

ORIGINAL RESEARCH

Impact of multimodal electronic follow-up systems on postoperative complications in pediatric dentistry under general anesthesia: a retrospective study

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Abstract

Background: In pediatric dentistry, effective postoperative management is essential for ensuring optimal treatment outcomes and minimizing complications. With the advent of advanced information technologies, electronic follow-up systems have emerged as a promising tool to enhance postoperative care. This study aims to explore the effectiveness of electronic follow-up systems in postoperative management, particularly their role in reducing complications and improving follow-up rates. **Methods:** This study retrospectively analyzed children who underwent dental treatment under general anesthesia at Shanghai Children's Hospital from September 2022 to February 2023. Patients were divided into an electronic follow-up system group and a routine medical advice group, with 60 cases randomly selected from each. Data on follow-up rates at 1, 3, 6 and 12 months postoperatively, complication rates at 6 and 12 months, and assessments of psychological status, oral health-related quality of life, and satisfaction with postoperative care at the 6-month mark were collected. Data analysis was performed using SPSS 28.0 software. **Results:** The results showed that the electronic follow-up system group had significantly higher follow-up rates at 1, 3, 6 and 12 months postoperatively compared to the routine medical advice group ($p < 0.001$). Additionally, the complication rate at both 6 and 12 months postoperatively was significantly lower in the electronic follow-up system group ($p < 0.05$). At the 6-month postoperative mark, this group had significantly lower anxiety and depression scores ($p < 0.001$), as well as higher quality of life scores and greater satisfaction with postoperative care ($p < 0.001$). **Conclusions:** The findings indicate that the implementation of electronic follow-up systems significantly enhances follow-up rates after pediatric dental treatment under general anesthesia, reduces the incidence of complications, improves children's psychological well-being and quality of life, and increases satisfaction with postoperative care. These results highlight the considerable clinical value of electronic follow-up systems in pediatric oral health management, and they are highly recommended as a follow-up method.

Keywords

Electronic follow-up system; Pediatric dental treatment under general anesthesia; Follow-up; Complications

1. Introduction

Dental anxiety is a common issue among children, with epidemiological studies indicating that approximately 50% to 80% of children experience varying degrees of dental phobia [1]. Recent research has reported a significant positive correlation between parental anxiety levels and those of their children [2, 3], suggesting that the psychological state of parents can directly affect a child's response to dental treatment. However, for children aged 4 to 6, anxiety levels do not significantly change with increasing age [4], complicating treatment and leading to delays or cancellations, ultimately affecting long-

term oral health.

In pediatric dentistry, dental general anesthesia (DGA) is commonly employed to address the needs of anxious or fearful children, as well as those with special requirements that complicate treatment, as it allows for the pain-free and efficient resolution of various oral issues in a single session, thereby alleviating parental distress and protecting the physical and mental health of the child [5]. However, the use of DGA is associated with specific risks and challenges. For instance, systemic diseases, including cardiovascular, pulmonary, renal, endocrine and metabolic disorders, can increase the risks associated with DGA or may even contraindicate its use in

certain cases [6]. Therefore, parents often express concerns about potential complications related to DGA, highlighting the need for a thorough understanding of the associated risks, benefits, and expected outcomes of DGA-regulated dental care. Furthermore, previous studies have reported significantly increased rates of postoperative restoration loss and adverse effects [7, 8], underscoring the importance of monitoring treatment outcomes at various stages and establishing the necessity of regular follow-ups at 1, 3, 6 and 12 months postoperatively [9]. Traditional postoperative management typically relies on parental memory and regular reminders from health-care providers, which presents limitations in facilitating timely communication regarding patients' conditions and follow-up appointments [10].

Advancements in modern medical technology, particularly the emergence of electronic follow-up systems, offer new possibilities for improving patient follow-up rates and treatment compliance. These systems enable more effective management of postoperative care through non-traditional patient-doctor interactions [11]. To our knowledge, there is a lack of large-sample clinical studies on the specific application effects of electronic follow-up systems in pediatric dental treatment under general anesthesia. This study aims to evaluate the effectiveness of electronic follow-up systems in the postoperative management of pediatric dental treatment under general anesthesia, specifically examining their potential role in reducing the incidence of complications and increasing follow-up rates from both domestic and international research to identify evidence-based management strategies to optimize oral health care for children.

