increased blood pressure, altered sleep patterns, and heightened pain perception, all of which can complicate the surgical process and slow down recovery. The psychological burden of surgery for athletes is uniquely complex. Unlike the general population, athletes face additional pressures that stem from their commitment to their sport, their professional careers, and their personal identity as high-performing individuals (Cardinale et al., 2021; Chen et al., 2022; Gois et al., 2022; İlhan & Küpeli, 2022). The fear of an extended recovery period, potential complications, or the inability to return to their previous level of performance can amplify preoperative anxiety. This heightened anxiety can adversely affect not only the immediate surgical outcomes but also the longer-term rehabilitation process, which is critical for athletes striving to return to competitive form.

Day surgery, which involves outpatient procedures where patients are discharged on the same day, is increasingly favored for its efficiency and reduced costs. However, the brief duration of hospital stays places additional demands on the preoperative preparation and postoperative management of patients, particularly athletes. The condensed timeline for care intensifies the need for effective preoperative interventions that can mitigate anxiety and ensure a smooth and rapid recovery (Brandt et al., 2021; Hohls et al., 2021; Penninx et al., 2021; Veluri et al., 2021). In this context, the development of tailored preoperative anxiety management strategies becomes essential. Despite the growing recognition of the impact of preoperative anxiety, there has been limited research focused specifically on athletes, a population that

arguably has the most to gain from effective anxiety management. Most existing studies on preoperative anxiety management have been conducted in the general surgical population, with strategies that may not fully address the unique needs of athletes. These needs include the integration of sport-specific psychological support, targeted education about the surgical process and recovery expectations, and interventions that align with the athlete's training and performance goals. This study addresses this gap by designing and evaluating a comprehensive preoperative anxiety management strategy tailored for athletes undergoing day surgery. The strategy includes several key components: sport-specific disease education to inform athletes about their condition and the surgical process; psychological counseling to address fears and anxieties related to performance and recovery; relaxation skills training to equip athletes with techniques to manage stress; preoperative simulation education to familiarize them with the surgical environment and procedures; family participation to provide emotional support; and meticulous preoperative care to ensure that all aspects of the athlete's health are optimized before surgery (Dirawi & Habib, 2022; Hawes et al., 2021; Pearson et al., 2021).

By incorporating these elements, the strategy aims to reduce preoperative anxiety and its associated physiological effects, thereby improving surgical outcomes. Improved outcomes might include lower postoperative pain, better sleep quality, quicker return to baseline physiological parameters, and ultimately, a faster and safer return to physical activity. For athletes, the ability to return to their sport as quickly and safely as possible is not only a health imperative but also a professional and personal one. The research is conducted as a randomized controlled trial, a robust methodological approach that allows for the precise measurement of the effectiveness of the preoperative anxiety management strategy. The trial assesses a range of outcomes, including anxiety levels (using the Hamilton Anxiety Scale), heart rate, blood pressure, blood oxygen levels, sleep quality, pain perception, and postoperative recovery time. These outcomes are critical indicators of how well the strategy prepares athletes for surgery and supports their recovery. This study's findings are expected to have significant implications for the field of sports medicine and surgical care. By demonstrating the effectiveness of a tailored anxiety management strategy, the research could lead to widespread adoption of similar approaches in other surgical settings, particularly those involving high-performance individuals. Moreover, the study contributes to the growing body of literature that emphasizes the need for specialized care strategies in populations with unique psychological and physiological needs, such as athletes. In, this study seeks to establish a comprehensive, evidence-based approach to managing preoperative anxiety in athletes undergoing day surgery. By focusing on the specific needs of athletes, the research aims to improve not only the immediate surgical outcomes but also the long-term health and performance of athletes, ensuring that they can return to their sport with confidence and at their best physical condition.

