

Observational Study

Nurse anesthetists' perceptions and experiences of managing emergence delirium: A qualitative study

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This study employs a descriptive phenomenological approach to investigate the challenges anesthesia nurses face in managing emergence delirium (ED), a common and complex postoperative complication in the post-anesthesia care unit. The role of nurses in managing ED is critical, yet research on their understanding and management strategies for ED is lacking.

AIM

To investigate anesthetic nurses' cognition and management experiences of ED in hopes of developing a standardized management protocol.

METHODS

This study employed a descriptive phenomenological approach from qualitative research methodologies. Purposeful sampling was utilized to select 12 anesthetic nurses from a tertiary hospital in Shanghai as research subjects. Semi-structured interviews were conducted, and the data were organized and analyzed using Colaizzi's seven-step analysis method, from which the final themes were extracted.

RESULTS

After analyzing the interview content, four main themes and eight subthemes were distilled: Inefficient cognition hinders the identification of ED (conceptual ambiguity, empirical identification), managing diversity and challenges (patient-centered safe care, low level of medical-nursing collaboration), work responsib-

ilities and pressure coexist (heavy work responsibilities, occupational risks and stress), demand for high-quality management (expecting the construction of predictive assessment tools and prevention strategies, and pursuing standardized management processes to enhance management effectiveness).

CONCLUSION

Nursing managers should prioritize the needs and suggestions of nurses in order to enhance their nursing capabilities and provide guidance for standardized management processes.

Key Words: Anesthetic nurse; Emergence delirium; Postoperative complications; Cognition; Disease management; Qualitative research

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Core Tip: This study employs a descriptive phenomenological approach to investigate the challenges anesthesia nurses face in managing emergence delirium (ED), a common and complex postoperative complication in the post-anesthesia care unit. The role of nurses in managing delirium is critical, yet research on their understanding and management strategies for ED is lacking. The findings indicate that anesthesia nurses have insufficient knowledge about ED but acknowledge the necessity for further education and have proposed numerous proactive management strategies. The study also underscores the need for management to prioritize nurse welfare to foster the growth of a high-quality care team.

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INTRODUCTION

Delirium is a neuropsychiatric-behavioral syndrome characterized by altered levels of consciousness, inattention, and disturbances in sleep-wake cycles[1,2]. Delirium occurring from the end of general anesthesia to the post-anesthesia care unit (PACU) period is defined as emergence delirium (ED) with an incidence rate ranging from 3.7% to 45.0%[3]. ED not only tends to lead to a series of adverse consequences, such as surgical incision splitting, self-removal of tubes, falling out of bed, violent behavior, *etc.*, but also increases the burden of supervision of the medical staff in the resuscitation room, and in the long term may even lead to the development of postoperative delirium, postoperative cognitive impairment and other complications[4,5]. Guidelines clearly state that nurses play a vital role in the management of delirium[6]. Nurses are capable of early identification of delirium predisposing and precipitating factors, effectively implementing handover, prevention, and management strategies for delirium by providing supportive or restorative treatments, thereby reducing the harm of delirium to patients. In intensive care units (ICUs), nurse-led delirium management has achieved significant results[7]. However, current studies mainly focus on the role of ICU nurses in delirium management within the ICU setting[8-10], with relatively limited research on the management of ED by anesthesia nurses caring for patients with rapidly changing conditions during the peri-anesthesia period. Therefore, this study employs qualitative research methods to delve into the cognitive status and management experiences of anesthesia nurses when dealing with ED patients. By understanding the issues, difficulties, and feelings they face in ED management, the aim is to provide references for the development of standardized ED training and management systems, ultimately enhancing the capabilities of anesthesia nurses in the management of ED.