2. Materials and methods

2.1 General information

This study included 120 pediatric patients who underwent ambulatory general anesthesia for dental treatment at the Department of Stomatology, Shanghai Children's Hospital, affiliated with Shanghai Jiao Tong University School of Medicine, between September 2022 and February 2023. All patients met the established inclusion criteria. During the visits, medical staff provided comprehensive information to parents regarding the electronic follow-up system and routine medical advice follow-ups after general anesthesia treatment, allowing parents to make informed choices regarding the follow-up method. The children were subsequently divided into two groups: an electronic follow-up system group and a routine medical advice group, with 60 cases randomly assigned to each group. The study inclusion criteria were as follows: ① The clinical diagnosis includes dental conditions such as caries, and the patient is unable to cooperate with local anesthesia outpatient treatment; ② all parents provided informed consent; ③ complete clinical data available; ④ classified as ASA I by the American Society of Anesthesiologists (ASA), indicating normal intelligence and absence of systemic diseases. The following cases were excluded from this study: Exclusion criteria: ① Refusal of follow-up surveys by parents; ② incorrect or unreachable phone numbers; ③ presence of severe mental or physical disorders, such as epilepsy, autism or cerebral

palsy. All surgeries were performed by the same medical team, consisting of senior physicians and anesthesiologists, and this study was approved by the hospital's ethics committee (2024R070-E01).

2.2 Methods

During the preoperative examination, the attending physician thoroughly explained the follow-up methods, related questionnaires, and the content of the informed consent form. Postoperatively, patients were allowed to autonomously choose their follow-up approach, which was divided into a routine medical advice group and an electronic follow-up system group. All medical staff involved in the electronic follow-up system underwent systematic training to ensure effective implementation of the system, and this training encompassed the operational procedures of the electronic follow-up system, patient data entry and management, and strategies for effective communication with patients. In addition, all staff received standardized training on the content of the questionnaires. Consequently, all questionnaires and informed consent forms were completed and signed voluntarily by the direct guardians of the participating children.

2.2.1 Routine medical advice group

Upon discharge after treatment, the medical staff provided education to both the children and their parents regarding essential oral hygiene practices, which included guidance on proper brushing techniques, the recommended duration and frequency of brushing, the importance of rinsing the mouth after meals, and strategies for maintaining a healthy diet. The staff emphasized the necessity for immediate hospital visits if any discomfort occurred and also reminded the parents about the importance of regular follow-up appointments scheduled at 1, 3, 6 and 12 months postoperatively. For children who did not return for their scheduled follow-ups, the medical staff conducted telephone surveys during working hours to investigate the reasons for missed appointments.

2.2.2 Electronic follow-up system group

Similar to the routine medical advice group, the medical staff educated the children and their guardians on oral hygiene practices upon discharge. Additionally, they introduced the electronic follow-up system (Chengdu MedCloud Technology Co., Ltd., China), which utilizes information technology and internet platforms to manage and track patients' health conditions. However, an English version of the application is currently not available. The guardians registered on the system by scanning a Quick Response code using the WeChat software on their mobile phones. After entering the child's age, gender, and other basic information, they gained access to the system following physician verification. This electronic follow-up system allows the creation of patient groups, enabling the staff to add notes on dental treatments, set reminders for follow-up appointments, and automatically send educational materials and questionnaires. The system also facilitates communication between doctors and patients by allowing the exchange of messages, voice notes, photos, videos and virtual phone calls as necessary. In cases where children did not return for their

scheduled follow-ups, the system provided real-time messaging or phone communication, facilitating the completion of questionnaire surveys online.

2.3 Observational indicators

The follow-up period for this study extends over one year. The primary observational indicator is the follow-up rate at six months postoperatively. Secondary indicators include follow-up rates at one, three and twelve months postoperatively, the reasons for missed appointments at six months, and the incidence of complications at both six and twelve months postoperatively. Moreover, anxiety scores, depression scores, and quality of life scores will be assessed at six months postoperatively. The Zung Self-Rating Anxiety Scale (SAS) and the Zung Self-Rating Depression Scale (SDS) [12] will be utilized, both of which are standardized on a 100-point scale, with higher scores indicating greater severity of anxiety or depression. Additionally, the hospital's self-developed scale for children's oral-related quality of life, based on the Oral Health-Related Quality of Life (OHRQoL) [13, 14], will be employed. This scale also has a total score of 100, where higher scores reflect better quality of life. Finally, parental satisfaction will be evaluated at six months postoperatively using a hospital-developed postoperative care satisfaction scale, which is informed by the Patient Satisfaction Questionnaire (PSQ-18) [15]. The total score for this scale is out of 100, with scores below 60 indicating dissatisfaction, scores between 60 and 80 indicating moderate satisfaction, and scores above 80 indicating high satisfaction.

