Preoperative Anxiety Management Practices in Pediatric Anesthesia: A Comparative Analysis of an Online Survey presented to Experts and Social Media Users

Armin Sablewski, Christine Eimer, Marcus Nemeth, Clemens Miller

Submitted to: Journal of Medical Internet Research
on: July 23, 2024

Table of Contents

Preoperative Anxiety Management Practices in Pediatric Anesthesia: A Comparative Analysis of an Online Survey presented to Experts and Social Media Users

Armin Sablewski[1] MD; Christine Eimer[1] MD; Marcus Nemeth[2] MD; Clemens Miller[2, 3] MD

[1]Department of Anesthesiology and Intensive Care Medicine University Medical Center Schleswig-Holstein, Campus Kiel Kiel DE
[2]Department of Anesthesiology University Medical Center Goettingen Goettingen DE
[3]Department of Anesthesiology Children's Orthopedic Hospital Aschau im Chiemgau Aschau im Chiemgau DE

Corresponding Author:
Armin Sablewski MD
Department of Anesthesiology and Intensive Care Medicine
University Medical Center Schleswig-Holstein, Campus Kiel
Arnold-Heller-Straße 3
Haus R3
Kiel
DE

Abstract

Background: Managing preoperative anxiety in pediatric anesthesia is challenging, as it impacts patient cooperation and postoperative outcomes. Both pharmacological interventions and non-pharmacological interventions are used to reduce children's anxiety levels. However, the optimal approach remains debated, with evidence-based guidelines still lacking. As a consequence, many different approaches exist.

Objective: To increase understanding of the current anxiety management practices, we conducted a public survey via social media platforms, aiming to compare anesthesia providers from an "expert" group and a "social media" group in terms of pediatric anesthesia expertise and to identify differences in preoperative anxiety management between the two groups.

Methods: Two surveys were conducted: The first survey targeted attendees of the Scientific Working Group on Pediatric Anesthesia in June 2023 forming the 'Expert Group' (EG), and the second survey targeted followers of a pediatric anesthesia platform on social media forming the 'Social Media Group' (SG). Both surveys with 24 items were conducted using the same online platform. Questions were grouped into five categories: Pediatric Anesthesia Expertise, Representativity, Structural Conditions, Practices of Pharmacological Management and Practices in Non-Pharmacological Management. The primary objective was to assess the pediatric anesthesia expertise of the SG compared to the EG. Secondary objectives were the differences in the clustered categories with regards to preoperative anxiety management.

Results: The study included 198 respondents, with 194 analyzed after excluding 4 due to prior participation or missing data (82 in EG and 112 in SG). The EG cohort exhibited significantly greater professional experience in pediatric anesthesia than the SG cohort (median 19 vs. 10 years, $p<0.001$), higher specialist status (97.6% vs. 64.6%, $p<0.001$), and a greater pediatric anesthesia volume (43.9% vs. 12.0% with more than 500 cases per year, $p<0.001$). Regarding the representativity, two items out of four were statistically significant (level of care of institution, annual case load of institution). Regarding the overall anxiety management practices used, there is a heterogeneous response pattern within both groups, with only five out of 17 items showing statistical significance (feasibility of parental presence during induction, known anxiety measurement tools, induction-based prescription of drugs, minimum age and use of non-pharmacological interventions).

Conclusions: Although the respondents do not reflect the level of expertise as a survey of a scientific working group, social media surveys on pediatric anesthesia may be feasible to get an overview of a specific topic when there is great heterogeneity overall. In our case, both cohorts showed little difference in the management of preoperative anxiety in daily practice with very heterogeneous approaches. Evidence-based recommendations could help to standardize preoperative anxiety management and improve anxiety levels in children. Clinical Trial: not necessary

(JMIR Preprints 23/07/2024:64561)

DOI: https://doi.org/10.2196/preprints.64561

Preprint Settings

1) Would you like to publish your submitted manuscript as preprint?

✓ **Please make my preprint PDF available to anyone at any time (recommended).**
Please make my preprint PDF available only to logged-in users; I understand that my title and abstract will remain visible to all users.
Only make the preprint title and abstract visible.
No, I do not wish to publish my submitted manuscript as a preprint.

2) If accepted for publication in a JMIR journal, would you like the PDF to be visible to the public?

✓ **Yes, please make my accepted manuscript PDF available to anyone at any time (Recommended).**
Yes, but please make my accepted manuscript PDF available only to logged-in users; I understand that the title and abstract will remain v
Yes, but only make the title and abstract visible (see Important note, above). I understand that if I later pay to participate in <a href="http

Original Manuscript

Preoperative Anxiety Management Practices in Pediatric Anesthesia: A Comparative Analysis of an Online Survey presented to Experts and Social Media Users

Original Paper

Armin Sablewski, MD
Department of Anesthesiology and Intensive Care Medicine, University Medical Center Schleswig-Holstein, Campus Kiel, Kiel, Germany
0009-0005-3132-589X
Armin.sablewski@uksh.de

Christine Eimer, MD
Department of Anesthesiology and Intensive Care Medicine, University Medical Center Schleswig-Holstein, Campus Kiel, Kiel, Germany
0000-0001-8108-8742
Christine.eimer@uksh.de

Marcus Nemeth, MD
Department of Anesthesiology, University Medical Center Goettingen, Goettingen, Germany
0000-0001-6288-7784
marcus.nemeth@med.uni-goettingen.de

Clemens Miller, MD
Department of Anesthesiology, Children's Orthopedic Hospital Aschau im Chiemgau, Aschau im Chiemgau, Germany.
Department of Anesthesiology, University Medical Center Goettingen, Goettingen, Germany

0000-0002-4302-9167
clemens.miller@med.uni-goettingen.de

Correspondence:

Dr. med. Armin Sablewski DESAIC
Department of Anesthesiology and Intensive Care Medicine
University Medical Center Schleswig-Holstein, Campus Kiel
Arnold-Heller-Straße 3, Haus R3
24105 Kiel, Germany
E-Mail: armin.sablewski@uksh.de

Abstract

Background

Managing preoperative anxiety in pediatric anesthesia is challenging, as it impacts patient cooperation and postoperative outcomes. Both pharmacological interventions and non-pharmacological interventions are used to reduce children's anxiety levels. However, the optimal approach remains debated, with evidence-based guidelines still lacking. As a consequence, many different approaches exist.

Objective

To increase understanding of the current anxiety management practices, we conducted a public survey via social media platforms, aiming to compare anesthesia providers from an "expert" group and a "social media" group in terms of pediatric anesthesia expertise and to identify differences in preoperative anxiety management between the two groups.

Methods

Two surveys were conducted: The first survey targeted attendees of the Scientific Working Group on Pediatric Anesthesia in June 2023 forming the 'Expert Group' (EG), and the second survey targeted followers of a pediatric anesthesia platform on social media forming the 'Social Media Group' (SG). Both surveys with 24 items were conducted using the same online platform. Questions were grouped into five categories: Pediatric Anesthesia Expertise, Representativity, Structural Conditions, Practices of Pharmacological Management and Practices in Non-Pharmacological Management. The primary objective was to assess the pediatric anesthesia expertise of the SG compared to the EG. Secondary objectives were the differences in the clustered categories with regards to preoperative anxiety management.

Results

The study included 198 respondents, with 194 analyzed after excluding 4 due to prior participation or missing data (82 in EG and 112 in SG). The EG cohort exhibited significantly greater professional experience in pediatric anesthesia than the SG cohort

(median 19 vs. 10 years, *P*<.001), higher specialist status (97.6% vs. 64.6%, *P*<.001), and a greater pediatric anesthesia volume (43.9% vs. 12.0% with more than 500 cases per year, *P*<.001). Regarding the representativity, two items out of four were statistically significant (level of care of institution, annual case load of institution). Regarding the overall anxiety management practices used, there is a heterogeneous response pattern within both groups, with only five out of 17 items showing statistical significance (feasibility of parental presence during induction, known anxiety measurement tools, induction-based prescription of drugs, minimum age and use of non-pharmacological interventions).

Conclusion

Although the respondents do not reflect the level of expertise as a survey of a scientific working group, social media surveys on pediatric anesthesia may be feasible to get an overview of a specific topic when there is great heterogeneity overall. In our case, both cohorts showed little difference in the management of preoperative anxiety in daily practice with very heterogeneous approaches. Evidence-based recommendations could help to standardize preoperative anxiety management and improve anxiety levels in children.

