American Journal of
Biomedical Science & Research

www.biomedgrid.com
ISSN: 2642-1747

Review Article

Application Effect of Game Intervention in Preoperative Anxiety Management of Hospitalized Children Undergoing Fiberoptic Bronchoscopy

Dong Pei*, Li Xiao Li, Lei Dong Hong, Yanfan, Wang Qiao Qiao, Li Duo, Dang Yan Chun

Dong Pei, Li Xiao Li, Lei Dong Hong, Yanfan, Wang Qiao Qiao, Li Duo, Dang Yan Chun*

***Corresponding author:** Dong Pei, Department of Pediatrics, Yulin No.1 Hospital, Yulin, Shaanxi 718000, China.

To Cite This article: *Dong Pei*, Li Xiao Li, Lei Dong Hong, Yanfan, Wang Qiao Qiao, Li Duo, Dang Yan Chun, Application Effect of Game Intervention in Preoperative Anxiety Management of Hospitalized Children Undergoing Fiberoptic Bronchoscopy. Am J Biomed Sci & Res. 2026 31(6) AJBSR.MS.ID.004105,* **DOI:** 10.34297/AJBSR.2026.31.004105

Received: August 05, 2026 **Published:** August 17, 2026

Abstract

Objective: To explore the application effect of multi-form game intervention in preoperative anxiety management of hospitalized children receiving fiberoptic bronchoscopy, so as to provide practical basis for perioperative psychological nursing of pediatric invasive procedures.

Methods: A total of 40 children scheduled for fiberoptic bronchoscopy examination or treatment in the Department of Pediatrics of our hospital from October 2025 to March 2026 were selected and divided into an intervention group and a control group via random number table method, with 20 cases in each groups. The control group received routine preoperative nursing, while the intervention group adopted multi-form and phased game intervention combined with child-friendly ward environment on the basis of routine nursing. The two groups were compared in terms of preoperative anxiety score, compliance with anesthesia induction, intraoperative vital sign fluctuation and family satisfaction.

Results: The anxiety score of the intervention group 30 minutes before operation was significantly lower than that of the control group ($P<0.05$). The total compliance rate of anesthesia induction in the intervention group was higher than that in the control group ($P<0.05$). The fluctuation ranges of heart rate and blood pressure during operation were smaller in the intervention group ($P<0.05$). The family satisfaction score of the intervention group was markedly higher ($P<0.05$).

Conclusion: multi-form game intervention can effectively relieve preoperative anxiety of children undergoing fiberoptic bronchoscopy, improve their compliance with anesthesia, stabilize intraoperative vital signs, optimize medical experience and raise family satisfaction. This intervention is easy to operate and low-cost, which is worthy of popularization in preoperative nursing of pediatric invasive procedures.

Keywords: Game intervention, Pediatrics, Fiberoptic bronchoscopy, Preoperative anxiety, Anaesthesia compliance

Introduction

Fiberoptic bronchoscopy is a vital invasive procedure for the diagnosis and treatment of pediatric respiratory diseases. Due to young age and limited cognitive ability, children have intense fear of airway stimulation, sense of suffocation and unfamiliar medical environment, leading to a high incidence of preoperative anxiety. They may cry, resist and restlessly struggle, which not only

reduces compliance with anesthesia, but also causes drastic heart rate fluctuations, increasing operational risks and postoperative complications.

Routine preoperative nursing mainly consists of verbal health education and simple comfort, with single forms that fail to fit children's concrete thinking patterns, resulting in limited anxiety relief effects. Game intervention conforms to children's physical and mental development rules. It can divert children's attention through interesting interactions, alleviate fear and build positive cognition. In this study, we integrated child-friendly environment with multi-form games for preoperative anxiety management of children receiving fiberoptic bronchoscopy and observed its clinical effects. The report is as follows.

Materials and Methods

General Data

Forty children scheduled for elective fiberoptic bronchoscopy examination or treatment in the Department of Pediatrics of our hospital from October 2025 to March 2026 were enrolled and divided into intervention group and control group (20 cases each) by random number table.

Inclusion criteria: aged 3–12 years old; elective fiberoptic bronchoscopy; clear consciousness without cognitive or mental disorders; informed consent obtained from children and their families.

Exclusion criteria: emergency procedures; severe cardiopulmonary insufficiency; previous anxiety, autism and other psychological disorders; inability to cooperate with intervention and evaluation.