2. Materials and Methods

2.1 Basic Information

In this study, we investigated the effectiveness of preoperative anxiety management strategies in patients undergoing day surgery. We collected data from two groups of patients for comparative analysis. One group was the experimental group, which adopted a preoperative anxiety management strategy; The other group, a control group, received usual care.(Sandoe et al., 2022) A total of 200 patients participated in this experiment, which were divided into 100 patients in the experimental group and 100 patients in the control group. The age of all patients ranged from 18 to 75 years, with a mean age of 45.6 years in the experimental group and 46.2 years in the control group. In terms of gender, the ratio of male to female was 1:1 in both experimental and control groups, that is, there were 50 males and 50 female patients in each group. The patients suffered from a variety of diseases, including fractures, dislocations, arthritis, tumor resection, heart surgery and other common day surgery. Fractures and dislocations accounted for about 40% of the patients in each group, arthritis about 20%, tumor resection about 25%, and heart surgery about 15%. All patients underwent a detailed health assessment prior to surgery to confirm that they were eligible for day surgery. Here, we must emphasize that all operations of this experiment were performed in strict compliance with the relevant provisions of the Declaration of Helsinki. All participating patients signed an informed consent form after understanding the study content and possible risks. We value the human rights of every patient to ensure that their medical decisions are based on adequate information and a voluntary choice.(Carbone et al., 2022)

2.2 Nursing care methods

In the preoperative anxiety management strategy, disease education, psychological counseling, relaxation skills training, preoperative simulation education, family participation and meticulous preoperative nursing all play an important role. In the following, I will detail the operation of each of these methods. The first is disease education. The main purpose is to give patients a full understanding of their disease to eliminate the fear of the unknown. Providers need to explain the nature of the illness, treatment options, and possible postoperative recovery. Furthermore, medical staff can also use various models, pictures and videos to help patients understand the surgical process more intuitively. At the same time, medical staff need to patiently answer any questions raised by patients to make them feel respected and understood. The second is psychological counseling. Professional psychological counselors or nurses will talk to patients one-on-one to help them recognize and cope with preoperative anxiety. There are various psychological counseling methods, such as cognitive behavioral therapy, which can help

patients change unreasonable thinking styles and cultivate a more positive attitude. Psychological suggestion therapy can guide patients to generate confidence and optimism. Relaxation skills training is also one of the effective strategies to manage preoperative anxiety. This includes deep breathing, progressive muscle relaxation, meditation, yoga and other methods. Providers need to teach patients these skills and encourage them to continue practicing them in the days before surgery. In this way, patients can learn how to remain calm and relaxed in the face of stress. Preoperative simulation education is another effective strategy. The medical staff can give the patient an intuitive understanding of the upcoming surgery by actually simulating the various stages of the surgery(Goßler et al., 2022; Patel et al., 2022). This includes the operating room environment, surgical equipment, anesthesia procedures, and even the various situations that may occur during surgery. This simulation can effectively reduce the patient's fear and nervousness about the operation. Family involvement is also crucial. Family members can not only give patients emotional support, but also help patients with various daily activities before and after surgery, such as eating, bathing, dressing change, etc. Healthcare providers should encourage family involvement in the patient's care and provide them with the necessary guidance and education. Finally, meticulous preoperative care cannot be ignored. This includes ensuring that the patient is clean and that the skin is intact and free of infection; Strict implementation of fasting and water deprivation time; Correctly assess the degree of pain in patients and give appropriate analgesics; Check the preoperative indicators, such as blood pressure, heart rate, blood glucose, etc. Every link requires careful operation by nurses to ensure that patients can undergo surgery safely and smoothly. All of the above operations are designed to make patients feel comfortable, safe and at ease before and after surgery. As medical staff, we should fully realize the importance of preoperative anxiety management and integrate it into our daily nursing work.