Abstract Word Count: 427/450

Keywords

Pediatric anesthesia; Online Survey; Preoperative Anxiety management in children; Pharmacological Interventions; Non-Pharmacological Interventions; Social Media Survey

Introduction

Although "no fear" is the first of the "10-N quality criteria" in pediatric anesthesia, preoperative anxiety remains prevalent [1,2]. However, it is evident that high levels of anxiety are associated with decreased cooperativeness during induction of anesthesia, increased postoperative analgesic requirements, increased rates of postoperative delirium, and maladaptive behavioral problems [3,4]. Therefore, it is crucial to keep anxiety levels low.

Established options for preoperative anxiolysis in children include pharmacological interventions and non-pharmacological interventions. Midazolam, clonidine and dexmedetomidine as well as (s-)ketamine are frequently used for pharmacological premedication [5,6]. However, the general use of these drugs is subject to controversial debate [6,7]. Non-pharmacological interventions include parental presence at induction of anesthesia, educational approaches (e.g., informational mediation, prior inspection of the operating room), complementary medical procedures (such as acupuncture, music therapy, hypnosis) and cognitive-behavioral therapeutic measures (such as strengthening coping strategies, distraction, breathing exercises, model learning) [8–14]. Non-pharmacological interventions have been shown to be at least as effective as the administration of midazolam [15]. Although many different options are available, there are currently no evidence-based recommendations and guidelines on which intervention is best for which situation. Recently, we conducted a survey on the current practice of preoperative anxiety management in pediatric anesthesia among German-speaking participants [16]. It was conducted during an expert meeting of the Scientific Working Group for Pediatric Anesthesia of the German Society of Anesthesiology and Intensive Care Medicine and revealed relevant differences in the structural conditions, management of pharmacologic premedication, and the use of non-pharmacologic measures [16].

However, we assumed that the participants in expert meetings do not necessarily reflect the diversity of users, and therefore the overall picture of daily anxiety management could be biased. Web-based surveys could help to overcome this limitation, allowing for larger sample sizes and the inclusion of participants across geographic boundaries. They have also become increasingly popular due to their time efficiency and low cost [17].

To get a broader overview of the general practice of preoperative anxiety management including all professional groups and levels of experience working in pediatric anesthesia, we announced a public survey with the same questions as during the expert meeting via X, Instagram and the website of a German-language podcast on pediatric anesthesia and invited followers to participate. Hypothesizing that ‘expert group’ and ‘social media group’ would differ in pediatric anesthesia expertise, we aimed to identify similarities and differences in the management of preoperative anxiety of both groups.

Methods

This analysis did not require approval by an Institutional Review Board or entry into a clinical trial register since it did not include data from patients or medical records. The processed data consisted of two surveys, each conducted independently with voluntary and anonymous participation. There were no follow-up validation attempts to verify if the respondents were truly qualified. We adhered to all items of the “Good practice in the conduct and reporting of survey research” checklist [18].

Data sources

The first survey was conducted among participants of the annual meeting of the Scientific Working Group on Pediatric Anesthesia of the German Society for Anesthesiology and Intensive Care medicine (DGAI), which took place in Hamburg, Germany, on June 16-17, 2023. During the event, access to an online survey, using Microsoft Forms (Office 365, Redmond, USA), was given via a QR code. The survey contained 25 questions targeting daily practice of preoperative anxiety management in children (Multimedia Appendix 1). Those respondents formed the ‘Expert Group’ (EG), serving as reference to the second survey. Results of this survey were formerly published [16].

The second survey was announced among followers of a German-language podcast on pediatric anesthesia [19]. This podcast is broadcast on the platforms such as Spotify, Apple Podcast etc. (in total 44 platforms) and has achieved approximately 130k downloads and streams with its 34 episodes (data retrieved on 01 July 2024). Users were given access to this survey from October 01-31 in 2023. The first call for participation was made on October 01, 2023 via short posts on the social media platforms X, Bluesky and Instagram, as well as posts on the corresponding social media accounts. Additionally, several reposts were made and a short podcast episode on October 19, 2023 was broadcast to re-call for participation (1117 downloads in survey period). In comparison to the first survey, this one was expanded to cover the broad spectrum of social media users with four more questions (marked with asterisk (*) in Multimedia Appendix 1). Respondents formed the ‘Social Media Group' (SG).

For both surveys, multiple participation could not be technically excluded but respondents of the second survey were asked to refuse participation in case of prior participation to the first survey. Multiple selections were possible for some questions.

Data processing

Both survey data were checked for incomplete data and then matched using Microsoft Excel (Office 2019, Microsoft, Redmond, USA). The questions were clustered into 5 categories: i) pediatric anesthesia expertise (3 items), ii) representativity (5 items for both surveys and 4 additional items in SG), iii) structural conditions (9 items), iv) practices of pharmacological routine (6 items) and v) practices of non-pharmacological routine (2 items). The item ‘zip codes’ and the four additional questions were excluded from the comparison between the two groups, resulting in a total of 24 items being compared.

Objectives

The primary objective was to assess the pediatric anesthesia expertise of the SG compared to the EG, given by significant differences in professional expertise (defined by years of professional experience), expert-status (defined as being board-certified anesthesiologist with passed professional examination) and number of personal annual pediatric anesthesia case volume. The secondary objectives were the differences in the clustered categories of general characteristics and of practices in managing preoperative anxiety, capturing structural conditions and practices in both pharmacological and non-pharmacological interventions.

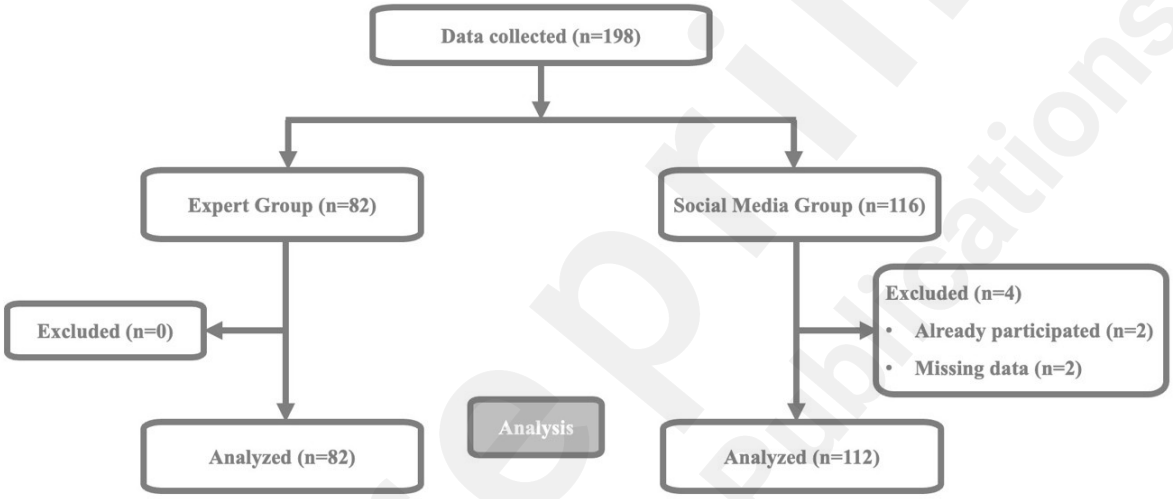
Statistical analysis

In the descriptive analysis, we presented the absolute and relative frequencies for the respective groups for categorical variables and the medians, interquartile ranges and total ranges for the respective groups for continuous variables. We applied a significance level of 0.05 for all statistical tests. The Kolmogorov-Smirnov test was used to assess the normality of the distribution. P-values for the comparison of both groups were calculated using Fisher’s exact test or Chi-square test for categorical variables, and the Wilcoxon rank sum test for continuous variables. Analysis and illustrations were performed with GraphPad Prism (GraphPad Software, LaJolla California, USA) and Microsoft Excel (Office 2019, Microsoft, Redmond, USA).

Results

198 respondents participated in both surveys, 82 in the Experts Group (“EG”) and 116 in the Social Media Group (“SG”), respectively. Two responses from the SG were excluded due to prior participation in the EG survey, and another two were excluded due to missing data, leaving 194 responses for the final analysis in both groups (see Figure 1 for the flow chart).

Figure 1. Data report.



