



Original Article

Information Needs and Influencing Factors of Accompanying Family Members of Children in the Post Anesthesia Care Unit during Recovery

Yuerong Zhang¹, Aihua Liu¹, Xinru Xiang², Yueqiang Mo³

¹Children's Hospital of Fudan University, Department of Anesthesiology, Wanyuan Road 399, Minhang District, Shanghai, China 201102

²School of Nursing, Fudan University, Fenglin Road 305, Xuhui District, Shanghai, China 200433

³Children's Hospital of Fudan University, Department of Orthopaedics Surgery, Wanyuan Road 399, Minhang District, Shanghai, China 201102

*Corresponding Author: Yueqiang Mo

Abstract:

Objective: To investigate the information needs of accompanying family members during the pediatric post-anesthesia recovery period and to analyze the factors influencing these needs, thereby providing a baseline for optimizing perioperative nursing management.

Methods: A structured questionnaire was developed, encompassing demographic data of the children and their caregivers, as well as specific information needs related to the recovery period (e.g., Post-Anesthesia Care Unit [PACU] policies, location, and vital signs). A cross-sectional survey was conducted among 217 family members of children undergoing general anesthesia at our center from October 2023 to April 2024.

Results: Caregivers demonstrated a high demand for information regarding anesthesia recovery, with all items scoring >4 on a 5-point Likert scale. The highest-rated need was "understanding possible complications during recovery" (4.65±0.60), while "location of the PACU" received the lowest score (4.36±0.92). Multiple linear regression analysis identified the caregiver's living arrangement with the child, the child's age, and whether it was the child's first experience with general anesthesia as significant influencing factors (P < 0.05).

Conclusion: Family members have substantial information needs during the pediatric anesthesia recovery period. Targeted guidance and proactive communication are essential to enhance caregivers' coping strategies and provide robust family support for the child's recovery.

Keywords: Children; Recovery period after Anesthesia; Accompanying family members; Information needs; Influencing factors

Introduction

General anesthesia is the most common anesthetic method used in pediatric surgery. Following the procedure, children enter the Post-Anesthesia Care Unit (PACU) for a recovery period typically lasting about 60 minutes. Once fully awake and

meeting discharge criteria, they return to the ward to reunite with their family members. Due to the restricted location and environment of the PACU, many people perceive anesthesia recovery with a sense of mystery and a strong desire for information [1]. The separation of children from

their parents during the perioperative period not only causes fear and anxiety in the children but also distresses the family members waiting outside the operating room. The cognitive and emotional states of these family members can significantly impact the child's recovery [2].

Recent studies have emphasized that parental anxiety is a significant predictor of preoperative and postoperative distress in children, often leading to a higher incidence of emergence delirium and prolonged recovery times [3]. The Post-Anesthesia Care Unit (PACU) represents a critical transition phase where the lack of direct communication can exacerbate this anxiety. Family-centered care (FCC) models advocate for the active involvement of parents in the perioperative process, suggesting that well-informed caregivers can serve as a vital resource in calming the child and facilitating a smoother transition from anesthesia [4]. Furthermore, multicomponent preparation, including digital information tools and structured educational sessions, has been shown to effectively reduce both child and parental anxiety, yet its implementation in the recovery phase remains inconsistent [5].

With the advancement of pediatric anesthesia comfort care and family-centered care models, the information needs of family members are increasingly prioritized. Medical staff provide information support to promote the positive role of families in children's health [6, 7]. This study analyzes the needs and influencing factors of family members during the pediatric recovery period to provide a baseline for subsequent nursing care and health education activities.

Methods

Study Design and Participants

This study was approved by the institutional review board of our hospital (Approval No. 2023048), and informed consent was obtained from all participating parents. The study included

217 family members accompanying children scheduled for general anesthesia surgery at our hospital from October 2023 to April 2024. Inclusion Criteria: Children classified as ASA (American Society of Anesthesiologists) I to II; elective surgery with planned postoperative entry into the PACU; family members willing to participate. Exclusion Criteria: Children without accompanying family members; family members with communication barriers; family members too emotionally distressed to cooperate.