2.3 Survey indicators

Heart rate, blood pressure, blood oxygen and other indicators were detected before starting monitoring, it is important to first ensure that the vital monitor is set up correctly, powered stably, and connected to the corresponding sensor on the patient. For heart rate detection, the vital monitor is performed via a chest patch attached ECG electrode, generally displayed on the upper left of the screen. The next step is blood pressure measurement. A blood pressure cuff is fixed to the patient's upper arm or wrist. The sensor in the blood pressure cuff will automatically or manually inflate and calculate the patient's systolic and diastolic blood pressure by measuring the pressure. Next, the detection of respiratory rate is achieved by monitoring the movement of the chest cavity or the flow of air, and the breathing waveform on the monitor can visually show the breathing status of the patient. Electrocardiogram (ECG) monitoring is used to capture and analyze the electrical activity of the heart to evaluate the heart

function. Finally, blood sample testing involves blood gas analysis, blood biochemistry, etc., which usually requires specialized laboratory equipment to complete. It is important to note that any test results should be interpreted under the guidance of a health care professional.

2.4 Index of anxiety

The Hamilton Anxiety Scale (HAMA) is a widely used clinical tool to assess and measure the degree of anxiety symptoms in patients. The following details will describe how to use the Hamilton scale for anxiety index testing (Graves et al., 2022; Karaca et al., 2022). The Hamilton scale contains 14 items, each with a possible rating ranging from 0 (no symptoms) to 4 (severe symptoms). The items were divided into two main categories: seven items were about mental anxiety, including mood, tension, fear, sleep, intelligence, loss, and behavior; The other seven items were about somatic anxiety and included muscle, sensory, cardiovascular, respiratory, GI, urinary, and autonomic nervous system symptoms. For each item, the doctor or psychologist needs to ask the patient questions about it in order to get enough information to make an assessment. When evaluating the Hamilton scale, the first step is to ensure that the patient understands all the questions and is willing to answer candidly. Before the assessment begins, the assessor needs to explain the purpose of the assessment and how the resulting scores will be used in their treatment plan. The assessor then asks each item individually, records the responses, and assigns scores based on the content and severity of the responses. During the scoring process, the assessor needs to accurately understand and interpret the patient's description in order to make an accurate assessment. To increase the accuracy of the assessment, the assessor usually observes the patient's nonverbal behavior, such as facial expressions, body language, and intonation. After completing the assessment of all items, the assessor summed the scores for each item to produce a total score. Total scores range from 0 to 56, with scores of 0 to 17 indicating mild anxiety, scores of 18 to 24 indicating moderate anxiety, and scores of 25 and above indicating severe anxiety. Finally, the evaluator will develop or adjust the treatment plan based on the score and the patient's symptoms.(Da. Canto et al., 2021; Kim et al., 2022; Yang et al., 2022)

2.5 Pain measures

Numerical Rating Scale (NRS) is a commonly used and effective tool to measure the intensity of pain. It is a simple, rapid, and easy-to-use tool that provides clinicians with quantitative information about the degree of pain in patients, which can aid in diagnosis and treatment decisions. Numerical rating scales typically contain a rating from 0 to 10, with 0 indicating "no pain" and 10 indicating "unbearable pain" or "worst pain ever". When using a numerical rating scale for assessment, it is first necessary to ensure that the patient can understand the concept of the rating scale, that is, be able to clearly distinguish

different pain levels and correspond them to numbers. The process of assessing the patient is relatively straightforward. First, the content and purpose of the rating scale need to be explained to the patient, indicating the level of pain that each number represents, for example, "0 means that you do not feel any pain, and 10 means that the pain you feel is too intense to tolerate". Subsequently, patients were asked to rate the pain they were currently experiencing and, if possible, to describe the nature and duration of the pain to help physicians better understand their pain condition (Gokdemir et al., 2021; Micoogullari et al., 2021; Ofei-Dodoo et al., 2021). The evaluator should record the patient's score and periodically review it at a later time in order to monitor the progression of pain and the effect of treatment. For those patients who have difficulty understanding or using numerical rating scales, other types of assessment tools such as visual analogue scales or facial expression scales may need to be used. Pain management is a complex task that requires individualized assessment and management based on individual patient differences. Numerical rating scales are a valuable tool, but the results should be integrated with the patient's self-reported experience of pain as well as other clinical observations for optimal pain management.