MATERIALS AND METHODS

Design

This study employs the descriptive phenomenological method within qualitative research. Following a review of relevant literature domestically and abroad, as well as consultations with experts to align with the research objectives, a preliminary interview outline was developed. Two anesthetic nurses were pre-interviewed, and after discussion by the research team, the outline was revised, and the interview guide was as follows: (1) Could you please describe a memorable patient with ED? (2) How do you observe or assess the symptoms of ED in a patient? (3) In your opinion, what risk factors are likely to contribute to a patient developing ED? (4) What preventive or management measures do you take when dealing with ED? What challenges do you face? (5) How do you feel internally when dealing with a patient who has ED? and (6) How did you acquire knowledge about ED? What are your views or suggestions on this topic?

Data collection and ethical considerations

Purposeful sampling was utilized to select anesthesia nurses from a certain tertiary hospital in Shanghai as research participants from July to August 2023.

The inclusion criteria were as follows: (1) Active-duty nurses who have worked in the PACU for three years or longer; (2) Nurses who have previously provided care for ED patients; (3) Nurses who have obtained and registered their nursing practice license; (4) Nurses who are able to adequately express their inner feelings and who have given informed consent to participate in the study.

The exclusion criteria were as follows: Nurses who are on further study or rotation from other departments. Engage in advance communication with the interviewees to determine the interview schedule and location. Opt for a quiet office or lounge for a face-to-face interview and obtain consent for audio recording. Begin the interview with a self-introduction, stating the purpose and establishing a relaxed atmosphere. Utilize the interview outline for questioning while also paying attention to non-verbal cues and encouraging nurses to share their experiences. Limit the interview duration to 30 minutes, concluding when no new themes are generated from the information. The study was reviewed and approved by the Jiangnan University Medical Ethics Committee (Approval No. JNU20230301IRB16). All research participants provided informed written consent prior to registering for the study. Interviewees have the right to refuse participation or withdraw from the interview at any time, and all interviewees' data will be kept confidential.

Data analysis

Within 24 h after the interview concluded, one researcher transcribed the audio data into text and documented non-verbal information in the corresponding sections of the file. Two researchers independently analyzed, coded, and extracted themes from the data using Colaizzi's 7-step analysis method[11]. The specific analysis steps included: (1) Thoroughly read the material to fully understand the content; (2) Identify meaningful statements or descriptive sentences; (3) Organize meaningful statements into units of meaning; (4) Categorize and induct units of meaning to identify common themes; (5) Provide detailed descriptions of each theme, summarizing its characteristics and essence; (6) Derive a fundamental structure from the detailed descriptions, clarifying core content; and (7) Validate the accuracy and completeness of the fundamental structure through feedback. Following the completion of the data analysis, the researchers presented the findings back to the interviewees for verification to ensure the accuracy of the information. The general data of the interviewees were analyzed using SPSS 26.0 and are presented as mean \pm SD.

RESULTS

In total, 12 anesthesia nurses agreed to participate in this study, comprising 11 females and one male, with an average age of 36.750 years \pm 6.864 years, an average nursing tenure of 15.920 years \pm 7.833 years, and an average duration of specialty-specific work experience of 6.750 years \pm 4.245 years. **Table 1** depicts the primary sociodemographic data of the interviewees. Following data collection and analysis, four main themes and eight subthemes were identified, revealing the cognitive perceptions and management experiences of anesthesia nurses regarding the incidence of ED in postoperative patients. **Table 2** depicts the four main themes and eight subthemes of this article.

Theme 1: Inefficient cognition hinders the identification of emergence delirium

Subtheme 1 conceptual ambiguity: Anesthesia nurses exhibit some ambiguity regarding the concept of ED, and some even attribute ED to what they consider a "normal" consequence of residual anesthetic drugs during surgery.

After the patient woke up, they were non-compliant, restless, agitated, and unable to control themselves; I'm not sure if this is ED or not (No. 8).

I speculate that the most likely cause of ED is the inhalation anesthesia, as the patient has not completely metabolized the ether. Once the inhaled anesthetic agents are fully metabolized, the patient will naturally regain consciousness, and the symptoms of ED will improve (No. 6).