2.4 Sample size calculation and analysis of potential bias

It was estimated that the postoperative follow-up rate at six months for the electronic follow-up system group was 85%, while for the routine medical advice group, it was 60%. Using a significance level of 0.05 and a power of 95%, the PASS 11 software (NCSS, Kaysville, UT, USA) revealed that a minimum of 49 patients was required for each group. Therefore, 60 patients were ultimately included in each group to ensure sufficient power for the study.

To minimize potential bias, this study used random sampling, addressing biases through the randomization process. Additionally, standardized assessment tools and clear instructions were utilized to reduce information bias. Importantly, there were no dropouts in the study; patients who did not follow up on time were contacted, and data were collected via telephone or the electronic follow-up system.

2.5 Statistical analysis

Data analysis was performed using the SPSS v28.0 software (IBM, Armonk, NY, USA). Categorical data were analyzed using the chi-square (χ^2) test and expressed as percentages (%). Quantitative data were assessed for normality using Quantile-Quantile plots and the Kolmogorov-Smirnov test. For postoperative intergroup comparisons, independent samples *t*-tests were employed, while paired samples *t*-tests were used for intragroup comparisons between pre- and post-operative mea-

surements. Group comparisons were conducted after adjusting for confounding factors and analyzed using multivariate linear regression. Statistical significance was established at $p < 0.05$.

3. Results

3.1 Comparison of age and gender between the two groups

The electronic follow-up system group consisted of 60 pediatric patients aged 3 to 7 years, with a mean age of 4.56 ± 1.23 years, comprising 24 females and 36 males. The routine medical advice group also included 60 pediatric patients aged 3 to 8 years, with a mean age of 4.85 ± 1.20 years, consisting of 26 females and 34 males. Data analysis revealed no significant differences in age or gender between the two groups ($p > 0.05$) (Table 1).

3.2 Comparison of postoperative follow-up between the two groups

Further analysis showed that the follow-up rates for children in the electronic follow-up system group at 1 and 3 months reached 100%, at 6 months it was 95%, and at 12 months it was 90%, all were significantly higher than those in the routine medical advice group at all follow-up intervals: 1, 3, 6 and 12 months postoperatively ($p < 0.001$) (Table 2).

3.3 Comparison of postoperative complication rates at 6 and 12 months

The postoperative complication rates for the group utilizing the electronic follow-up system were significantly lower than those for the routine medical advice group at both 6 and 12 months ($p < 0.05$). Additional detailed data are presented in Table 3.

3.4 Analysis of reasons for delayed follow-up postoperatively

In the electronic follow-up system group, the delayed follow-up for three cases was due to the absence of complications, which led to a lack of urgency to return for follow-up. In contrast, 38 patients from the routine medical advice group did not attend their follow-up appointments. Among these, the most common reason was forgetfulness about the follow-up schedule, accounting for 35% of cases. Other reported reasons included no oral discomfort in the child (11.7%), parental work commitments preventing visits (10%), and the distance from the hospital being too far (5%). A comprehensive overview of these reasons is presented in Table 4.

3.5 Comparison of psychological state and quality of life between the two groups

Before treatment, there were no significant differences in anxiety, depression, and quality of life scores between the two groups of children ($p > 0.05$). However, six months post-treatment, both groups showed significant reductions in anxiety and depression scores compared to preoperative levels ($p < 0.001$), along with improvements in quality of life scores

TABLE 1. Comparison of age and gender between the two groups.

Group	Number of cases	Age	Gender (Male/Female)
Electronic follow-up system group	60	4.56 ± 1.23	36/24
Routine medical advice group	60	4.85 ± 1.20	34/26
<i>p</i> -value		0.456	0.427

TABLE 2. Comparison of postoperative follow-up between the two groups (n (%)).

Group	Number of cases	1 month postoperative	3 months postoperative	6 months postoperative	12 months postoperative
Electronic follow-up system group	60	60 (100%)	60 (100%)	57 (95%)	54 (90%)
Routine medical advice group	60	34 (56.7%)	28 (46.7%)	22 (36.7%)	16 (26.7%)
<i>p</i> -value		<0.001	<0.001	<0.001	<0.001

TABLE 3. Comparison of postoperative complications between the two groups (n (%)).