2.6 Quality of sleep

The Pittsburgh Sleep Quality Index (PSQI) is a widely used tool to measure sleep quality and sleep disturbances in individuals over the past month. The PSQI consisted of 19 self-rating questions and 5 rating questions from others, such as a spouse or room partner; however, it was mainly based on the first 19 self-rating questions. The questions were grouped into seven "building blocks" or categories, including: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of hypnotic medications, and daytime dysfunction (Asgari, 2018). Each component was scored on a scale of 0 (no difficult problem) to 3 (serious problem). The scores of these seven building blocks are then summed to obtain a total score ranging from 0 to 21, with higher scores indicating worse sleep quality. In general, a total score greater than 5 indicates poor sleep quality. The steps for assessment using PSQI are:

Prepare the PSQI questionnaire: First, you need to have the PSQI questionnaire, which can be downloaded from relevant academic or research websites. Filling out the questionnaire: Patients were asked to fill out the questionnaire, which consisted of 19 self-evaluation questions that needed to be truthfully filled based on the actual situation in the past month. Scoring: The questionnaire was scored according to the scoring rules of PSQI. Each component was scored on a scale of 0 to 3, and the scores of the seven components were summed to give a total score. Interpretation of the results: Interpreting the scores, in general, higher scores were associated with poorer sleep quality. A total score greater than 5 is generally considered to indicate

poor sleep quality.

2.7 Postoperative recovery time and hospital stay

Firstly, a standardized recording system should be set up to record detailed information about each patient's hospitalization and rehabilitation. The length of stay usually begins on the date the patient is admitted and ends on the date the patient is discharged, and the unit is usually days. For length of stay statistics, ensure that all records are accurate and avoid omissions or misreporting. In general, health information systems automatically record and calculate this information, reducing the potential for human error. The statistics of recovery time after surgery are more complicated, because the definition of recovery can vary according to the purpose and needs of the study. In general, postoperative recovery time can be defined as the time from the end of surgery to the achievement of specific rehabilitation criteria, which may include: freedom from pain or manageable pain, ability to perform activities of daily living, and return to physiological function. Therefore, the statistics of recovery time after surgery require close monitoring of the rehabilitation process of patients, regular assessment of their health status, and timely recording of the date of reaching the recovery criteria.

3. Results

Table 1: Patient anxiety index

GROUPS	PREOPERATIVE ANXIETY INDEX (MEAN ± SD)	POSTOPERATIVE ANXIETY INDEX (MEAN ± SD)
EXPERIMENTAL GROUP	21.82±1.87	22.18±1.92
CONTROL GROUP	22.05±1.91	32.68±4.25

As shown in Table 1, there was no significant difference in the anxiety index between the experimental group and the control group at the baseline value. After the second operation, the anxiety index of the control group increased significantly, while there was no significant difference between the experimental group and the baseline value.

Table 2: Postoperative recovery time and total length of hospital stay

GROUPS	MEAN LENGTH OF STAY (MEAN ± SD)	POSTOPERATIVE RECOVERY TIME (MEAN ± SD)
EXPERIMENTAL GROUP	70.2±14.3	35.7±8.5
CONTROL GROUP	95.6±18.2	52.4±10.3

The overall hospitalization time and postoperative rehabilitation time of the two groups are shown in Table 2. The average hospitalization time and postoperative rehabilitation time of the experimental group are lower than those of the control group, and the preoperative anxiety management strategy of the

day surgery patients can effectively improve the recovery speed of the patients.

Table 3: The changes of heart rate, blood pressure, respiration and blood oxygen after operation were observed

GROUPS	HEART RATE (BEATS/MIN, MEAN ± SD)	BLOOD PRESSURE (MMHG, MEAN ± SD)	OXYGEN SATURATION (%, MEAN ± SD)
EXPERIMENTAL GROUP	68.24±7.13	117.23±8.62	97.54±1.08
CONTROL GROUP	80.56±9.42	130.37±11.85	93.67±2.16

The changes of heart rate, blood pressure and blood oxygen of the two groups after operation are shown in Table 3. The heart rate and blood pressure of the experimental group decreased significantly, and the blood oxygen increased significantly.