Subtheme 2 empirical identification: Research[12] indicates that only 1.6% of delirium cases are classified as the hyperactive subtype, while 43.5% are hypoactive, and 54.1% are present with mixed features. However, in everyday practice, anesthesia nurses tend to recognize ED primarily by its overt, hyperactive symptoms, with a noticeable deficiency in identifying hypoactive delirium. They often underestimate its incidence and lack systematic assessment awareness.

The most common type encountered involves patients twisting and turning in bed, constantly moving in an agitated manner (No. 6).

The instances of ED we usually encountered were infrequent, and hypoactive delirium was even less commonly identified. There might have been cases that went unnoticed. We typically lacked the awareness to assess whether a patient was experiencing ED (No. 4).

Furthermore, anesthesia nurses reported that they typically rely on previous empirical recognitions of specific presentations in patients with ED to make an assessment.

The manifestations of ED include being particularly agitated and uncooperative after awakening, attempting to free themselves from restraints such as intravenous lines and electrocardiogram leads, or unconsciously repeating phrases like "I need to go to the bathroom." The judgment is mainly based on the clinical presentation observed after the patient experiences ED (No. 3).

Table 1 Sociodemographic data of respondents

Number	Sex	Age	Educational background	Position	Title	Years of nursing experience (yr)	Years of specialized work (yr)
No. 1	Female	38	Undergraduate	Nurse	Senior nurse	16	6
No. 2	Female	39	Undergraduate	Nurse	Senior nurse	20	6
No. 3	Female	35	Undergraduate	Head nurse	Nurse supervisor	15	5
No. 4	Male	27	Undergraduate	Nurse	Nurse	4	4
No. 5	Female	41	Undergraduate	Nurse	Senior nurse	20	17
No. 6	Female	35	Undergraduate	Assistant head nurse	Nurse supervisor	15	5
No. 7	Female	30	Undergraduate	Nurse	Senior nurse	8	6
No. 8	Female	43	Junior college	Nurse	Senior nurse	24	14
No. 9	Female	49	Vocational school	Nurse	Senior nurse	30	6
No. 10	Female	26	Undergraduate	Nurse	Senior nurse	4	4
No. 11	Female	43	Undergraduate	Nurse	Nurse supervisor	21	3
No. 12	Female	35	Undergraduate	Nurse	Senior nurse	14	5

Table 2 Themes and subthemes of the study

Themes	Subthemes
Inefficient cognition hinders the identification of emergence delirium	Conceptual ambiguity Empirical identification
Managing diversity and challenges	Patient-Centered safe care Low level of medical-nursing collaboration
Work responsibilities and pressure coexist	Heavy work responsibilities Occupational risks and stress
Demand for high-quality Management	Expecting the construction of predictive assessment tools and prevention strategies Pursuing standardized management processes to enhance management effectiveness

Theme 2: Managing diversity and challenges

Subtheme 1 patient-centered safe care: During the interview, the anesthesia nurse stated that they always adhere to the principle of “safety first” when addressing unconscious patients’ agitated behaviors. To ensure patient safety and prevent adverse incidents such as falls from the bed or accidental decannulation, the anesthesia nurse employed a series of restraints and monitoring measures.

Firstly, immobilization is required, securing the restraint straps and closely monitoring whether the tubes might become dislodged (No. 5).

Protective measures were provided to prevent the patient’s arms or legs from hitting the bed rails (No. 6).

However, anesthesia nurses also emphasized that individual differences in patients had to be taken into account when safety measures were implemented to avoid potential negative effects, maintaining concern and sensitivity towards the patients.

The application of restraints must be situation-specific, as sometimes securing them too tightly can increase the risk of ED (No. 1).

For elderly and critically ill patients, their condition can change rapidly. Prolonged restraint can easily lead to agitation as they dislike the feeling of being confined and may even develop feelings of persecution or delusional paranoia (No. 7).