In the five clustered categories, we found 10 out of 24 items to be significantly different in the response behavior between the two groups (see Table 1, corresponding questions in Multimedia Appendix 1).

Table 1. Survey items in clustered categories with differences between the Expert Group and the Social Media Group. Detailed evaluation in the text.

Category	Item	***P* value**
Pediatric anesthesia expertise	Years of professional experience	.001
	Specialist (board-certified anesthesiologist)	.001
	Personal pediatric anesthesia case volume annually	.001
Representativity	Gender	.512
	Country of respondents' institution	.649
	Level of care of the institution	.001
	Institutional pediatric anesthesia case volume annually	.001
Structural conditions	Written protocols for managing preoerative anxiety	.463
	Existing preoperative preparation programs	.757
	Used preoperative preparation programs	.900
	Feasibility (local conditions) of parental presence during induction of anesthesia	.013
	Standard of parental presence during induction of anesthesia	.689
	Place of separation of the children from their caregivers	.836
	Routine in anxiety measurement	.164
	Used anxiety measurement tools	NA[a]
	Known anxiety measurement tools	0.001
Practices of pharmacological management	Regular use of preoperative medication	.999
	Indication-based prescription of premedication, avoiding routine use	.039

	Criteria for deciding on premedication use	.238
	Most commonly used substance	.232
	1st choice for premedication	>.999
	Minimum age for administering premedication	<.001
Practices of non-pharmacological management	Standard practice of non-pharmacological interventions	.633
	Use of non-pharmacological interventions	<.001

[a] NA, not applicable: Only four responses in the EG and only one in the SG, no statistical analysis was carried out.

Pediatric anesthesia expertise

The level of pediatric anesthesia expertise demonstrated by the SG was significantly lower than that reported in the EG. This was given by a lower number of professional experience in the SG with a median of 10 years (interquartile range 6-18; total range 1-45) compared to a median of 19 years (14-25; 5-35) in the EG (*P*<.001), a lower share of respondents being specialists (64.6% versus 97.6%, *P*<.001), and a lower number of respondents performing more than 500 pediatric anesthesia cases per year (12.0% versus 43.9%, *P*<0.001, details in Table 2).

Table 2. Distribution of performed anesthesia case volume per year

Personal pediatric anesthesia case volume annually	**EG (N=82) n (%)**	**SG (N=112) n (%)**
0-49	4 (4.9)	50 (46.3)
50-99	1 (1.2)	17 (15.7)
100-199	13 (15.9)	15 (13.9)
200-299	11 (13.4)	7 (6.5)
300-399	11 (13.4)	5 (4.6)
400-499	6 (7.3)	1 (0.9)
>500	36 (43.9)	13 (12)
Not answered	0	4

Representativity

Both groups showed a similar gender distribution (56.6% female in EG versus 50.0% in SG, *P*=.512) and the same percentage of respondents from Germany (93.8% each). In the EG, respondents originated from three more countries (Switzerland, Austria, Italy), whereas in the SG, respondents came from five more countries (Switzerland, Austria, Serbia, UK, Hungary).

Differences in the level of care across respondents' workplaces were statistically significant (*P*<.001, Table 3). Most respondents came from university hospitals (34.6% in EG vs. 29.5% in SG) while more respondents came from standard care hospitals in the SG (24.1%) than in the EG (7.4%).

Table 3. Level of care across respondents' workplaces with numbers and share.

	EG (N=82) n (%)	**SG (N=112) n (%)**
Level of care of the institution		
Ambulatory	6 (7.4)	10 (8.9)
Standard Care Hospital	6 (7.4)	27 (24.1)
Children's Hospital	18 (22.2)	11 (9.8)
High Care Hospital	17 (21)	27 (24.1)
University Hospital	28 (34.6)	33 (29.5)
Others	6 (7.4)	4 (3.6)
Not answered	1	0
Number of pediatric anesthesia cases at the institution per year		
0-249	2 (2.5)	26 (25)
250-499	10 (12.5)	19 (18.3)
500-999	11 (13.8)	23 (22.1)
>1000	57 (71.3)	36 (34.6)
Not answered	2	8

Structural conditions

In EG, 36 respondents (43.9%) reported to have a written standard operating procedure for managing preoperative anxiety, compared to 43 respondents (38.4%) in SG (*P*=.463). A preoperative preparation for children and their caregivers was included as part of anesthesia information by 28 respondents (34.1%) in EG and by 35 respondents (31.3%) in SG (*P*=.757). Among those who reported using specific material, there was no difference in

the choice of measures (*P*=.900). The most frequently used materials were "pediatric-specific informed consent", information flyers and comics (see Table 4).

Table 4. Materials used to help prepare children and their caregivers preoperatively.

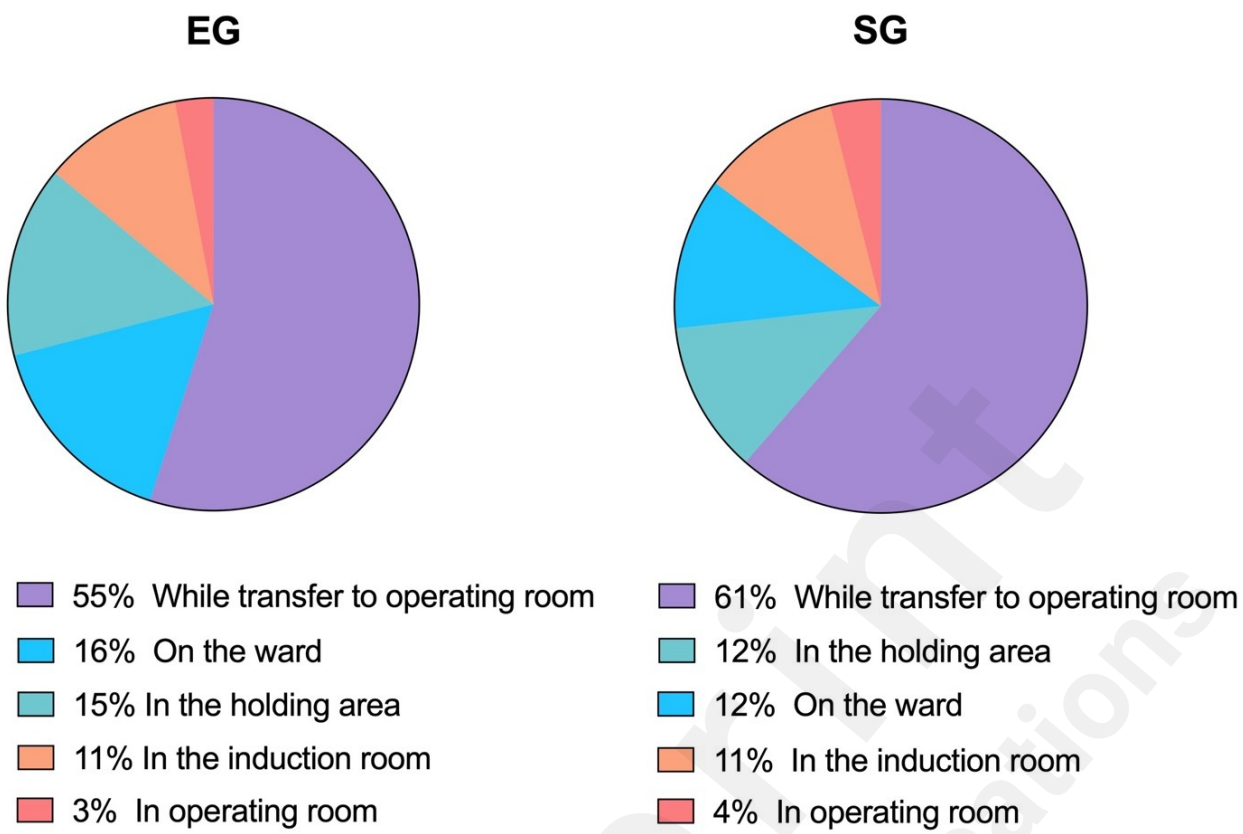
	EG (N=28) n (%)	SG (N=35) n (%)
Pediatric-specific informed consent	19 (25.5)	23 (20.5)
Information flyer	16 (21.5)	15 (13.4)
Comics	8 (10.7)	10 (8.9)
A designed mascot	7 (9.4)	8 (7.1)
Videos	4 (5.4)	2 (1.8)
Other[a]	2 (2.7)	3 (2.7)
Hypnosis	1 (1.3)	0
Guidance through the operating room	2 (2.7)	1 (0.9)

[a] Other used materials mentioned: Instruction how to use topical anesthesia patches, offering website information, the use of soap bubbles and virtual operating theater tour.