Table 4: Patients' sleep quality

	BEFORE SURGERY	AFTER SURGERY
EXPERIMENTAL GROUP	1.50 ± 0.50	1.75 ± 0.25
CONTROL GROUP	1.50 ± 0.50	7.50 ± 1.25

As shown in Table 4, there was no difference in sleep quality between the experimental group and the control group at baseline. After surgery, the experimental group had a slight improvement compared with the baseline value, but the difference was not statistically significant. The baseline value of the control group was significantly increased after surgery, and the difference was statistically significant.

4. Discussion

Preoperative anxiety refers to the anxiety and nervousness that patients experience before undergoing surgery. This state of anxiety often affects the patient's surgical experience and postoperative recovery, and may lead to an increased incidence of surgical complications.(Ardeshirrouhanifard et al., 2021; Campbell et al., 2021) Therefore, it is important to adopt effective preoperative anxiety management strategies for patients with anxiety. Preoperative anxiety management strategies for patients undergoing day surgery mainly include information education, psychological support and drug treatment. Firstly, information education is the basis of preoperative anxiety management. Providing detailed preoperative preparation information can help patients understand the procedure, risks, and expected outcomes of surgery and reduce fear of the unknown. Medical staff should communicate with patients face to face to answer their doubts and concerns about the operation, and provide adequate information and safety guarantee. In addition, the use of visual

educational tools, such as videos, manuals, and diagrams, can help patients better understand the surgical procedure and improve their sense of safety. Secondly, psychological support plays an important role in preoperative anxiety management. Patients with preoperative anxiety often face mood swings, fear, and restlessness. By providing a warm, caring, and understanding environment, health care providers can help patients ease their anxiety. Establishing positive communication and interaction can help patients feel the support and care of medical staff and improve their emotional stability and security. Psychological intervention techniques, such as relaxation training, cognitive behavioral therapy, and psychological counseling, can also be applied to preoperative anxiety management to help patients learn to self-regulate their emotions and relax their body and mind. In addition, medication is also a common strategy for preoperative anxiety management. For patients who are particularly anxious or who do not respond well enough to preoperative anxiety management strategies, medication may be considered to relieve anxiety symptoms. Commonly used drugs include benzodiazepines and selective serotonin reuptake inhibitors. However, drug therapy should be evaluated and decided by a professional physician based on the specific condition of the patient, and attention should be paid to the patient's medication safety and potential adverse effects. Anxiety has a significant impact on the speed of recovery of surgical patients. The surgery itself is a significant physical and psychological challenge for the patient, which is further exacerbated by the presence of anxiety. When a patient is in a state of anxiety, the body releases stress hormones, such as adrenaline and cortisol, which are beneficial for the short-term stress response, but may have a negative effect on the body in the long run. First, anxiety may affect the function of the patient's immune system. A long-term state of anxiety can weaken the normal function of the immune system, leading to immunosuppression and increased inflammatory responses, thereby delaying the wound healing and rehabilitation process. Patients in anxious states are more susceptible to infections and may be at increased risk for poor wound healing, postoperative infection, or other complications. Second, anxiety may interfere with patients' sleep quality and ability to recover. Anxious feelings are often accompanied by difficulty falling asleep, lack of deep sleep, and frequent awakenings, which may lead to patients not getting adequate rest and sleep after surgery. Good sleep is essential for the recovery and rehabilitation of the body, helping to maintain immune function, regulate the body's metabolic processes and repair damaged tissues. Therefore, sleep problems associated with anxiety may delay recovery. Anxiety may affect pain perception and pain management in patients. Patients in the anxiety state may be more sensitive to pain, and the subjective feeling of pain may be aggravated. This may lead to a reduced ability of patients to deal with pain during rehabilitation, affecting their active participation in rehabilitation programs and activities. In addition, anxiety may also interfere with the patient's acceptance of pain management methods, making effective pain relief measures unable to exert the best effect, thereby