Research Instruments

The questionnaire was designed based on a literature review and expert guidance. Its internal consistency and validity were assessed, yielding a Cronbach's alpha of 0.92 and a content validity index of 0.96 (determined by five experts in pediatric surgery, the operating room, and anesthesiology). The questionnaire consisted of two parts:

- (1) General information, including the child's gender, age, disease, whether they were an only child, and whether it was their first time undergoing general anesthesia; family members' gender, age, relationship with the child, occupation, educational level, whether they lived with the child long-term (more than 6 months), whether they have used anesthetic drugs, whether they understood anesthesia recovery, and whether they had accompanied a child during the recovery period after general anesthesia, totaling 15 items.
- (2) Needs section, including the location of the PACU, discharge time, waiting area, environment and policies, the emotional state of the child, the impact of anesthetic drugs on the child, the child's recovery progress during the recovery period, and related complications, totaling 8 major items. All items were rated from "strongly agree" to "strongly disagree," scored from 5 to 1 points, with higher scores indicating stronger needs.

Data Collection

The questionnaire was distributed using the

Questionnaire Star platform (an applet of WeChat). Before surgery, data were collected face-to-face with family members who met the inclusion and exclusion criteria, process was explained, informed consent was signed. A total of 217 questionnaires were distributed, with a 100% recovery rate.

Statistical Analysis

SPSS 20.0 was used for organizing and analyzing the data. General information was described using frequency and composition ratios. Normally distributed measurement data were described using means and standard deviations. Multiple linear regression analysis was used to analyze the influencing factors, with $P < 0.05$ considered statistically significant.

Results

General Information

Among the 217 children, there were 124 boys (57.14%) and 93 girls (42.86%), with 110 being an only child, accounting for 50.69%. The children's ages ranged from 2 months to 16 years, with the highest proportion being 4 to 6 years (30.88%), and the lowest proportion being under 1 year old (10.14%). Diseases involved multiple departments such as general surgery, orthopedics,

urology, oncology, cardiothoracic surgery, and otolaryngology, with 74.19% of the children undergoing general anesthesia surgery for the first time. The age range of the accompanying caregiver was 26 to 59 years, with 174 females (80.18%) and 43 males (19.82%). The educational level of the family members was college or higher for 64.06% and junior high school and below for 14.75%. 60.83% of the accompanying family members had used anesthetic drugs before, 72.81% had a permanent residence in the city, 73.73% lived with the child long-term, and 71.89% were parents of the child. 3.69% of the family members had experience accompanying a child during the recovery period after general anesthesia.

Needs of Accompanying family members

The results showed that family members had a strong need for information related to the child's recovery, with average scores for each item being >4 points. The item "I need to understand the possible complications during my child's recovery" scored the highest, at (4.65 ± 0.60) points, while "I need to know the location of the anesthesia recovery room" scored the lowest, at (4.36 ± 0.92) points.

Table 1: The needs of accompanying family members during the resuscitation of children after general anesthesia. (n=217)

Information	Score($\bar{x} \pm s$)
Location of PACU	4.36±0.919
The time for my child to emerge from PACU	4.51±0.701
The waiting area before leaving PACU	4.49±0.714
Environment and Regulations in PACU	4.37±0.868
The emotional state of my child	4.53±0.776
Inform me of the effects of anesthesia drugs on my child proactively	4.60±0.688
Recovery of the child	4.61±0.693
Complications that may occur during the resuscitation period	4.65±0.600
Total Score	36.120±5.179

Influencing Factors

Using the score of family members' information needs as the dependent variable and the 15 items of general information about the child and family members as factors, univariate ANOVA tests were conducted. The results showed that the scores of family members' information needs were statistically significant in terms of the

educational level of the accompanying family members, whether the family member had used anesthetic drugs, whether the family member understood the anesthesia recovery period, whether they lived with the child, the relationship between the family member and the child, the child's age, and whether the child was undergoing general anesthesia surgery for the first time ($P < 0.05$).

Table2: A univariate analysis of influencing factors

Variable	Groups	Frequency	Scores ($\bar{x} \pm s$)	F Value	PValue
Education level of AFM	Junior high school and below	32	11.19±4.177	5.644	0.004
	high school or vocational school	46	14.11±7.282		
	college degree or above	139	11.30±4.320		
History of anesthetic medication usage of AFM	Yes	132	10.69±4.137	19.329	0.000
	No	85	13.73±6.048		
Awareness the course of postoperative recovery	Yes	65	10.62±4.383	5.654	0.018
	No	152	12.42±5.407		
Whether live with the child for a long time	Yes	160	10.34±3.202	70.988	0.000
	No	57	16.19±6.976		
Relationship with the child	Parents	156	10.63±3.562	37.989	0.000
	Not Parents	61	15.08±7.020		
Age of the child	≤3 years	72	12.59±4.777	3.657	0.013
	4~6 years	67	12.86±5.965		
	7~10 years	49	12.60±5.771		
	>10 years	29	10.26±3.685		
Whether the child underwent general anesthesia for the first time	Yes	161	11.03±3.653	18.101	0.000
	No	56	14.32±7.637		