When asked whether the local structural conditions would generally allow the parents to be present until the children are anesthetized, 52 participants (63.4%) in the EG and 50 participants (45.0%) in the SG answered in the affirmative (*P*=.013). Among those, 38 respondents (46.3%) in the EG and 57 (50.9%) in the SG reported not offering parents to be present during the induction of anesthesia. In EG, 26 respondents (31.7%) reported enabling parental presence while 29 in SG (25,9%). Another 18 respondents (22%) in the EG stated that parental presence depends on the individual workplace within their institution, while 26 respondents (23.2%) in the SG reported the same.

The place where the children were separated from their parents or parental substitutes did not differ significantly between the groups (see figure 2).

Figure 2. Location where children are separated from their parents or parental substitute.



95.1% of respondents in EG and 99.1% in SG reported that children's anxiety is not routinely measured. Regarding anxiety scales, 31.7% of EG respondents (n=33) and 55.8% of SG respondents (n=67) stated that they were not familiar with any. The Yale Preoperative Anxiety Scale (YPAS) was the most recognized scale in the EG, with 25.0% (n=26) of respondents indicating familiarity with it. In contrast, only 8.3% (n=10) of respondents in the SG reported familiarity with the YPAS. The Visual Anxiety Scale (VAS) was the most recognized scale in the SG, with 30% (n=36) of respondents indicating familiarity with it. In contrast, only 24% (n=25) of respondents in the EG reported familiarity with the VAS.

Practices of pharmacological interventions

The use of pharmacological premedication in daily practice was reported by 80.5% of respondents in EG and 79.5% in SG, with no statistically significant difference between the two groups (*P*>.999), indicating that both groups have a similarly high rate of routinely use of premedication.

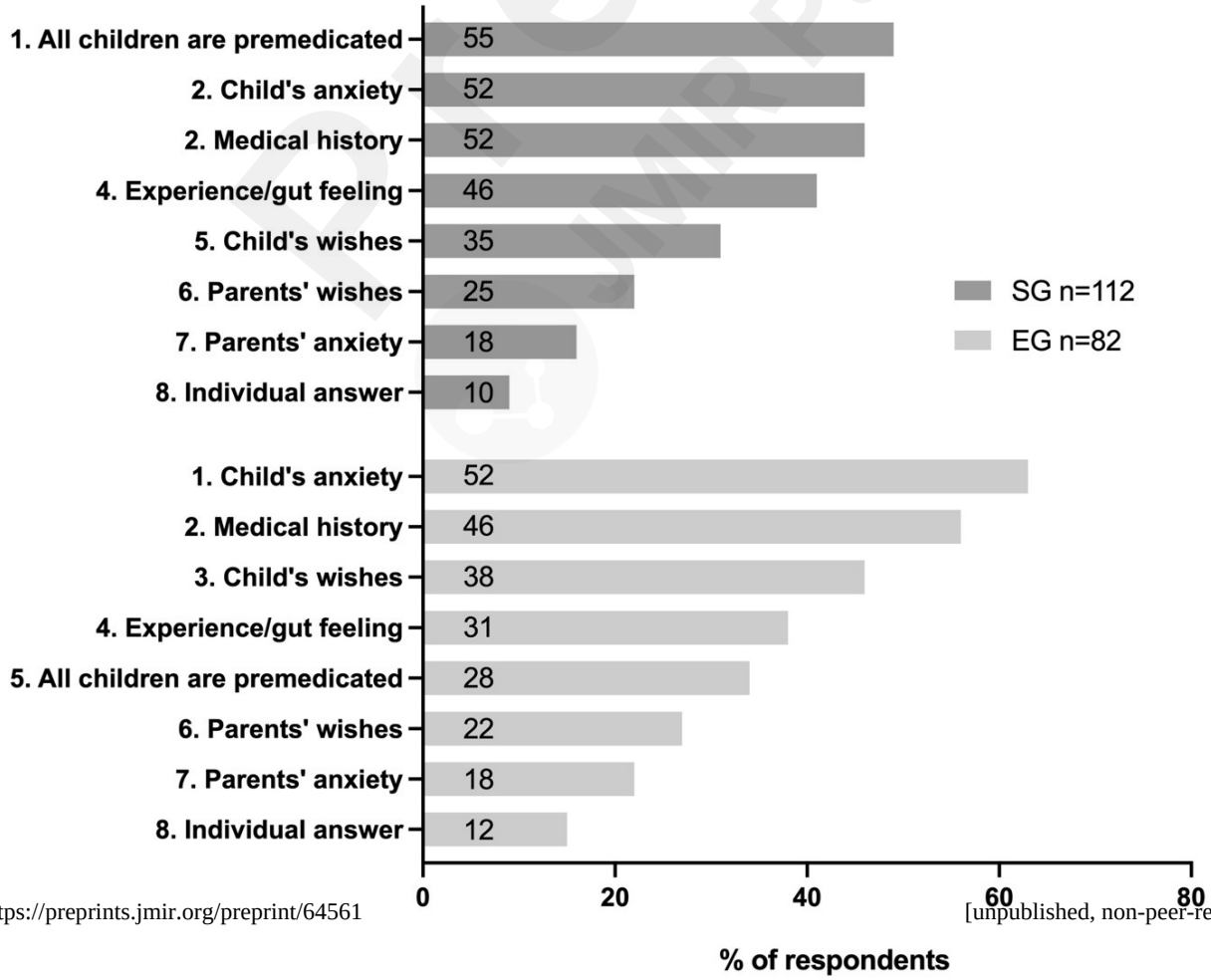
When it comes to actively avoiding premedication, there was a significant difference

between the two groups (*P*=.039). In EG, 50% (41 respondents) tried to avoid premedication, whereas only 34.4% (39 respondents) in the SG did so.

Both groups showed similar responses (*P*=.238) regarding their decision-making process for administering pharmacologic premedication (refer to figure 3). Individual responses included consulting children or their parents about the need for premedication, with some also specifying the placement of an intravenous line before anesthesia induction.

In both groups, midazolam was reported as the most frequently used premedication drug (EG 98.8% and SG 100%). In EG, (es-)ketamine (50.0%), clonidine (22%), and dexmedetomidine (7.3%) were used as well as in SG ((es-)ketamine 37.5%, clonidine 17.0%, dexmedetomidine 9.8%) without significant difference (*P*=.232). Overall, midazolam is the drug of first choice in both groups (95% in EG vs 94.6% in SG).
The median of minimum age for administering premedication was 6 months (6-8; 0-48) in EG and 9.5 months (6-12; 0-36) in SG (*P*<.001).