Group	Number of cases	Time	Fillings falling off	Secondary caries	Swelling and pain
Electronic follow-up system group	60	6 months	2 (3.3%)	1 (1.7%)	1 (1.7%)
		12 months	3 (5.0%)	1 (1.7%)	1 (1.7%)
Routine medical advice group	60	6 months	5 (8.3%)	2 (3.3%)	2 (3.3%)
		12 months	5 (8.3%)	3 (5.0%)	4 (6.7%)
<i>p</i> inter-group comparison value			0.017	0.019	0.036

TABLE 4. Analysis of reasons for delayed follow-up between the two groups (n (%)).

Group	Number of cases	No oral discomfort	Parents too busy with work to visit	Forgot follow-up time	Distance from hospital too far
Electronic follow-up system group	60	3 (5.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Routine medical advice group	60	7 (11.7%)	6 (10.0%)	21 (35.0%)	3 (5.0%)

($p < 0.001$). Specifically, the electronic follow-up system group's children had lower anxiety scores (45.62 ± 3.41) and depression scores (42.51 ± 2.84) than the routine medical advice group, which had anxiety scores (50.12 ± 4.06) and depression scores (47.62 ± 5.16). The quality of life score (82.36 ± 9.23) of the electronic follow-up system group was higher than that of the routine medical advice group (65.23 ± 9.43), with statistically significant differences ($p < 0.001$). A detailed analysis of these findings is presented in Table 5 and illustrated in Fig. 1. The results of the multivariate regression analysis indicated that age and gender did not significantly influence the intergroup scoring comparisons ($p > 0.05$).

When performing pediatric dental treatment under general anesthesia, the Zung SAS and the Zung SDS were utilized to assess anxiety and depression levels in children and their parents to understand their psychological state before and after treatment. This allowed monitoring of any improvements in the child's psychological health status, thereby evaluating the effectiveness of the treatment. The OHRQoL scale was also employed to quantitatively evaluate the patients' oral health status, including aspects such as pain, functional limitations and psychological impacts, assessing changes in quality of life before and after treatment to determine the treatment's effectiveness and the degree of improvement.