Furthermore, the enclosed and unfamiliar environment of the PACU tends to predispose patients to delirium[13]. Anesthesia nurses expressed that when dealing with patients experiencing ED, it is crucial to prioritize compassionate care. By engaging in communication, providing companionship, and offering physical touch, they actively alleviate the discomfort of the patient and facilitate a quicker emergence from the state of ED.

We soothe him through verbal communication, telling him, "Where you are today, and what you are here for (No. 2)".

I once had a conversation with a patient without the use of medication or physical restraints. I held his hand and engaged with him in his dream, diverting his attention and resulting in a quieting effect. His attention was absorbed in the narrative of his own mind, which meant his body stopped moving erratically. After patiently accompanying him for twenty minutes, he regained clarity (No. 11).

Subtheme 2 low level of medical-nursing collaboration: Anesthetic nurses have expressed that when encountering patients experiencing ED, anesthesiologists often rely on their personal clinical experience and preferences when managing the condition. If nurses are unable to quickly adapt, this can lead to a decrease in collaboration between the medical and nursing staff.

As anesthetic nurses, we mostly follow the instructions of the anesthesiologist, but each doctor has a different style, and their approach to managing ED can vary, which sometimes may not align seamlessly with the nurses' practices (No. 3).

Some physicians are reluctant to administer drugs and may prefer to allow a patient who remains unresponsive to spend more time in the PACU; others are more proactive and may prophylactically use medications; while some may decide on drug interventions based on the intraoperative medication situation (No. 2).

Meanwhile, there's some discrepancy among anesthetic nurses regarding the use of sedatives.

If a patient exhibits mild symptoms of ED, we may reassure them and observe for a while; if symptoms are more severe, we might administer a sedative, but this can lead to delayed recovery, which is undesirable. However, without medication, patients can become very agitated and behave excessively, risking injury from falling out of bed (No. 7).

Theme 3: Work responsibilities and pressure coexist

Subtheme 1 heavy work responsibilities: During the interviews, anesthesia nurses emphasized the responsibility of managing concurrent care requirements for different patients. Anesthesia nurses must not only handle the complexities of ED patients but also balance multiple tasks and needs, ensuring both the safety of patients with ED and the provision of care for others.

What we, as nurses, can do is ensure patient safety; firstly, we prevent the patient from falling out of bed or inflicting self-harm. Secondly, we try to keep the patient's mind as calm as possible because agitation can lead to unintended incidents like tube removal (No. 11).

At times like this, it's not just one person restraining or caring for them at the bedside, ensuring their safety. In the PACU, there are also other patients; while caring for him, I need to keep an eye on everyone else (No. 6).

When faced with complex scenarios and multitasking demands, anesthetic nurses indicate they prioritize the management of ED lower to ensure the important needs of other patients are met promptly and to maintain the overall synergy of the healthcare team.

During busy times in the PACU, if we focus too much energy on the patient with ED, we might not be able to fully take care of other patients (No. 6).

When patients recovering from anesthesia first wake up, we must immediately determine whether they require interventions such as extubation and suctioning. These tasks are essential and something we must address. However, ED is not an emergency situation and can be dealt with later (No. 10).

Subtheme 2 occupational risks and stress: Anesthesia nurses expressed that high levels of agitation pose a dual challenge, both endangering patient safety and requiring nurses to remain vigilant in order to prevent unforeseen incidents. This can easily lead to psychological burdens and mental fatigue for the nurses.

There is considerable pressure when dealing with the elderly in PACU at night. We fear their agitation, as it is our responsibility to prevent them from removing any medical lines. Hence, this one-hour period is constantly filled with heightened tension (No. 7).

Additionally, patients with delayed recovery disrupt subsequent surgical plans and work schedules to some degree, increasing the workload and pressure on healthcare providers.