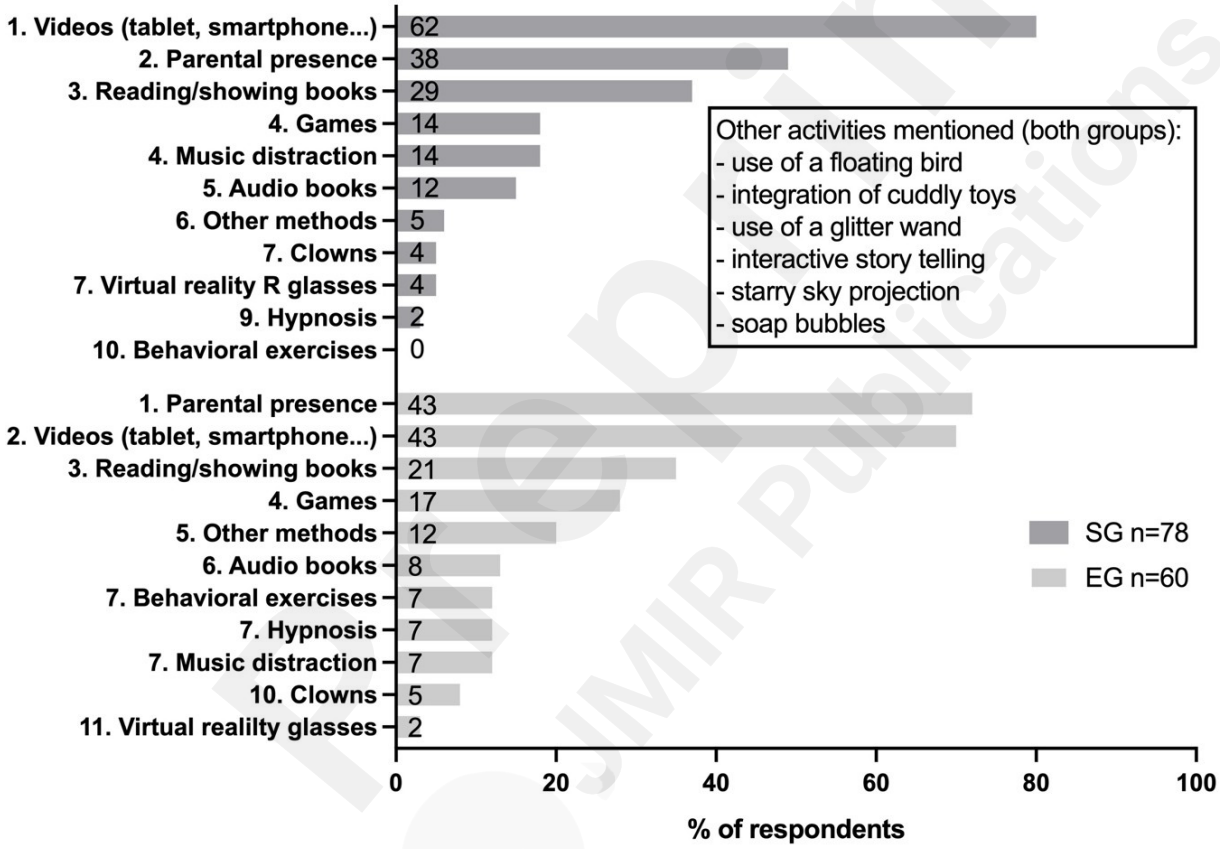
Figure 3. Criteria for deciding on premedication use with values (number on bar) and share (size of bar). Multiple answers were possible.



Practices of non-pharmacological interventions

Non-pharmacological interventions were routinely used by 60 (73.2%) respondents in EG and by 78 (69.6%) respondents in SG (*P*=.633). There was a significant difference (*P*<.001) in the selection of which non-pharmacological interventions were used (figure 4). While in the EG parental presence was the most commonly reported intervention (n=43, 71.7%), it was the use of videos in the SG (n=62, 79.5%).

Figure 4. Practices of non-pharmacological interventions with values (number on bar) and share (size of bar). Multiple answers were possible.



Discussion

Principal results

The respondents to the publicly announced survey on social media demonstrated significantly less pediatric anesthesia expertise than the respondents to the survey among experts. This was evidenced by fewer years of professional experience, fewer board-certified specialists, and a lower pediatric anesthesia case load. However, when looking at the items related to the practice of pediatric anxiety management, significant differences were found in less than a third. Regardless of survey group, our results showed very heterogeneous approaches to the management of preoperative anxiety in pediatric patients.

Our findings yield two principal findings. Firstly, it can be argued whether online surveys can be considered an effective method of reaching the target group of pediatric anesthesia providers. On the one hand, the respondents to the online survey rated their level of expertise lower than those who were involved in a scientific meeting survey. However, specific parameters that best identify an expert in the field of pediatric anesthesia remain undefined. It seems clear that increased experience in this field correlates with a lower rate of complications in children [20]. A high volume of pediatric anesthesia cases likely contributes to a higher level of expertise. Being classified as a specialist (board-certified anesthesiologist) further indicates that a minimum standard of experience in pediatric anesthesia has been met [21]. But having many years of professional experience does not necessarily equate to extensive pediatric anesthesia practice, as hospital structure, hospital focus, and patient demographics may limit exposure to pediatric cases [22,23]. Also, the higher share of institutions with a higher level of care and a higher number of children's hospitals among experts might indicate pediatric anesthesia expertise due to higher pediatric case load. But there may be also anesthesia providers with a high individual pediatric case load in standard care hospitals. On the other hand, when responses from an expert group exhibit significant heterogeneity [16], it is not unexpected that similar heterogeneity would persist when querying a larger (or another) sample.

This leads to the conclusion that it is not that obvious as our results may indicate which of the two groups can more accurately reflect the actual reality of pediatric anesthesia care.

Further, the methodology of online surveys offers significant advantages, particularly due to their rapid deployment and extensive reach, which facilitate the swift collection and distribution of data. The increasing importance of social media in the medical field underscores the value of these tools, as they enable the dissemination of insightful opinions and information [24-26]. Drawbacks are the inadequate representation of the sample population due to insufficient coverage, the absence of a sampling frame to guide sample selection, non-selection bias, and a low participation rate, which is estimated at approximately 11% in online surveys [27–29]. Of course, it is difficult to verify data quality with anonymous questions, and there is ongoing research into how to implement attention checks or other means of detecting poor quality data in web-based surveys [30]. With a participation rate of more than 80%, the EG directly addressed at the conference meeting demonstrated a high willingness to participate. Overall, slightly more responses were collected in the SG, even though access was open for an extended period, indicating a low response rate in this "digital" SG. This suggests that if a survey on a specific topic, such as anxiety in pediatric anesthesia, is announced via social media, it is likely that only a specific subset of individuals, those with a particular interest or relevance to the topic, will actively engage and participate.

The second point, apart from the discussion about whom to ask for pediatric anesthesia surveys, is what both groups have in common: There is a large heterogeneity in applied anxiety management practices. This includes the debated issue of parental presence during anesthesia induction. Although it does not reduce children's anxiety, children have the right to be accompanied by their parents or substitutes. Surprisingly, parental presence during induction remains uncommon [31,32]. Local conditions appear to inhibit parental presence, and even if it was possible in principle, it is often not implemented. Potential reasons for this could include the need for additional staff or carefully coordinated arrangements to manage the logistics of parental involvement, as well as considerations pertaining to hygiene.

The same heterogeneity exists in the question of when which child should receive premedication. This is shown by the many varying approaches regardless of the two survey groups. For sure, the child’s level of anxiety plays a relevant role in this decision-making process, but there is also a reported lack of application of anxiety measurement.

Interestingly, although more respondents in the EG were familiar with anxiety scales, neither the EG nor the SG used them in everyday clinical practice. Medication is currently made in a highly inconsistent manner, largely based on individual clinical judgment. When it comes to the application of medication, midazolam holds a high relevance in both groups. However, it has been proven to significantly reduce preoperative anxiety, it also has evident disadvantages including a long recovery time, respiratory adverse effects, and amnestic effects [6,7]. That may explain why all respondents reported to also use other premedication agents such as (es-)ketamine, clonidine and dexmedetomidine frequently [5]. In addition, the application of non-pharmacological interventions is heterogenous [15]. But if applicated, one of the most favored options is video distraction. This does not seem surprising since video distraction is easy to implement, widely available, and requires no training or infrastructure (unlike, for example, clowns).

Limitations

The study faced several limitations. First, it is prone to bias as there likely was a potential overrepresentation of more tech-savvy individuals in the SG, leading to a demographic discrepancy compared to the EG with potential risk for self-selection bias. Second, the reach of the web-based survey could not be sufficiently quantified, and attention checks were omitted, compromising information about the response rate and its quality. The survey was disseminated through a variety of social media platforms, but without considering social media usage statistics, which may have biased the sample. Additionally, the anonymity of the survey precluded verification of respondent accuracy.

Conclusion

The respondents from a scientific working group on pediatric anesthesia had more professional experience in this medical subspecialty and also more specific knowledge than survey participants from social media. However, when it comes to the use of strategies that reflect daily practice, the groups differed little and only in general terms. A diverse range of pharmacological and non-pharmacological interventions are employed in daily practice and their use seems to be based more on individual preferences. Consequently, there is a need for evidence-based recommendations regarding the appropriate use of these interventions, including indications for their use. Online surveys via social media can have the potential to gain insights into daily practice on specific topics like managing preoperative anxiety in

pediatric patients. Further studies should investigate whether surveys disseminated through social media yield similar results in other specific subject areas.

Acknowledgements

We would like to thank all participants of these surveys. Armin Sablewski would also like to thank his friend and podcast partner Dr. Gordon Fink. The integration of the podcast had no influence on this research work.

Conflict of Interest

Armin Sablewski is the host of a German-language podcast on pediatric anesthesia (“Kinderanästhesie-Talk”). The other authors don’t have any conflicts of interest to declare.