3.6 Comparison of parent satisfaction with follow-up reminders between the two groups

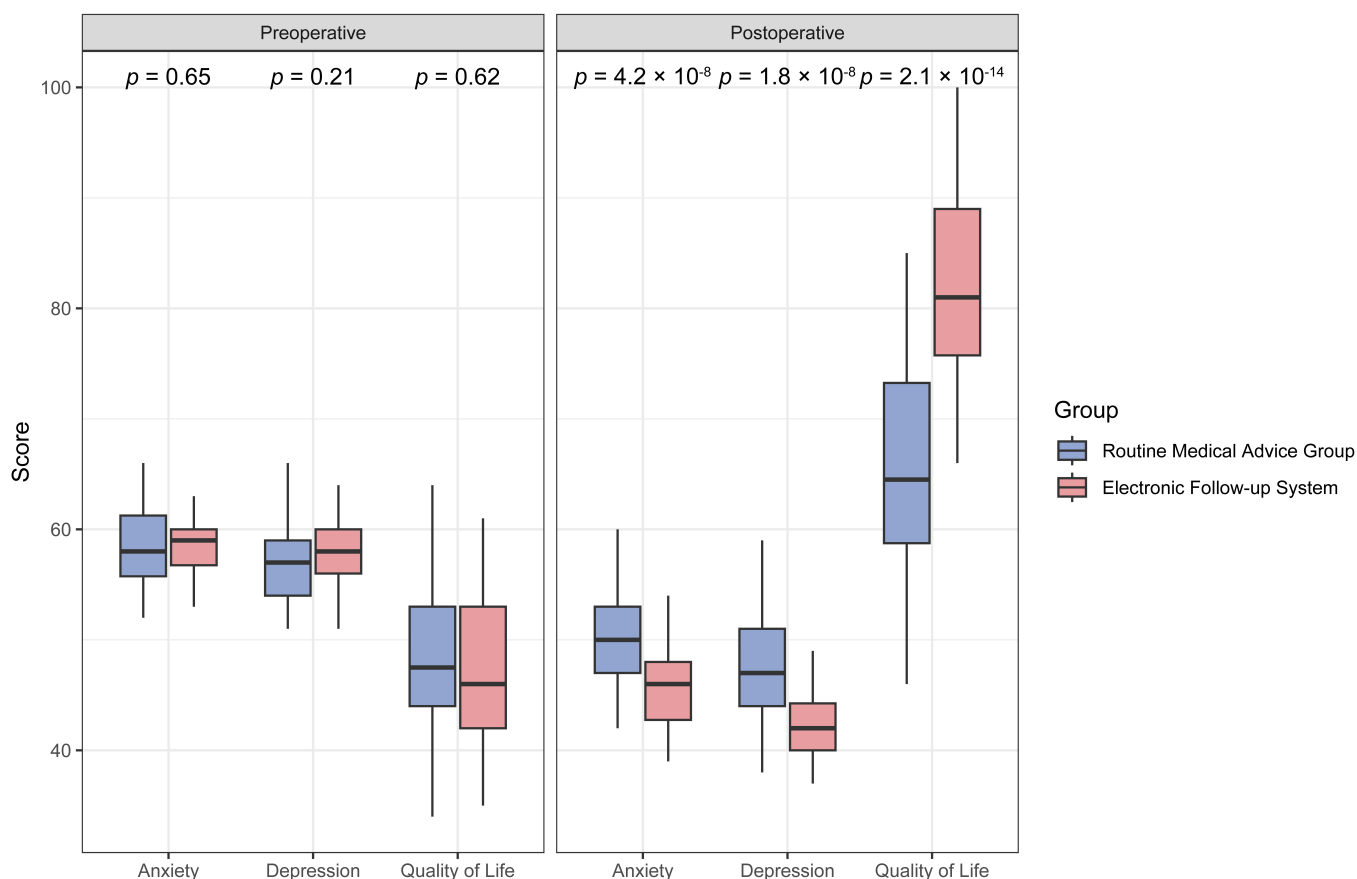
Parental satisfaction in the electronic follow-up system group was significantly high, with a satisfaction rate of 96.7% (58 out of 60 respondents). This rate significantly exceeded the satisfaction level in the routine medical advice group, which was 73.3% (44 out of 60 respondents) ($\chi^2 = 4.706$, $p = 0.03$). Further details on the survey outcomes are shown in Table 6.

4. Discussion

The modern medical model and advancements in medical technology are continuously evolving, and ambulatory surgery with general anesthesia for pediatric dental treatment has emerged as a primary method in pediatric dentistry [16]. Due to its high safety profile and painless nature, general anesthesia is increasingly utilized for treating uncooperative children and has gained recognition and acceptance among parents [17, 18]. While general anesthesia can effectively address existing oral issues in a single session, postoperative oral hygiene maintenance and regular follow-ups remain essential; without them, the recurrence rate of postoperative caries can be high [19]. Regular postoperative care is as critical

TABLE 5. Comparison of mental status and quality of life between the two groups.

Group	Number of cases	Time	Anxiety score	Depression score	Quality of life score
Follow-up system group	60	Preoperative	58.25 ± 2.45	57.74 ± 3.25	47.25 ± 7.26
		6 months postoperative	45.62 ± 3.41	42.51 ± 2.84	82.36 ± 9.23
Routine medical advice group	60	Preoperative	58.63 ± 3.62	57.02 ± 3.59	47.74 ± 7.36
		6 months postoperative	50.12 ± 4.06	47.62 ± 5.16	65.23 ± 9.43
Postoperative 6-month (linear regression) age <i>p</i> -value			0.386	0.570	0.262
Postoperative 6-month (linear regression) gender <i>p</i> -value			0.096	0.889	0.073
<i>t/p</i> Electronic follow-up system group (Pre and Post)			21.269/<0.001	24.952/<0.001	21.141/<0.001
<i>t/p</i> Routine medical advice group (Pre and Post)			11.063/<0.001	10.574/<0.001	10.339/<0.001
<i>t/p</i> Inter-group comparison value (Preoperative)			0.615/0.540	1.051/0.296	0.335/0.738
<i>t/p</i> Inter-group comparison value (Postoperative)			6.001/<0.001	6.135/<0.001	9.180/<0.001

**FIGURE 1. Comparison of mental status and quality of life between the two groups.****TABLE 6. Comparison of parent satisfaction between the two groups (n (%)).**