AFM: Accompanying Family Members

Using the score of information needs of family members during the recovery period after general anesthesia as the dependent variable and the variables that were statistically significant in univariate analysis as independent variables, a regression model was fitted, and multiple linear regression analysis was conducted. The study

results showed that whether the family member lived with the child long-term, the child's age, and whether the child was undergoing general anesthesia surgery for the first time were the main influencing factors for the information needs of accompanying family members during the recovery period ($P < 0.05$).

Table3: Multivariate linear regression analysis of influencing factors

variable	Unnormalized coefficient		Normalized coefficient	t value	Significance	95.0% CI of B
	B	Standard error	Beta			
(Constant)	1.078	2.039		-0.529	0.597	-5.097~2.941
Education level of AFM	0.450	0.406	-0.064	-1.109	0.269	-1.251~0.350
History of anesthetic medication usage of AFM	1.094	0.651	0.103	1.681	0.094	-0.189~2.377
Awareness the course of postoperative recovery	1.061	0.645	0.094	1.645	0.101	-0.210~2.333
Whether live with the child for a long time	4.600	0.873	0.392	5.268	0.000*	2.878~6.321
Relationship with the child	0.822	0.857	0.072	0.959	0.339	-0.868~2.511
Age of the child	0.575	0.257	0.131	2.241	0.026*	0.069~1.081
Whether the child underwent general anesthesia for the first time	1.696	0.694	0.144	2.445	0.015*	0.329~3.063

AFM: Accompanying Family Member. $R^2=0.339$, $\Delta R^2=0.317$, F value=15.296, * $P<0.05$

Discussion

The survey indicated that family members had a strong need for information in each item. It is recommended that high-quality nursing service projects for children during the perioperative period be carried out in the future, with more attention paid to the information needs related to the recovery period after general anesthesia. Timely provision of relevant information to the family members of the children, such as possible complications during the child's recovery, the impact of anesthetic drugs on the child, and the child's emotional state during recovery, can improve the family members' psychological coping ability and self-efficacy. Among them, "I need to understand the possible complications during my child's recovery" scored the highest and had the strongest need. During the hospitalization treatment process, family members pay more attention to changes in the condition, treatment, and prognosis [8]. Although

there is a wide range of information sources on the internet, parents still rely more on the information provided by the hospital [9].

This reliance on hospital-provided information underscores the critical role of clinicians in bridging the 'information gap.' Studies have shown that when parents receive structured, evidence-based information about potential complications like emergence agitation or postoperative nausea and vomiting (PONV), their perceived self-efficacy in supporting their child increases significantly [10]. This is particularly important in the PACU, where the environment is often perceived as high-stress and unfamiliar. Effective communication strategies, such as the use of visual aids or digital platforms, can help demystify the recovery process and align parental expectations with clinical realities [11].

The study showed that the information needs of family members who did not live with the child long-term were higher than those who did. family

members who did not live with the child long-term have a lot of uncertainty about their own coping ability during the perioperative period, are not familiar with the specific situation of the patient, lack care-giving experience, and have higher support and information needs from the outside world [12]. In this study, among the family members who lived with the child long-term, 88.13% were parents, and only 11.87% were grandparents, which may have an interactive effect on the study results due to differences in age cognition. Therefore, this factor needs further study with a uniform research subject.

The study indicated that family members of children under 10 years old had higher information needs than those of adolescents, with the lowest score for information needs among family members of children over 10 years old. This may be related to the decreased dependence on family members and increased independence of adolescents over 10 years old [13]. For family members of children under 10 years old, the study results showed that the highest need score was for family members of children aged 4 to 6 years old, while the need score for family members of children under 3 years old was actually lower. This is different from the study by Li Shuangzi *et al.* [14], which indicated that the younger the child, the weaker the family members' caregiving and coping ability, and the stronger the need for information related to the condition during hospitalization. The reason for this could be that the research subjects in this study were between 2 months and 16 years old, and the lack of research on family members of infants under 2 months may have caused the lower need score for family members in the ≤ 3 -year-old age group. Additionally, some researchers have pointed out that the incidence of adverse behaviors (such as anxiety and restlessness) during the perioperative period is relatively high in preschool children aged 4 to 6 years old, and family members at this stage tend to be more confused and insecure,

hoping to obtain more information to promote the health and development of the child [15, 16].