Abbreviations

EG: Expert Group
SG: Social Media Group

Multimedia Appendix

Survey (PDF)

Author’s contributions

Armin Sablewski: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data Curation, Investigation, Visualization, Writing - Original
Christine Eimer: Writing - Review & Editing, Validation.
Marcus Nemeth: Conceptualization, Methodology, Validation, Data Curation, Writing - Original Draft, Writing - Review & Editing.
Clemens Miller: Conceptualization, Methodology, Validation, Data Curation, Writing -

Original Draft, Writing - Review & Editing.

References

1. Safetots.org – Safe Anesthesia for Every Child. URL: https://www.safetots.org/ [accessed 2024-07-20]

2. Liu W, Xu R, Jia J, Shen Y, Li W, Bo L. Research Progress on Risk Factors of Preoperative Anxiety in Children: A Scoping Review. Int J Environ Res Public Health. 2022 Aug;19(16):9828. [doi: 10.3390/ijerph19169828]

3. Dahmani S, Delivet H, Hilly J. Emergence delirium in children: an update. Curr Opin Anaesthesiol. 2014 Jun;27(3):309-315. [doi: 10.1097/ACO.0000000000000076]

4. Kain ZN, Caldwell-Andrews AA, Maranets I, McClain B, Gaal D, Mayes LC, Feng R, Zhang H. Preoperative anxiety and emergence delirium and postoperative maladaptive behaviors. Anesth Analg. 2004 Dec;99(6):1648-1654. [doi: 10.1213/01.ANE.0000136471.36680.97]

5. Bromfalk Å, Myrberg T, Walldén J, Engström Å, Hultin M. Preoperative anxiety in preschool children: A randomized clinical trial comparing midazolam, clonidine, and dexmedetomidine. Paediatr Anaesth. 2021 Nov;31(11):1225-1233. [doi: 10.1111/pan.14279]

6. Lethin M, Paluska MR, Petersen TR, Falcon R, Soneru C. Midazolam for Anesthetic Premedication in Children: Considerations and Alternatives. Cureus. 2023 Dec;15(12):e50309. [doi: 10.7759/cureus.50309]

7. von Ungern-Sternberg BS, Erb TO, Habre W, Sly PD, Hantos Z. The impact of oral premedication with midazolam on respiratory function in children. Anesth Analg. 2009 Jun;108(6):1771-6. [doi: 10.1213/ane.0b013e3181a324c3]

8. Jaaniste T, Hayes B, von Baeyer CL. Providing children with information about forthcoming medical procedures: A review and synthesis. Clinical Psychology: Science and Practice 2007 May;14(2):124–143. [doi: 10.1111/j.1468-2850.2007.00072.x]

9. Kain ZN, Caldwell-Andrews AA, Krivutza DM, Weinberg ME, Gaal D, Wang SM, Mayes LC. Interactive music therapy as a treatment for preoperative anxiety in children: a randomized controlled trial. Anesth Analg. 2004 May;98(5):1260-1266. [doi: 10.1213/01.ane.0000111205.82346.c1]

10. Fortier MA, Chorney JM, Rony RY, Perret-Karimi D, Rinehart JB, Camilon FS, Kain ZN. Children's desire for perioperative information. Anesth Analg. 2009 Oct;109(4):1085-1090. [doi: 10.1213/ane.0b013e3181b1dd48]

11. DeMaso DR, Snell C. Promoting coping in children facing pediatric surgery. Semin Pediatr Surg. 2013 Aug;22(3):134-138. [doi: 10.1053/j.sempedsurg.2013.04.004]

12. Calipel S, Lucas-Polomeni MM, Wodey E, Ecoffey C. Premedication in children: hypnosis versus midazolam. Paediatr Anaesth. 2005 Apr;15(4):275-281. [doi: 10.1111/j.1460-9592.2004.01514.x]

13. Sola C, Devigne J, Bringuier S, Pico J, Coruble L, Capdevila X, Captier G, Dadure C. Hypnosis as an alternative to general anaesthesia for paediatric superficial surgery: a randomised controlled trial. Br J Anaesth. 2023 Mar;130(3):314-321. [doi: 10.1016/j.bja.2022.11.023]

14. O'Sullivan M, Wong GK. Preinduction techniques to relieve anxiety in children undergoing general anaesthesia. Continuing Education in Anaesthesia Critical Care & Pain 2013;13:196–199. [doi 10.1093/bjaceaccp/mkt014]

15. Kain ZN, Caldwell-Andrews AA, Mayes LC, Weinberg ME, Wang SM, MacLaren JE, Blount RL. Family-centered preparation for surgery improves perioperative outcomes in children: a randomized controlled trial. Anesthesiology. 2007 Jan;106(1):65-74. [doi: 10.1097/00000542-200701000-00013]

16. Sablewski A, Miller C, Nemeth M. Practice of preoperative anxiety management in paediatric anaesthesia. A questionnaire survey presented at the Annual Meeting of the Scientific Working Group on Paediatric Anaesthesia 2023. 2024;176–182. [doi: 10.19224/ai2024.176]

17. Pedersen MJ, Nielsen CV. Improving Survey Response Rates in Online Panels: Effects of Low-Cost Incentives and Cost-Free Text Appeal Interventions. Social Science Computer Review 2016;34(2):229-243. [doi: 10.1177/0894439314563916]

18. Kelley K, Clark B, Brown V, Sitzia J. Good practice in the conduct and reporting of survey research. Int J Qual Health Care. 2003 Jun;15(3):261-6. [doi: 10.1093/intqhc/mzg031]

19. Kinderanästhesie-Talk Podcast mit Armin und Gordon. URL: https://www.kinderanaesthesie-talk.de [accessed 2024-07-20]

20. Zgleszewski SE, Graham DA, Hickey PR, Brustowicz RM, Odegard KC, Koka R, Seefelder C, Navedo AT, Randolph AG. Anesthesiologist- and System-Related Risk Factors for Risk-Adjusted Pediatric Anesthesia-Related Cardiac Arrest. Anesth Analg. 2016 Feb;122(2):482-9. [doi: 10.1213/ANE.0000000000001059]

21. de Graaff JC, Frykholm P, Engelhardt T, Schindler E, Kovesi T, Simic D, Malagon I, Woodman N, Courtman S, Najafi N, Claussen NG, Karlsson J, Bonhomme F, Laffargue A, Vutskits L. Pediatric anesthesia in Europe: Variations within uniformity. Paediatr Anaesth. 2024 Feb; Epub ahead of print. [doi: 10.1111/pan.14873]

22. Auroy Y, Ecoffey C, Messiah A, Rouvier B. Relationship between complications of pediatric anesthesia and volume of pediatric anesthetics. Anesth Analg. 1997 Jan;84(1):234-5. [doi: 10.1097/00000539-199701000-00060]

23. Habre W, Disma N, Virag K, Becke K, Hansen TG, Jöhr M, Leva B, Morton NS, Vermeulen PM, Zielinska M, Boda K, Veyckemans F; APRICOT Group of the European Society of Anaesthesiology Clinical Trial Network. Incidence of severe critical events in paediatric anaesthesia (APRICOT): a prospective multicentre observational study in

261 hospitals in Europe. Lancet Respir Med. 2017 May;5(5):412-425. [doi: 10.1016/S2213-2600(17)30116-9]

24. Yeung AWK, Tosevska A, Klager E, Eibensteiner F, Tsagkaris C, Parvanov ED, Nawaz FA, Völkl-Kernstock S, Schaden E, Kletecka-Pulker M, Willschke H, Atanasov AG. Medical and Health-Related Misinformation on Social Media: Bibliometric Study of the Scientific Literature. J Med Internet Res. 2022 Jan 25;24(1):e28152. [doi: 10.2196/28152]

25. Tan JM, Simpao AF, Gálvez Delgado JA. The Future of Social Media, Anesthesiology, and the Perioperative Physician. Anesth Analg. 2024 Feb;138(2):358-368. [doi: 10.1213/ANE.0000000000006711]

26. Klucka J, Kosinova M, Zacharowski K, De Hert S, Kratochvil M, Toukalkova M, Stoudek R, Zelinkova H, Stourac P. Rapid sequence induction: An international survey. Eur J Anaesthesiol. 2020 Jun;37(6):435-442. [doi: 10.1097/EJA.0000000000001194]