If a patient experiences delayed recovery, our bed remains occupied, preventing the admission of subsequent patients or causing surgical delays. Consequently, we have to work overtime as well (No. 7).

Theme 4: Demand for high-quality management

Subtheme 1 expecting the construction of predictive assessment tools and prevention strategies: In this study, anesthesia nurses expressed that work in the PACU is stressful and human resources are scarce; therefore, anticipating and intervening in the early stages of ED is crucial to reducing the risk of its occurrence in patients and alleviating the workload of nurses.

If we could predict the likelihood of ED before the removal of the endotracheal tube, we wouldn't need as many staff to handle the aftermath. We could intervene early and not prolong recovery time. For instance, similar to a scale, we could assess if they are at high risk and what preventive measures should be administered to them in advance, then develop corresponding prevention strategies (No. 3).

Anesthesia nurses also believe that such tools and strategies could be integrated into the routine processes of the PACU to provide scientific and systematic guidance to healthcare professionals.

We could have a system where we take no action below a certain score, take specific measures between certain scores, and implement pharmacological treatment above a certain threshold. I think this could be incorporated as a standard procedure within the PACU (No. 12).

Due to the rapid turnover of patients in the PACU, anesthesia nurses believe that a streamlined and efficient digital assessment tool should be designed. This tool would be capable of quickly and accurately identifying patients with specific susceptibility factors, thereby enabling targeted management of those at high risk of ED.

There are two main issues with PACU patients: One is the high volume of turnover, and the other is the relatively short duration of time patients spend in recovery. For instance, young patients without any underlying health issues may not require routine screening and assessment. It's essential to screen certain populations, such as elderly patients above a certain age or according to specific thresholds (No. 6).

The scale must not be too burdensome for nurses, yet it must accurately identify patients with ED (No. 3).

The assessment tool should be as convenient as possible with the integration of information technology (No. 10).

Subtheme 2 pursuing standardized management processes to enhance management effectiveness: The development of standardized procedures plays a significant role in ensuring patient safety and improving the quality of medical services, yet there is currently a lack of standardized management protocols for ED. Anesthesia nurses believe that establishing standardized procedures will help medical staff reach a consensus, increase the efficiency of ED management, and provide patients with more standardized nursing care.

There is a lack of a standard for ED management in the PACU. Sometimes, there is a small section in the consensus among anesthesia experts, but it is not expanded upon in detail. If there is a guideline that could unify the understanding of medical staff, then the management would be more convenient and smoother in the future (No. 3).

Having such a standardized process would enable clinical medical staff to handle ED more systematically, which would greatly benefit patients. If some people do not follow the standard and instead rely on their own experience, outcomes for patients could vary greatly. If their experience exceeds the standard, it is highly beneficial for patients; however, if their experience falls below the standard, it could lead to poor outcomes for patients (No. 11).

Furthermore, the anesthesia nurses involved in this study expressed the desire for diverse and systematic training methods for ED, highlighting the urgent need for training that integrates theoretical knowledge with practical skills. The recommendations covered various educational formats, including simulation training, the establishment of delirium teams, and multidisciplinary collaboration models.

Anesthesia nurses, being specialists, require dedicated theoretical study, which is essential, and repeated clinical training is needed (No. 6).

This could be medical simulation or virtual reality. Cases could be set up in a mock operating room for nurses to experience and allow for trial and error, something not often feasible in clinical practice (No. 3).

If senior nursing management could establish systematic delirium training that then cascades to the clinical level, it would likely be better in terms of implementation and standardization. Similar to wound care groups or intravenous therapy groups, these smaller collectives can drive transformation throughout the entire hospital with their capabilities (No. 11).

Preoperative, intraoperative, and postoperative departments could collaborate to provide comprehensive and systematic management for ED patients (No. 8).