Group	Number of cases	Very satisfied	Relatively satisfied	Dissatisfied	Satisfaction rate
Electronic follow-up system group	60	46 (76.7)	12 (20.0)	2 (3.3)	58 (96.7)
Routine medical advice group	60	32 (53.3)	12 (20.0)	16 (26.7)	44 (73.3)
χ^2 value					4.706
<i>p</i> value					0.030

as the initial treatment itself [20]. Clinically, follow-up visits after general anesthesia for pediatric dental procedures are essential, as they facilitate the monitoring and prevention of complications such as secondary caries and restoration loss [21–24]. Through regular follow-ups, healthcare providers can promptly assess the oral condition of children, identify and address issues early, and prevent further disease progression, thereby maintaining long-term health.

In this study, we established follow-up intervals based on scientifically recognized time points, such as 1 month, 3 months, 6 months and 12 months postoperatively [9]. The first follow-up typically occurs one month after filling, allowing dentists to evaluate the success of the procedure. The three-month follow-up focuses on monitoring the status of the filling and checking for new cavities, as well as assessing the child's oral hygiene practices to ensure effective maintenance of oral health. At the six-month follow-up, attention is directed toward the integrity of the filling and overall dental health, with potential in-depth examinations such as X-rays to identify periapical diseases or other issues. The twelve-month follow-up serves as a long-term assessment of the effectiveness of previous treatments. Despite the importance of these follow-ups, current research [21] and clinical observations indicate a high rate of missed appointments after dental general anesthesia. Therefore, healthcare professionals need to improve their follow-up investigations and establish robust postoperative follow-up mechanisms [21]. In this context, the electronic follow-up system has emerged as a significant component of the medical service framework [25]. This system not only streamlines communication and improves follow-up rates but also enhances the overall quality of patient care.

This study aimed to reduce the time spent on questionnaires for children and parents during follow-up visits, minimize repetitive questioning, and obtain long-term follow-up results, particularly focusing on the 6-month postoperative indicators. The findings revealed that the electronic follow-up system group exhibited significantly higher follow-up rates at 1, 3, 6 and 12 months postoperatively compared to the routine medical advice group ($p < 0.001$). Additionally, the incidence of complications at 6 months postoperatively was significantly lower in the electronic follow-up system group ($p < 0.05$). These results indicate that the electronic follow-up system provides a convenient communication platform for parents of pediatric patients, enabling parents to interact with healthcare providers through text, voice, images, videos and even telephone calls to receive personalized medical guidance. Such immediate communication and feedback mechanisms may enhance parents' understanding and satisfaction with the treatment process, thereby increasing their likelihood of adhering to medical advice. Moreover, the electronic follow-up system mitigates the risk of parents forgetting follow-up appointments by sending timely reminders and automatically distributing educational materials. A study examining the reasons for missed follow-ups and associated nursing strategies after pediatric dental treatment under general anesthesia highlighted that forgetfulness is a primary reason for missed appointments [26]. This finding was reflected in our study, where 38 out of 60 parents in the routine medical advice

group failed to attend their 6-month follow-up, with 35% citing forgetfulness. In contrast, only three parents in the electronic follow-up system group did not return on time, and their reason was the absence of oral discomfort in the child. However, it is essential to note that if children do not experience discomfort, especially after communication through the platform, some parents may perceive that a follow-up visit is unnecessary, highlighting the need for enhanced digital education regarding the importance of follow-up visits [27]. Thus, the reminder function of the electronic follow-up system addresses this gap by facilitating continued communication between healthcare providers and patients after the initial diagnosis, improving medical compliance, and fostering a harmonious doctor-patient relationship, ultimately enhancing the quality and continuity of medical services [11]. In the conventional medical advice group, approximately 15% of parents cited work commitments, geographic distance from the hospital, and inconvenient transportation as barriers to timely follow-up appointments. The electronic follow-up system presents a notable advantage in this context, affording parents the flexibility to schedule and reschedule follow-up times according to their personal commitments. Conversely, parents in the conventional group are dependent on memory and manual record-keeping, which are prone to being neglected amidst daily routines and may complicate the rearrangement of work schedules, thereby hindering punctual adherence to follow-up appointment slots.