27. Couper MP. Issues of representation in eHealth research (with a focus on web surveys). Am J Prev Med. 2007 May;32(5 Suppl):S83-9. [doi: 10.1016/j.amepre.2007.01.017]

28. Cook DA, Wittich CM, Daniels WL, West CP, Harris AM, Beebe TJ. Incentive and Reminder Strategies to Improve Response Rate for Internet-Based Physician Surveys: A Randomized Experiment. J Med Internet Res. 2016 Sep 16;18(9):e244. [doi: 10.2196/jmir.6318]

29. Sammut R, Griscti O, Norman IJ. Strategies to improve response rates to web surveys: A literature review. Int J Nurs Stud. 2021 Nov;123:104058. [doi: 10.1016/j.ijnurstu.2021.104058]

30. Braitman AL, Strowger M, Shipley JL, Ortman J, MacIntyre RI, Bauer EA. Data Quality and Study Compliance Among College Students Across 2 Recruitment Sources: Two Study Investigation. JMIR Form Res. 2022 Dec 9;6(12):e39488. [doi: 10.2196/39488]

31. Shih MC, Elvis PR, Nguyen SA, Brennan E, Clemmens CS. Parental Presence at Induction of Anesthesia to Reduce Anxiety: A Systematic Research and Meta-Analysis. J Perianesth Nurs. 2023 Feb;38(1):12-20. [doi: 10.1016/j.jopan.2022.03.008]

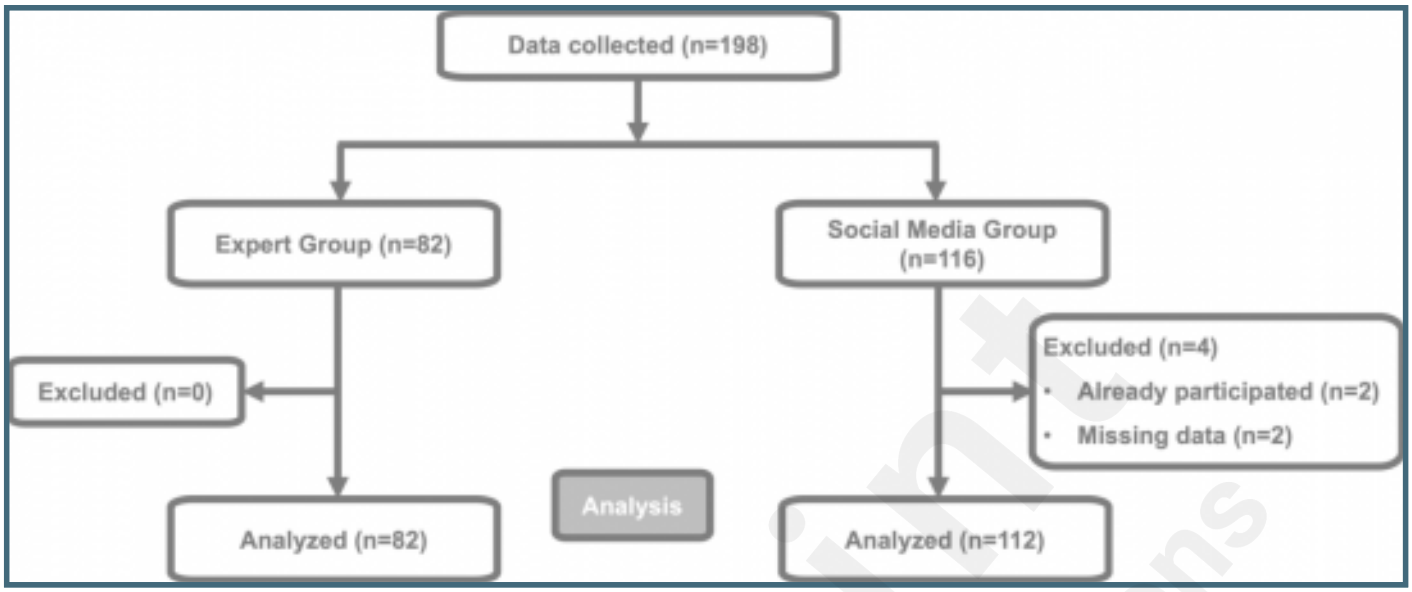
32. Manyande A, Cyna AM, Yip P, Chooi C, Middleton P. Non-pharmacological interventions for assisting the induction of anaesthesia in children. Cochrane Database Syst Rev. 2015 July;2015(7):CD006447. [doi: 10.1002/14651858.

Supplementary Files

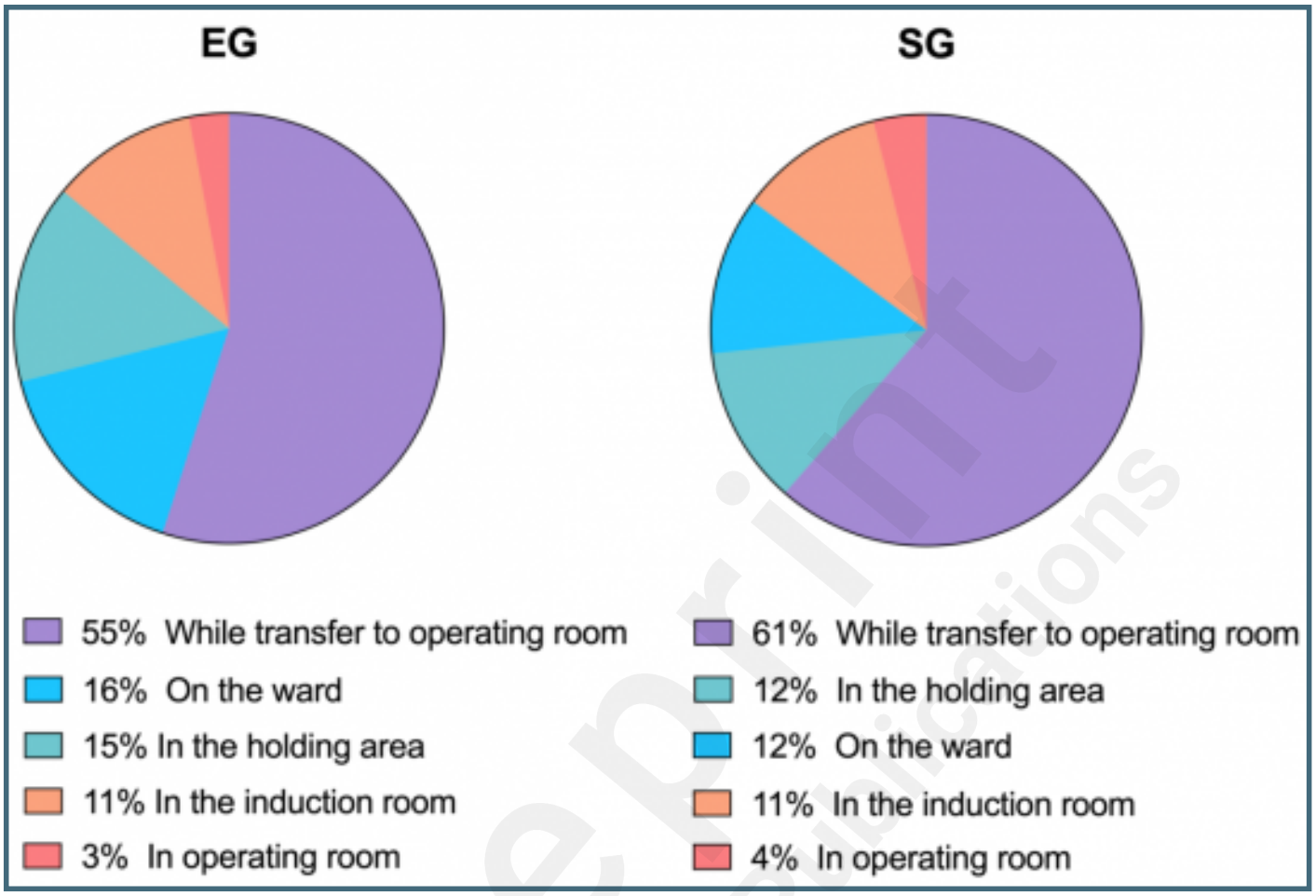
Untitled.
URL: http://asset.jmir.pub/assets/97e76cd1ebd7a0344728689df0e9631d.docx