The heightened needs of parents with preschool-aged children (4-6 years) may also be attributed to the developmental stage of the child, where separation anxiety is often at its peak. Research indicates that children in this age group are more prone to 'emergence delirium,' a state of acute confusion and agitation upon awakening from anesthesia, which can be highly distressing for unprepared parents [17]. Providing targeted information that explains these behaviors as common and temporary can significantly mitigate parental distress and prevent the 'anxiety loop' between the caregiver and the child [18].

The study showed that family members of children undergoing general anesthesia surgery for the first time had higher information needs during the recovery period. Researchers have pointed out that the degree of fear of the unknown is related to the first treatment [19]. Family members of children undergoing general anesthesia surgery for the first time have more cognitive gaps and a stronger need for medical information.

At different stages of the perioperative period, patients and family members face different fears and pressures, and the unknown aspects of surgery and anesthesia increase their anxiety and information needs [20]. The extent of nursing health education practice is closely related to the assessment of family members' information needs. It is necessary for nurses to accurately assess the needs of parents, and interdisciplinary information sharing is very important to meet the information needs of parents [21]. Providing appropriate and timely information can give patients and family members knowledge, reducing the anxiety and stress associated with hospitalization. Preferences for information content vary among different patient families [22]. The information needs of family members accompanying children during the recovery

period after general anesthesia are strong, and providing support and guidance related to the condition during the anesthesia recovery period can help improve the quality and effectiveness of nursing health popularization practice. For those family members who have not lived with the child long-term, children under 10 years old (especially preschool children), and children undergoing general anesthesia surgery for the first time, more attention should be paid, and targeted, individualized information about the peri-anesthesia period should be provided. Face-to-face popular science education can increase the opportunity for family members to ask questions and clarify doubts, making up for some missing information points, and at the same time, correcting cognitive biases caused by inaccurate information from the internet.

Conclusion

The information needs of family members during the recovery period of children after general anesthesia are strong. It is necessary to provide targeted guidance related to the condition during the anesthesia recovery period, to enhance their coping ability, and to provide family support for the child's recovery.

Acknowledgment

None

Conflicts of Interest

The authors report no actual or potential conflicts of interests.

Funding statement

Fudan Fuxing Nursing Research Foundation (FNF202346).

Authors' contributions

Yuerong Zhang: Conceptualization, Data curation, Formal analysis, Writing-Original draft

Aihua Liu: Investigation, Writing-review & editing, Data curation, Formal analysis

Xinru Xiang: Investigation, Writing-review & editing, Data curation, Formal analysis

Reference:

1. Luo Dan, Yang Suxia, Liu Qiuxing, & Lu Meihua (2021). Progress of resuscitation room escort mode in children's recovery from general anesthesia. *Perioperative Safety and Quality Assurance*, 5(06):469-471.
2. Jenkins, B. N., Fortier, M. A., Stevenson, R., Makhoulf, M., Lim, P., Converse, R., & Kain, Z. N. (2019). Changing healthcare provider and parent behaviors in the pediatric post-anesthesia-care-unit to reduce child pain: Nurse and parent training in postoperative stress. *Paediatric anaesthesia*, 29(7), 730-737. <https://doi.org/10.1111/pan.13649>
3. Lööf, G., & Lönnqvist, P. A. (2022). Role of information and preparation for improvement of pediatric perioperative care. *Paediatric anaesthesia*, 32(5),600-608. <https://doi.org/10.1111/pan.14419>.
4. Seniwati, T., Rustina, Y., Nurhaeni, N., & Wanda, D. (2023). Patient and family-centered care for children: A concept analysis. *Belitung nursing journal*, 9(1), 17-24. <https://doi.org/10.33546/bnj.2350>.
5. Mendoza, B. A., Fortier, M. A., Trinh, L. N., Schmid, L. N., & Kain, Z. N. (2021). Factors impacting parental and child satisfaction in the perioperative setting. *Paediatric anaesthesia*, 31(9),932-943. <https://doi.org/10.1111/pan.14236>.
6. Xu Qiang, Wu Qing-ping (2012). The comfort-enhancing technology of pediatric anesthesiology. *Int J Anesth Resus*, 33 (2):115-118.
7. Chen Jianjun, Zhang Dahua & Ma Xiuzhi (2012). The application of "family-centered" nursing model in pediatric clinical nursing. *Chinese Nursing Management*, 12(8):12-14.
8. Xu Yanlin, Zheng Yanping, & Li Dongmei (2004). A survey of family members' demands of patients kept observation in emergency

