



Difference of Parental Level of Concerns on Surgery according to the Perspectives and Characteristic among Pediatrics with Intermittent Exotropia

Seongyong Jeong¹, So Young Han², Sunghyuk Moon³, Donghun Lee⁴, Sook Young Kim⁴, Mirae Kim⁵, Jihyun Park^{5†}, Myung Mi Kim⁵, Won Jae Kim¹

¹Department of Ophthalmology, Yeungnam University College of Medicine, Daegu, Korea

²Department of Ophthalmology, Kangbuk Samsung Hospital, Sungkyunkwan University School of Medicine, Seoul, Korea

³Department of Ophthalmology, Inje University Busan Paik Hospital, Busan, Korea

⁴Department of Ophthalmology, Daegu Catholic University School of Medicine, Daegu, Korea

⁵Nune Eye Hospital, Deagu, Korea

Purpose: To evaluate the differences in the level of concerns regarding exotropia surgery according to the perspectives regarding surgery and basic characteristics of parents of pediatric patients with intermittent exotropia in South Korea.

Methods: This study included the parents of pediatric patients with intermittent exotropia who underwent surgery at five hospitals, between June 2022 and February 2023. Parental perspectives, basic characteristics, and levels of concern regarding surgery were assessed using a questionnaire. We investigated the differences in concern levels according to perspectives regarding surgery and basic characteristics among parents, such as sex, age, residential area, and the most influential factors in the decision-making for surgery.

Results: A total of 266 parents were included (228 mothers; age, 40.0±4.7 years). Parents who chose surgery for subjective symptoms had higher levels of concern about hemorrhage, conjunctival redness, and persistent overcorrection than did those who chose surgery for cosmetic reasons (all $p < 0.05$). Fathers were more concerned about postoperative pain, compared to mothers ($p = 0.039$). Parents in their 40s and 50s had higher levels of concern about the hospital environment compared with those in their 20s and 30s ($p = 0.003$). Concern did not significantly differ by residential area.

Conclusions: The level of concern regarding surgery differed according to the perspectives and characteristics of the parents of pediatric patients with intermittent exotropia. Parents who chose surgery for subjective symptoms of exotropia had a higher level of concern than did those who chose surgery for cosmetic reasons. The concern level differed according to the parents' sex and age but not their residential area.

Key Words: Exotropia, Strabismus, Surgery

Received: July 21, 2024 Final revision: October 31, 2024 Accepted: December 2, 2024

Corresponding Author: Won Jae Kim, MD. Department of Ophthalmology, Yeungnam University College of Medicine, 170 Hyeonchung-ro, Nam-gu, Daegu 42415, Korea. Tel: 82-53-620-3444, Fax: 82-53-626-5936, Email: eyekwj@gmail.com

[†]Current affiliation: The First Eye Clinic, Daegu, Korea

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Intermittent exotropia is the most common type of exotropia in the Asian population, particularly in Koreans [1]. Surgical treatment is usually required to improve ocular alignment and sensory function. In the process of surgical treatment for pediatric patients with intermittent exotropia, parents may be concerned about the surgery, postoperative progress, and possible complications. Previously, we evaluated the perspectives and concerns regarding surgery among parents of pediatric patients with intermittent exotropia using a questionnaire and compared the responses to clinicians' predictions of parental responses [2]. Parental perspectives and concerns regarding pediatric intermittent exotropia surgery differed from those predicted by clinicians.

The concern level of parents can vary based on several factors, including their perspective regarding surgery and basic characteristics, such as sex, residential area, education level, and number of social contacts [3,4]. Recognizing the differences in the concern level of parents according to these factors can enable more customized communication and improve communication between parents and clinicians. However, a previous study did not investigate the differences in concern level of parents according to their perspective regarding surgery and basic characteristics. Therefore, this study aimed to evaluate the differences in the concern level of parents according to their perspectives regarding surgery and basic characteristics in South Korea.

Materials and Methods

Ethics statement

This study was approved by the Institutional Review Board of Yeungnam University Hospital (No. 2024-07-027). Informed consent was obtained from all participating parents. The study was performed in accordance with the tenets of the Declaration of Helsinki.