DISCUSSION

Although nurse anesthetists have received relevant learning and training, there are still deficiencies in the identification and care of ED patients. Due to the ill-defined concept of ED, the use of inaccurate terms such as "agitation" and "restlessness", as well as bedside interactions and empirical judgments of ED, nurse anesthetists' knowledge of its occurrence is relatively low. Studies[14] have shown that nurses relying only on their personal experience of observation can only accurately identify 19% of patients with delirium, and this empirical judgment substantially increases the rate of missed diagnoses. Other studies[15] have also noted that nurses' familiarity with delirium knowledge may affect early recognition and nursing intervention and that delirium recognition rates can be significantly improved by implementing educational intervention programs. Therefore, it is recommended that administrators should reinforce the training of nurse anesthetists in ED expertise. Targeted tests should be administered first to assess nurses' current level of knowledge and nursing burden, and then individualized educational curricula should be developed based on the results of the tests in the form of videos, examples of clinical practice, and interactive discussions. In addition, delirium knowledge learning channels were provided, and relevant posters were created and posted in office areas to increase knowledge dissemination[16]. Workshop model, training competition activities and clinical simulation teaching are all effective training methods to help nurse anesthetists keep up-to-date with the latest research knowledge related to ED and improve their ability and self-confidence in handling ED patients in practice. Finally, the training effects are then consolidated through continuous quality improvement programs to ensure that nurse anesthetists are able to cope with the challenges of the ED in a more professional and confident manner.

Nurse anesthetists face complex nursing issues and challenges in ED management, especially in the high-pressure environment of the PACU, where the importance of nurse anesthetists in ED management has been marginalized due to the tight staff, high workload, and low level of awareness of the ED. In addition, the prevention and treatment strategies for ED have not yet been clearly defined, the level of healthcare cooperation is low, and doctors and nurses take pharmacological or non-pharmacological management measures mainly based on their personal clinical experience when dealing with it. A mature ED management system has not yet been established in China, so there is an urgent need to establish a standardized process. The establishment of this standardized process requires the support of the organizational system. Relevant administrators should build ED assessment and management norms based on evidence-based practices and hospital characteristics. To ensure the implementation of the norms, hospitals need to appropriate medical manpower

and resources are needed, and the norms should be included in the quality control management indicators. At the same time, it is recommended that an electronic ED processing board be constructed and integrated into the medical order processing system for monitoring, evaluating, and recording symptoms, as well as to supervise the full implementation of ED assessment and management by nurse anesthetists. To improve teamwork and the quality of ED management, ED management teams can be established. In a study by Morandi *et al*[17], an interdisciplinary delirium management prevention program effectively reduced nurses' workload by developing individualized treatment and follow-up plans through comprehensive assessment. In addition, nonpharmacological treatment is the primary measure of ED treatment [18], so nurse anesthetists should take a leading role in ED nonpharmacological management. Through the construction of nursing norms, the establishment of organizational systems and standardized steering groups, nursing managers can promote the practical application of these changes in the clinical setting. This is important for improving patient prognosis and enhancing the quality of care.

This study found that anesthetic nurses have limited attention to ED, focusing mainly on the diagnosis and treatment stages while neglecting effective prevention of ED. Related research[14] indicates that up to 40% of delirium cases are potentially preventable. Risk prediction models, as a scientific, statistical assessment method, play a significant role in evaluating and identifying early high-risk populations[19]. Xing *et al*[20] constructed a postoperative delirium risk prediction model with an accuracy rate of up to 92%, which exhibits excellent performance in the early identification of high-risk groups, providing a basis for medical staff to take timely preventive treatments and care. Cao *et al*[21] built an early risk stratification model through the E-PRE-DELIRIC theory, successfully reducing the incidence of delirium in ICU patients, reducing the rate of adverse drug reactions, and shortening the ICU stay of patients. Hence, it is recommended that researchers should formulate ED risk warning models based on perioperative anesthesia and surgery-related risk factors, combined with the specific risk factors of PACU, and conduct risk stratification. The risk warning model for ED should be used during the perioperative period to assess the risk of ED, identify high-risk patients, and develop personalized prevention strategies based on corresponding risk factors. This includes actively taking supportive or restorative treatment measures, ensuring prevention, handover, and management of ED, securing patient safety and recovery, and improving the quality of ED management. In the context of limited medical resources, the ED risk warning model can also help medical staff identify high-risk patients who may need more attention and resource allocation, enhancing the efficiency of medical resource utilization and alleviating the burden of subsequent treatment. This systematic prevention strategy is expected to effectively reduce the incidence of ED and improve the overall quality of patient care.