Figures

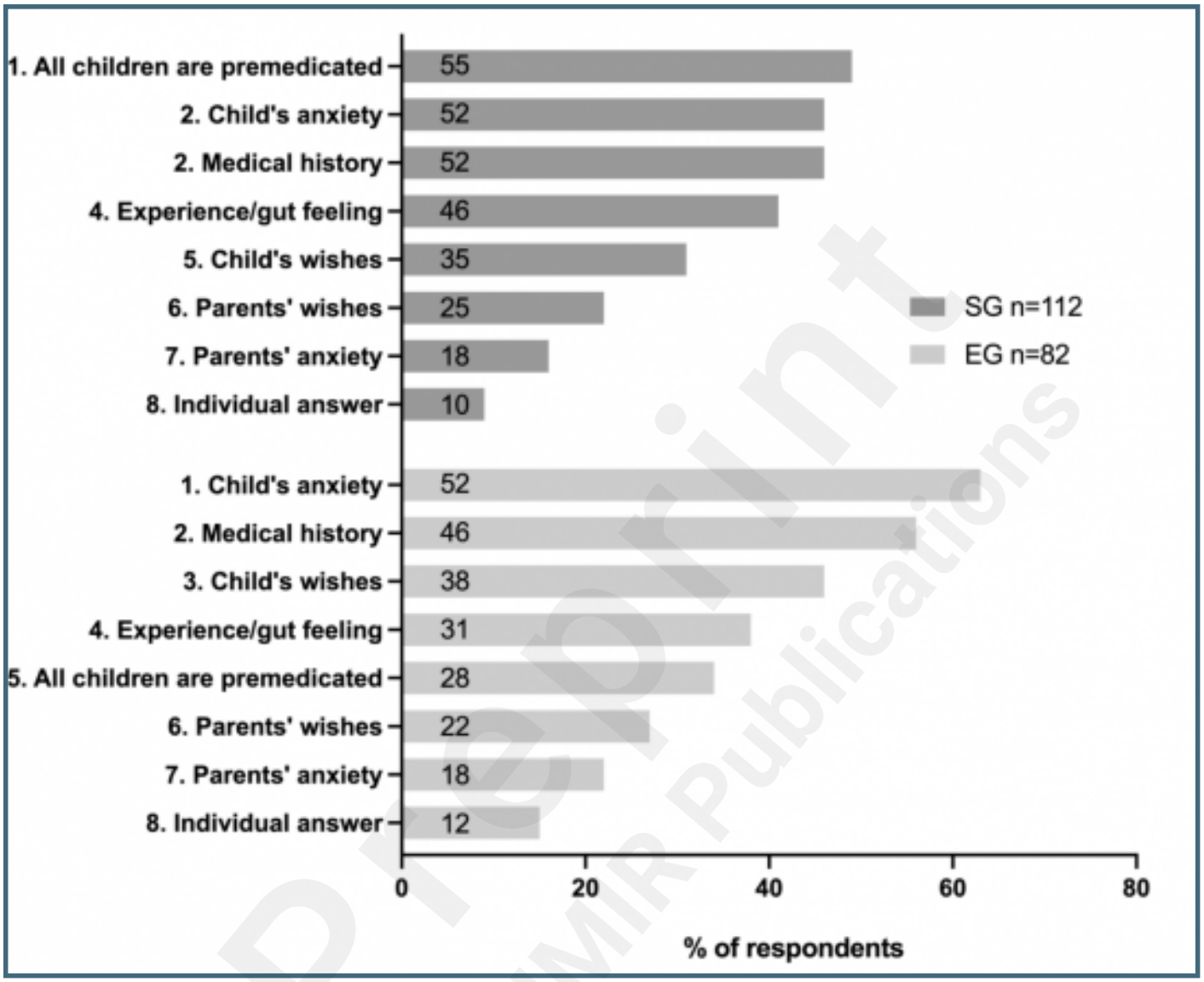
Data report.



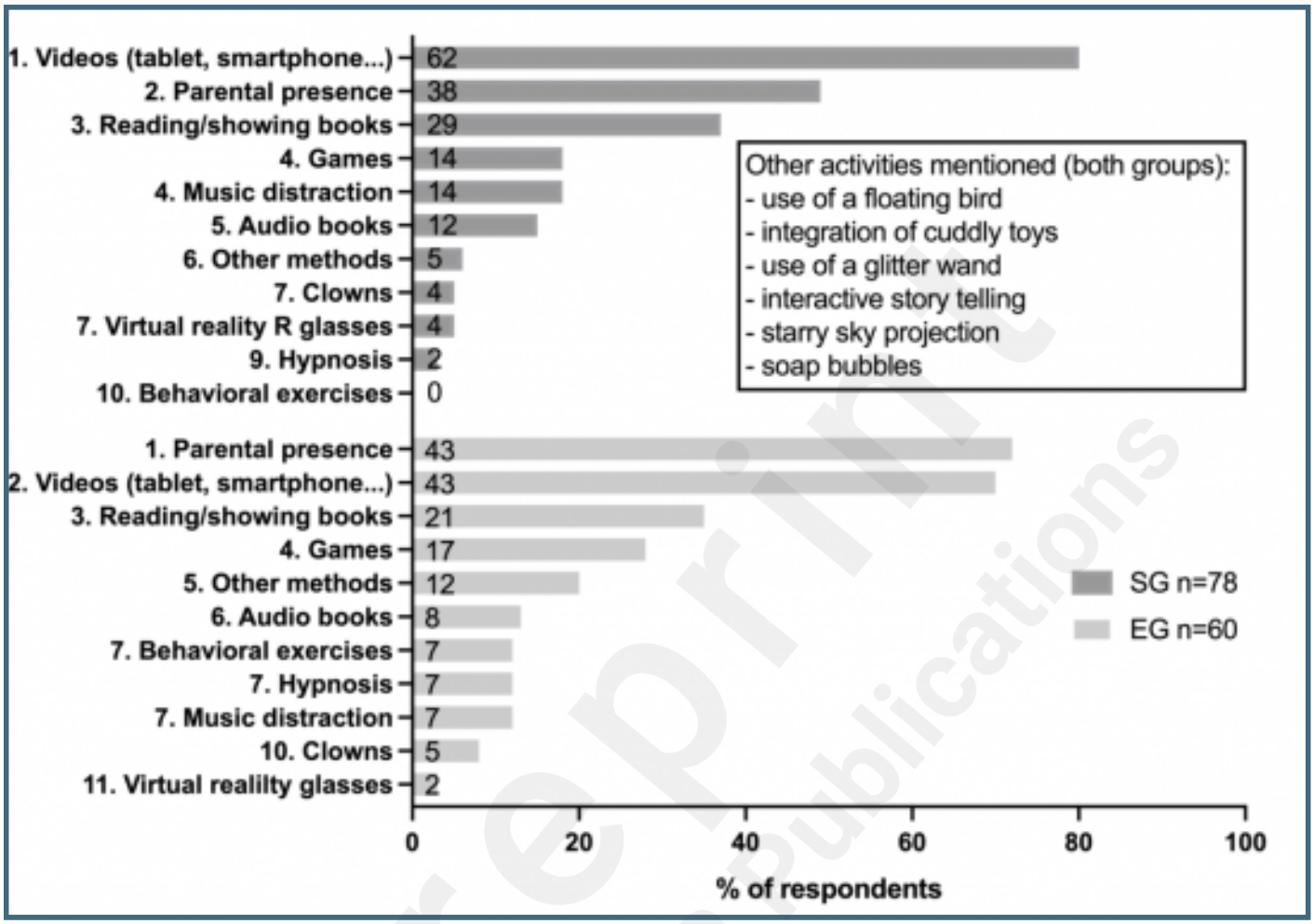
Location where children are separated from their parents or parental substitute.



Criteria for deciding on premedication use with values (number on bar) and share (size of bar). Multiple answers were possible.



Practices of non-pharmacological interventions with values (number on bar) and share (size of bar). Multiple answers were possible.



Multimedia Appendixes

Survey to „Preoperative Anxiety Management Practices in Pediatric Anesthesia: A Comparative Analysis of an Online Survey presented to Experts and Social Media Users“.
URL: http://asset.jmir.pub/assets/baaa508f097c4041b39b783d9d2d0dcb.docx

CONSORT (or other) checklists

CONSORT Checklist.
URL: http://asset.jmir.pub/assets/920fa8c2ec648ed32d29761624a907fc.pdf