Study design

This survey included parents of pediatric patients with intermittent exotropia who underwent surgery at five hospitals (Yeungnam University Hospital, Daegu, Korea; Kangbuk Samsung Hospital, Seoul, Korea; Inje University Busan Paik Hospital, Busan, Korea; Daegu Catholic Medical Center, Daegu, Korea; and Nune Eye Hospital, Daegu,

Korea) between June 2022 and February 2023. Five hospitals from three cities in South Korea participated in this study (Seoul, Busan, and Daegu). All hospitals were situated in the metropolitan areas of Korea. Parents of children with the basic type of exotropia, defined as a difference between distant and near angles within 10 prism diopters, were included in this study. Patients with concomitant vertical deviation, a history of ocular or systemic surgery, or neurological impairment were excluded. Foreign parents were excluded because they did not understand the questionnaire.

Assessment of parental perspectives and levels of concern regarding exotropia surgery

Parental perspectives and levels of concern regarding exotropia surgery were assessed using a questionnaire in Korean (Supplementary Material 1, translated into

Table 1. Basic characteristics of the participated parents of the pediatric patients with intermittent exotropia

Characteristic	Value (n = 266)
Sex	
Male	38 (14.3)
Female	228 (85.7)
Age (yr) (n = 257)	40.0 ± 4.7 (20–52)
20–39	113 (44.0)
40–59	144 (56.0)
Residential area	
Metropolitan area	149 (56.0)
Nonmetropolitan area	117 (44.0)
Interval between clinician’s initial recommendation and parental decision of surgery	
Right away	88 (33.1)
<6 mon	40 (15.0)
6 mon–1 yr	51 (19.2)
>1 yr	87 (32.7)
Most influential factor in the decision of surgery (n = 263)	
Cosmetic problems	86 (32.7)
Recommendation of clinician	82 (31.2)
Subjective ocular discomfort (diplopia, asthenopia, blurred vision, etc.)	95 (36.1)

Values are presented as number (%) or mean ± standard deviation (range).

English). Informed consent was obtained from all participating parents, and a structured 10-item questionnaire was provided. The patients were hospitalized 1 day before the surgery. The questionnaire was provided to parents during hospitalization. The questionnaire comprised three main parts. In the first part, questions were asked to evaluate parental perspectives toward exotropia surgery, including how they obtained information about surgery and communicated with their child about the upcoming surgery, and level of anxiety of the child regarding the surgery, as felt by the parents. In the second part, questions were asked to evaluate the parents' level of concern regarding the general items of surgery and the short- and long-term follow-up items after surgery. Participants rated their level of concern on each item on a 5-point Likert scale. A higher number indicates a higher concern level, and a lower number indicates a lower concern level. In the third part, questions regarding basic parental information, including sex, age, residential region, interval between the clinician's initial recommendation of surgery and parental decision for surgery, and the most influential factor in the decision-making for surgery were asked. Parents who responded to all questions with the single number, 5 ("very concerned"), in the

second part of the questionnaire were excluded from the study because their participation in the questionnaire survey was not considered sincere.

Comparison of the level of concern regarding exotropia surgery according to the perspectives and basic characteristics of parents

We investigated the differences in the levels of concern of parents regarding exotropia surgery according to their perspectives regarding surgery and basic characteristics. The responses of parents were analyzed using the unpaired *t*-test, chi-square test, and analysis of variance test. Data were analyzed using IBM SPSS ver. 20.0 (IBM Corp). Statistical significance was set at $p < 0.05$.

Results

Basic characteristics of the included parents of pediatric patients with intermittent exotropia