A study examining the effectiveness of WeChat for follow-up after pediatric dental treatment under general anesthesia [10] found that utilizing modern communication tools significantly increased follow-up rates and reduced the incidence of complications. However, WeChat does not have the function to set timely follow-up reminders as this may compromise personal privacy. In this study, the electronic follow-up system group demonstrated lower anxiety scores (45.62 ± 3.41) and depression scores (42.51 ± 2.84) at 6 months postoperatively compared to the routine medical advice group (50.12 ± 4.06 and 47.62 ± 5.16 , respectively) ($p < 0.001$). Additionally, the quality of life score for the electronic follow-up system group (82.36 ± 9.23) was significantly higher than that of the routine medical advice group (65.23 ± 9.43). These findings may be attributed to the timely communication and psychological support offered by the electronic follow-up system. In recent years, an increasing number of patients and their families have found it inconvenient to answer phone calls during working hours or may refuse calls from unknown numbers. The patient-centered approach of the electronic follow-up system allows for follow-ups that do not disrupt patients, enabling them to communicate at their convenience and effectively extending medical services. Furthermore, a study on the application of general anesthesia in treating pediatric oral diseases [28] emphasized the importance of timely postoperative care and psychological support for enhancing the mental health and quality of life of children. Pediatric dental treatment under general anesthesia can improve children's chewing function, reduce the frequency of visits, alleviate anxiety, and enhance overall quality of life [29–31]. This study supports those findings, showing that parental satisfaction in the electronic follow-up system group was significantly higher than in the

routine medical advice group. The ability for parents to communicate with the attending physician through the software at any time further reduces anxiety and depression, allows for flexible follow-up scheduling, and ultimately improves satisfaction with medical treatment.

The strength of this study lies in its large sample size and randomized group design, which enhance the reliability of the results. While the study provides robust evidence for the benefits of the electronic follow-up system, several limitations should be acknowledged. The sample is restricted to patients from Shanghai Children's Hospital, which may not fully represent the pediatric population in other regions or countries. Although our follow-up period was 1 year, some long-term effects may require observation over a longer timeframe. During the study period, no additional medical interventions or instances of loss to follow-up were documented. While this could suggest a coherent treatment and follow-up process, it may also constrain our comprehension of the intricacies associated with post-treatment scenarios. In our analysis, we utilized multivariate regression analysis regression to control for potential confounding factors, including the age and gender of the children. To further improve the precision of our analysis, we plan to collect additional relevant variables in future studies, such as family socioeconomic status and parental educational levels, as these factors may influence children's follow-up behavior and treatment outcomes. Currently, there are no cases involving multiple dental treatments under general anesthesia, limiting our ability to assess the long-term effects of repeated anesthesia on children [32]. Additionally, we have not evaluated the impact of waiting times on the satisfaction of parents or caregivers [33–35], which is an important consideration; prolonged waiting times can lead to dissatisfaction and decreased adherence to treatment. Therefore, Future studies should aim to broaden the demographic scope of their samples to encompass pediatric patients from a variety of regions and countries. Prolonging the duration of follow-up will facilitate a more robust evaluation of the long-term efficacy of treatments. Additionally, the collection and analysis of data on a wider array of relevant variables will enable a more comprehensive understanding of the factors that influence follow-up compliance and treatment outcomes, ultimately enhancing the academic contributions of such research.

5. Conclusions

In conclusion, the electronic follow-up system can significantly enhance dental follow-up rates, which could reduce the incidence of postoperative complications, improve psychological well-being and elevate the quality of life for pediatric patients. Therefore, the adoption of such systems in the context of dental procedures for children who underwent general anesthesia could be recommended. Future studies should extend their investigation into the efficacy of electronic follow-up systems across diverse geographical regions and cultural settings. Additionally, there is a need to explore the potential integration of advanced information technologies, including artificial intelligence and big data analytics, to augment the capabilities and user experience of such systems. This research direction could lead to significant advancements in the field of

patient follow-up care.

AVAILABILITY OF DATA AND MATERIALS

The findings of this study are accessible upon request to the lead contact author.

AUTHOR CONTRIBUTIONS

JLG—was in charge of the study's conception, data assembly and evaluation, and original draft preparation. JHG—aided in the assembly and evaluation of the data, as well as in performing the data analysis. GJY—was in charge of the secondary review of the experiments and the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Ethics Committee of Shanghai Children's Hospital granted approval for this study (Reference No. 2024R070-E01). Participants or their legal guardians were informed about the questionnaires and provided consent at the outset, with the understanding that they could opt to withdraw from the study at any time.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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