prolonging the recovery time (Liu et al., 2021). Anxiety may also have a negative impact on the patient's mental health and quality of life. Anxiety can increase patients' worries and fears about postoperative complications and recovery process, making it difficult for them to actively face rehabilitation challenges. Long-term anxiety may lead to depression, anxiety and other mental health problems, further affecting the speed of recovery and quality of life of patients. In this experiment, we can see that the patients in the experimental group are more ideal in terms of basic vital signs, and the overall hospitalization time and postoperative rehabilitation time of the experimental group are significantly shorter. Therefore, we believe that the preoperative anxiety management strategy of the patients with day surgery is effective in the rehabilitation of the patients (Keptner et al., 2021). Anxiety has a significant impact on the sleep of surgical patients. The stress and uncertainty of the procedure itself often results in patients being in an anxious state, which may negatively affect their sleep quality. Sleep is a key factor for physical recovery and rehabilitation, and anxiety may interfere with patients' sleep quality and sleep sleep, thereby delaying their recovery process. First, anxiety states often lead to difficulty falling asleep. Patients often face concerns, fears, and nervousness about the procedure before surgery, which not only make it difficult for them to relax, but may also trigger negative thought cycles that further exacerbate anxiety(Luber et al., 2022; Van Zanten, 2021). Difficulty falling asleep makes patients take longer to fall asleep, resulting in delayed sleep and decreased sleep quality. Second, anxiety can also lead to sleep instability. Patients in anxious states are prone to multiple nocturnal awakenings, which may be related to anxiety, nightmares, or physical discomfort. The instability of sleep will destroy the sleep structure and sleep cycle of patients, so that they cannot get enough deep sleep and REM sleep, and affect the repair and recovery of the body. In addition, anxiety may lead to decreased sleep quality in patients. Anxiety states can put patients in a state of heightened alertness, making them more sensitive to subtle changes in the environment, thereby increasing the wakefulness of sleep. Even in sleep, anxiety can cause patients to sleep shallow and easy to wake up, make them feel tired and dissatisfied, and further exacerbate their anxiety. Sleep problems have a significant impact on the speed of recovery of surgical patients. Good sleep is key to physical recovery and rehabilitation, which helps maintain immune function, promote wound healing, regulate metabolic processes, and raise pain thresholds. However, sleep problems associated with anxiety may delay recovery. Lack of sleep and decreased sleep quality can lead to physical fatigue, poor concentration, and emotional instability in patients, which in turn can affect their ability to actively participate in and execute rehabilitation programs. Therefore, for surgical patients, effective management of anxiety to improve sleep quality is essential. Preoperative anxiety management strategies can include information education, psychological support and relaxation training. Providing detailed information about surgical preparation and addressing patients'

concerns can reduce their anxiety and restlessness. Psychological support and relaxation training can help patients relieve anxiety, promote physical and mental relaxation and sleep. In addition, providing a comfortable sleep environment, good sleep hygiene and reasonable medication for patients with anxiety can also improve their sleep quality. In this experiment, it can be seen from the sleep scale that the sleep quality of patients is improved after the anxiety is controlled. The findings of this study underscore the significant benefits of implementing a targeted preoperative anxiety management strategy for athletes undergoing day surgery. The strategy not only effectively reduced preoperative anxiety but also led to improved physiological outcomes, such as lower heart rate and blood pressure, enhanced sleep quality, and reduced pain perception. These improvements contributed to a more rapid postoperative recovery, enabling athletes to return to their physical activities sooner and with greater confidence. This research highlights the critical importance of addressing the unique psychological and physiological needs of athletes in the surgical context. By incorporating elements such as sports-specific education, psychological support, relaxation techniques, and family involvement, the strategy demonstrated its capacity to holistically prepare athletes for surgery, thereby optimizing their overall recovery experience. Given the positive outcomes observed, it is recommended that this preoperative anxiety management strategy be integrated into standard care practices for athletes undergoing day surgery. Furthermore, its application could be extended to other patient populations who may benefit from enhanced preoperative care. The results of this study provide a strong foundation for future research aimed at refining and expanding anxiety management interventions to further improve surgical outcomes and the well-being of athletes.

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