The nursing care for patients with ED is complex, and the simultaneous needs of other patients, combined with limited human resources, impose dual physical and psychological pressures on anesthetic nurses. Domestically, anesthetic nurses face issues of ambiguous job responsibilities, unclear business scopes, and uneven distribution of human resources[22], leading to excessive workload, which in turn lowers job satisfaction and increases turnover rate. Therefore, administrators need to focus on optimizing the management and resource allocation of the anesthesia operation rooms to ensure reasonable work arrangements and nurse-to-patient ratios. Researchers[15] suggest that, in critical care units, the nurse-to-patient ratio should fluctuate between 1:1 and 1:3. Especially in the presence of patients with delirium, a nurse should be specifically assigned to care for the delirious patients to ensure individualized and close monitoring, alleviate the workload of other nurses, and enhance the quality of care as well as the utilization of medical resources. Furthermore, managers should also focus on incentive mechanisms, as low job control and high job demands can reduce job satisfaction among nurses[23]. Granting anesthetic nurses a certain degree of autonomy, rewards, and opportunities for professional development and clarifying their responsibilities and authority while encouraging the standard procedure for ED treatment can elevate the level of motivation among anesthetic nurses, thereby enhancing patient satisfaction and the quality of nursing services. Nursing managers should actively listen to the concerns and issues of anesthetic nurses, providing constructive feedback and suggestions. Implementing stress management strategies such as psychological health counseling, health promotion activities, and flexible work arrangements can help alleviate work pressure. Lastly, nursing managers may introduce effective stress relief strategies such as mindfulness-based stress reduction and the formation of Balint groups[24]. The former relieves stress by focusing on present sensations and emotions, while the latter is a form of social support that provides understanding and backing to nurses by sharing workplace challenges and pressures among colleagues. These methods have been demonstrated to positively reduce nurse stress and improve job satisfaction. Therefore, anesthetic nurses should pay attention to personal stress management and proactively adopt these strategies to promote their physical and emotional wellbeing.

The innovative aspect of this research lies in the application of qualitative methods to explore the perceptions and management experiences of anesthesia nurses in handling patients with ED from their own perspective. By engaging in face-to-face communication, the study delves deeply into the challenges, difficulties, and emotions anesthesia nurses encounter during the management of ED, thereby enriching the body of research in the field of ED. The limitations of this study are attributed to the low proportion of male nurses in the clinical setting which resulted in the inclusion of only one male nurse in this research. Consequently, the perspectives and viewpoints of male nurses are underrepresented. Future research should consider increasing the number of interviews with male nurses. In addition, subsequent studies could reference the findings of this research to develop standardized, information-driven tools and procedures for the assessment and management of ED, which can be implemented in clinical practice for the benefit of patients.

CONCLUSION

This study employed semi-structured interviews to deeply explore the experiences of anesthetic nurses in the cognition and management of ED. The findings revealed that inefficient cognitive patterns impede the timely detection and

management of ED, highlighting the challenges anesthetic nurses face in managing the complexity and variability of conditions, the trade-offs and coping strategies between work responsibilities and load, and the anesthetic nurses' anticipation for more diversified management approaches. Addressing these issues, researchers believe it is crucial to prioritize the physical and mental health of nurses and suggest improvements in the following areas: first, strengthening professional knowledge training to enhance nurses' cognition of ED and providing them with more effective tools and strategies. Secondly, standardizing the ED management processes will establish a systematic and scientific management model to deal with the variability of ED and enhance management efficiency. Additionally, building early warning models and developing corresponding prevention strategies can help to identify high-risk patients in advance, effectively reducing the incidence of ED. Lastly, hospital management should pay attention to nurses' work environment and psychological state, meeting their expectations for management approaches in more humanized and diversified ways, thereby improving their work experience. Therefore, through comprehensive improvement measures, we can expect to manage ED patients more effectively, raise the quality of care, and promote the sustainable development of healthcare services.