- department. *Nursing Research*, 18(18):1616-1617.
9. Kennedy, M., & Howlin, F. (2022). Preparation of children for elective surgery and hospitalisation: A parental perspective. *Journal of child health care : for professionals working with children in the hospital and community*, 26(4), 568–580. <https://doi.org/10.1177/13674935211032804>.
10. Bogusaite, L., Razlevice, I., Lukosiene, L., & Macas, A. (2018). Evaluation of Preoperative Information Needs in Pediatric Anesthesiology. *Medical science monitor : international medical journal of experimental and clinical research*, 24, 8773–8780. <https://doi.org/10.12659/MSM.910734>.
11. Ayenew, N. T., Endalew, N. S., Agegnehu, A. F., & Bizuneh, Y. B. (2020). Prevalence and factors associated with preoperative parental anxiety among parents of children undergoing anesthesia and surgery: A cross-sectional study. *International Journal of Surgery Open*, 24, 18-26. <https://doi.org/https://doi.org/10.1016/j.ijso.2020.03.004>.
12. Zhang Huimin, Gao Jie, & Zhang Nan (2019). Nursing experiences of family family members of stroke patients : a systematic review of qualitative studies. *Nursing Research*, 33(19):3308-3324.
13. Sawyer, S. M., Azzopardi, P. S., Wickremarathne, D., & Patton, G. C. (2018). The age of adolescence...and young adulthood - Authors' reply. *The Lancet. Child & adolescent health*, 2(4), e7. [https://doi.org/10.1016/S2352-4642\(18\)30075-0](https://doi.org/10.1016/S2352-4642(18)30075-0).
14. Li Shuangzi, Zhang Ping, & Wang Ting (2021). Investigation and analysis of continuing care needs of children with epilepsy of different types and ages. *CHINESE EVIDENCE-BASED NURSING*, 7(7):924-928.
15. Bertule, D., & Vetra, A. (2014). The family needs of parents of preschool children with cerebral palsy: the impact of child's gross motor and communications functions. *Medicina (Kaunas, Lithuania)*, 50(6), 323–328. <https://doi.org/10.1016/j.medic.2014.11.005>
16. Jin Yuexi, Wu Wenxin, & Jiang Wanna (2019). Efficacy of combination of multiple measures in preventing agitation during recovery from general anesthesia in preschool children. *Chinese Journal of Anesthesiology*, (4):401-404.
17. Ye Jianfang, et al. (2022). Application effect of interest-oriented induction intervention model in preschool children undergoing general anesthesia. *Journal of Clinical Nursing*, 21(4):52-55.
18. Torres, Jaymie Riza, Lazaro, Franchesca Isabelle Andaya (2025). The Impact of Parental Presence on Pediatric Recovery Outcomes Following Invasive Procedures or Surgery. *Nursing | Senior Theses*. 215. <https://doi.org/10.33015/dominican.edu/2025.NURS.ST.52>
20. Srinivasan, D., Senthil, D., Senthil Eagappan, A. R., Rajesh, P., Prakash, K. S., & Shanmugavadivel, G. (2022). Evaluation of the mother's anxiety and child's fear in two different age groups in the child's first and second dental visit. *Indian journal of dental research: official publication of Indian Society for Dental Research*, 33(2), 126–129. https://doi.org/10.4103/ijdr.IJDR_256_20.
21. Qiu H R, Tian S Y, & Ye T H (2012). An audit of perioperative fluid management and electrolyte monitoring in children undergoing surgery for scoliosis. *Zhonghua Yi Xue Za Zhi*, 92(13):868-872.
22. Hashimoto, H., Takahashi, K., & Imai, Y. (2023). Nursing practice to fulfill the information needs of parents of hospitalized children with cancer and related factors. *Journal of pediatric nursing*, 72, e98–e104. <https://doi.org/10.1016/j.pedn.2023.06.015>.
23. Kynoch, K., Ramis, M. A., Crowe, L., Cabilan, C. J., & McArdle, A. (2019).

Information needs and information seeking behaviors of patients and families in acute healthcare settings: a scoping review. *JBIR*

database of systematic reviews and implementation reports, 17(6),1130–1153. <https://doi.org/10.11124/JBISRIR-2017-003914>.