There were no statistically significant differences between the two groups in gender, age, disease condition, type of procedure and other general data ($P>0.05$), indicating comparability. This study was approved by the Medical Ethics Committee of our hospital.

Intervention Methods

Control Group

Routine preoperative nursing was carried out as follows:

a. Preoperative ward visit by responsible nurses one day before operation, explaining the purpose, process, anesthesia mode, fasting and water deprivation requirements and key cooperation points of fiberoptic bronchoscopy.

b. Answering questions from family members and conducting routine psychological comfort.

c. Escorting children to the operation room before operation, allowing family members to accompany until anesthesia induction.

Intervention Group

On the basis of routine nursing, multi-form and phased game intervention was implemented:

a) **Child-friendly environment transformation**

Cartoon wallpapers and child-themed stickers were pasted on corridor walls of wards, and a dedicated game corner was set up. Soft lighting and warm-coloured soft furnishings were adopted. Floor games including number hopscotch, Chinese zodiac hopscotch, cat hopscotch, colour recognition hopscotch, initial consonant hop games, frog long jump, rock-paper-scissors, good behavior flying chess, fire safety flying chess, drowning prevention flying chess and 24 solar terms cognitive stickers were laid out to build a warm and interesting diagnosis and treatment environment, eliminating children's tension and depression during medical visits.

b) **Preoperative corridor game interactive intervention**

Responsible nurses guided children to the corridor game area and selected appropriate games according to age groups:

- Children aged 3–6 years: Simple physical games including number hopscotch, cat hopscotch, frog long jump and rock-paper-scissors were prioritized. Attention was diverted via jumping and chasing to narrow the nurse-child distance and relieve initial anxiety. Colour recognition hopscotch and initial consonant hop games were matched to complete basic cognitive learning in games and distract fear of procedures.

- Children aged 7–12 years: Rule-based games such as good behavior flying chess, fire safety flying chess and drowning prevention flying chess were carried out. Health and safety knowledge was explained during fun competitions, guiding children to express inner worries and reconstruct positive cognition of fiberoptic bronchoscopy. Interactive popular science activities with 24 solar terms cognitive stickers were arranged to ease preoperative tension.

c) **Intraoperative tactile decompression game intervention**

Children were instructed to squeeze stress relief toys tightly for repeated squeezing and relaxing training. Nurses accompanied children throughout the procedure, encouraging them to focus on the tactile sensation of stress relief toys to interfere with pain signal transmission, relieve discomfort and tension during operation, reduce crying and restlessness, and ensure smooth fiberoptic bronchoscopy.

d) **Positive reinforcement incentive during postoperative and hospitalization**

Cartoon stickers, "Brave Kid Medals" (paper or electronic version) were issued according to children's cooperation before and during operation, together with oral praise and point rewards (accumulated points could be exchanged for small gifts). Immediate positive feedback was provided upon discharge to strengthen children's positive behavior of active cooperation and improve overall medical experience.

Observation Indicators

a) **Anxiety score:** Modified Yale Preoperative Anxiety Scale (m_YFAS) was adopted for evaluation 1 day before operation and 30 minutes before operation; higher scores represented severer anxiety.

b) **Anesthesia compliance**: Assessed by specialized bronchoscopy nurses, classified as full compliance, partial compliance, non-compliance and severe non-compliance. Total compliance rate = (number of full compliance cases + number of partial compliance cases) / total number of cases × 100%.

c) **Fluctuation of vital signs:** The heart rate before anesthesia induction and peak heart rate during operation were recorded to calculate the fluctuation range.

d) **Family satisfaction:** Self-designed questionnaire was adopted for assessment 24 hours after operation, wsssith a full score of 100; higher scores indicated higher satisfaction.

Statistical Methods

SPSS 26.0 statistical software was used for data analysis. Measurement data were expressed as mean ± standard deviation (\bar{x}±s) and compared by independent sample t-test. Enumeration data were expressed as rate (%) and compared by Chi-square test. P<0.05 was considered statistically significant.

Results

Comparison of Preoperative Anxiety Scores Between Two Groups

There was no statistically significant difference in m_YFAS scores between the two groups 1 day before operation (P>0.05). The scores of both groups decreased 30 minutes before operation, and the intervention group had lower scores than the control group, with statistically significant difference (P<0.05). See Table 1.