ARTICLE HIGHLIGHTS

Research background

The emergence delirium (ED) is a common postoperative complication in the post-anesthesia care unit, representing a significant management challenge. Given the vital role of nurses in the management of delirium, it is crucial to explore the experiences and challenges of anesthesia nurses in managing ED.

Research motivation

Currently, the issues and perspectives of anesthesia nurses in the management of ED are not well understood. Therefore, this study adopts a qualitative research approach to thoroughly explore the cognition and experiences of anesthesia nurses in managing ED patients.

Research objectives

To understand the issues, challenges, and experiences faced by anesthesia nurses in managing ED, with the aim of providing a reference for the development of standardized ED training and management systems and enhancing the abilities of anesthesia nurses in ED management.

Research methods

A descriptive phenomenological research method was employed in this study, using purposive sampling to select anesthesia nurses for face-to-face semi-structured interviews. The collected data were then analyzed and thematic findings were derived using the Colaizzi's seven-step analysis approach.

Research results

Anesthesia nurses are currently lacking theoretical knowledge in addressing ED, and their practical handling of such patients has not reached a proficient level, leading to significant physical and mental stress. However, they have shown great enthusiasm for learning about and managing ED and have put forward multiple constructive opinions and suggestions, which are worth drawing inspiration from and learning.

Research conclusions

Nursing managers should pay full attention to the cognitive and management experiences of anesthesia nurses in managing patients with ED, by strengthening knowledge learning, establishing standardized management systems, developing early warning strategies, and promoting physical and mental well-being. This will enhance the abilities of anesthesia nurses in ED care and provide helpful guidance in formulating standardized management protocols for ED.

Research perspectives

Future research can develop detailed and standardized protocols for managing ED based on the recommendations of this study and apply them in clinical practice.

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FOOTNOTES

Co-first authors: Yi Xin and Fu-Cai Lin.

Co-corresponding authors: Rui Li and Guang-Ming Zhang.

Author contributions: Xin Y, Lin FC, Zhang GM, and Li R contributed to the research design and thesis writing; Xin Y, Lin FC, and Huang C collected and analyzed the data; Xin Y, He B, Wang S, and Yan YL contributed to the data collection; Zhang GM and Li R overall supervise the study; and all authors contributed to the article and approved the submitted version. The reasons for designating Xin Y and Lin FC as co-first authors are twofold: Firstly, both co-first authors jointly contributed to experimental design, data collection, and analysis, playing a crucial role in ensuring the reliability and validity of the research. Secondly, both co-first authors collaborated in writing and revising the research paper, thereby enhancing the overall quality of the manuscript. The reasons for designating Li R and Zhang GM as co-corresponding authors are threefold: Firstly, they possess expertise in the fields of anesthesiology and nursing, providing crucial professional support and advice for the research. Secondly, they serve as leaders and mentors within the research team, playing significant organizational and guidance roles throughout the entire research project. Lastly, their contributions to the review and revision of this manuscript are equal. In summary, the co-first authors and co-corresponding authors of this study, by analyzing and presenting the research content from multiple professional perspectives, ensured the breadth and depth of the research findings.

Institutional review board statement: The study was reviewed and approved by the Jiangnan University Medical Ethics Committee (Approval No. JNU20230301IRB16).

Informed consent statement: All study participants or their legal guardians provided informed written consent prior to study enrollment.

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