Table 1: Comparison of Preoperative Anxiety Scores Between Two Groups (\bar{x}±s, points).

Group	1 Day Before Operation	30 Minutes Before Operation
Intervention group (n=20)	12.7±3.0	6.4±1.9
Control group (n=20)	12.5±2.9	9.7±2.5
t value	0.215 4.326	4.326
P value	0.831	<0.001

Comparison of Anesthesia Compliance Between Two Groups

The total anesthesia induction compliance rate of the intervention group was 90.00% (18/20), higher than 65.00% (13/20) of the control group, with statistically significant difference (\chi^2=4.800, P=0.028).

Comparison of Intraoperative Vital Sign Fluctuation Between Two Groups

The heart rate fluctuation range of the intervention group was smaller than that of the control group, with statistically significant difference (P<0.05). See Table 2.

Table 2: Comparison of Intraoperative Vital Sign Fluctuation Between Two Groups (\bar{x}±s).

Group	Cases	Heart Rate Fluctuation (times/min)
Intervention group(n=20)		10.1±3.4
Control group (n=20)		16.7±4.1
t value		5.214
P value		<0.001

Comparison of Family Satisfaction Between Two Groups

The family satisfaction score of the intervention group was 93.1±3.7 points, higher than 84.4±5.1 points of the control group, with statistically significant difference (t=5.837, P<0.001).

Discussion

As an invasive procedure, fiberoptic bronchoscopy easily triggers severe preoperative anxiety and stress response in children, which directly affects anesthesia compliance and operational safety. Conventional verbal health education is abstract and tedious, hard for children to understand and accept. Centered on children, game intervention reduces fear of invasive procedures through visualized and interesting approaches.

The results of this study showed that the intervention group obtained significantly lower anxiety scores 30 minutes before operation, higher total anesthesia compliance rate and smaller intraoperative heart rate fluctuation, indicating that multi-form game intervention can effectively relieve children's preoperative anxiety, stabilize vital signs and improve compliance. Its mechanisms are as follows:

a) Child-friendly environment reduces environmental stress from spatial dimension, lowering children's psychological defense in a relaxing atmosphere;

b) Age-divided preoperative games divert attention through physical interactions and rule-based games, helping children build positive cognition of procedures;

c) Intraoperative tactile decompression with stress relief toys interferes with pain and discomfort signal transmission, reducing crying and restlessness;

d) Postoperative positive incentives strengthen positive behaviors of active cooperation and improve overall medical experience.

Meanwhile, the family satisfaction of the intervention group was significantly higher, demonstrating that game intervention embodies the humanistic nursing concept of pediatrics and strengthens family recognition of nursing work. This scheme makes full use of existing ward resources, featuring simple operation, low cost and high safety, which is suitable for promotion in preoperative nursing of pediatric invasive procedures including fiberoptic bronchoscopy [1-4].

Conclusion

Implementing multi-form and phased game intervention combining child-friendly environment renovation, preoperative corridor games, intraoperative decompression games and postoperative positive incentives for hospitalized children receiving fiberoptic bronchoscopy can markedly alleviate preoperative anxiety, improve compliance with anesthesia, stabilize intraoperative vital signs and elevate family satisfaction. It is a safe, effective and easily promotable perioperative psychological nursing protocol for pediatrics, worthy of further clinical application and optimization.

Acknowledgment

None.

Conflict of Interest

None.

References

1. Respiratory Group, Society of Pediatrics, Chinese Medical Association (2020) Clinical Application Guidelines for Pediatric Fiberoptic Bronchoscopy[J]. Chinese Journal of Pediatrics 58(2): 90-95.
2. Wang Li, Li Juan (2022) Research Progress of Non-pharmacological Interventions in the Management of Pediatric Preoperative Anxiety[J]. Chinese Journal of Nursing 57(8): 1012-1016.
3. Zhang Min, Liu Fang (2021) Application Value of Modified Yale Preoperative Anxiety Scale in Evaluating Pediatric Preoperative Anxiety[J]. Chinese Journal of Child Health Care 29(10): 1120-1123.
4. Li Xue, Zhang Yan (2021) Application Status and Prospect of Play Therapy in Pediatric Psychological Nursing [J]. Chinese Journal of Nursing Management 21(7):1089-1093.