The basic characteristics of the parents of the pediatric

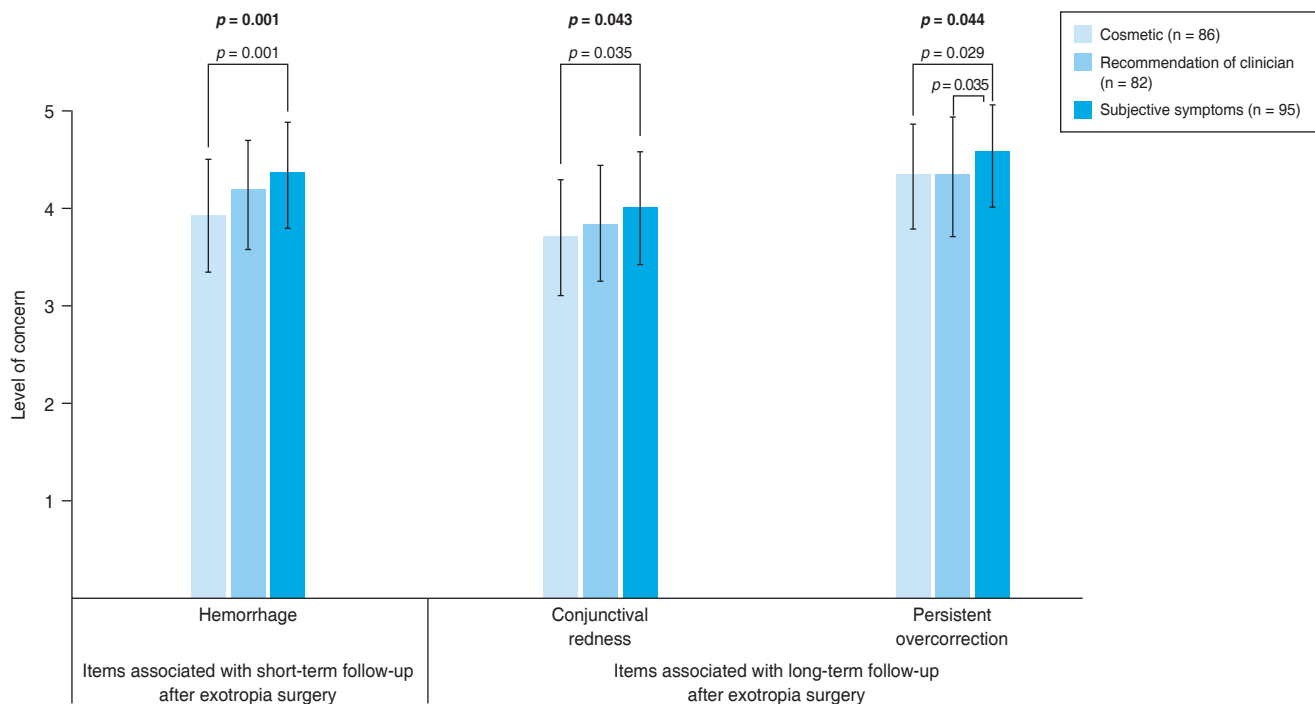


Fig. 1. Comparison of parental level of concern regarding exotropia surgery according to the most influential factor in decision-making for surgery in pediatric patients with intermittent exotropia. Parents who chose surgery for subjective symptoms (diplopia, asthenopia, blurred vision, etc.) of their children had higher levels of concerns about hemorrhage ($p = 0.001$), conjunctival redness ($p = 0.043$), and persistent overcorrection ($p = 0.044$) compared with those who chose surgery for cosmetic reasons.

patients with intermittent exotropia included in this study are shown in Table 1. Overall, 266 parents (age, 40.0 ± 4.7 years) were included in the analysis. More mothers ($n = 228$) than fathers ($n = 38$) participated in the survey. Approximately two-thirds of the parents lived in metropolitan areas. The most influential factors in decision-making for surgery showed a similar distribution among the included parents.

Difference in the level of concern of parents according to their perspective and basic characteristics

There were significant differences in the level of concern about hemorrhage ($p = 0.001$), conjunctival redness ($p = 0.043$), and persistent overcorrection ($p = 0.044$), according to the reason for opting for surgery (Fig. 1). Parents who opted for surgery for subjective symptoms of exotropia demonstrated a higher level of concern than did those who chose surgery for cosmetic reasons. There was no significant difference in the concern level of parents according to their main source of information and method of

communication with children regarding the upcoming surgery (all $p > 0.05$). Differences in the level of concern between fathers and mothers are shown in Fig. 2. Fathers had a higher level of concern about postoperative pain than did mothers ($p = 0.039$). The other items of the questionnaire did not show significant differences between the responses of fathers and mothers. The difference in concern level of parents according to their age is shown in Fig. 3. Parents in their 40s and 50s showed a higher level of concern about the hospital environment compared with those in their 20s and 30s ($p = 0.003$). There was no significant difference in the concern level according to the parent's residential area and interval between the clinician's initial recommendation and the parental decision for surgery (all $p > 0.05$).

Discussion

The level of concern regarding surgery of parents of pediatric patients with intermittent exotropia differed according to their perspective regarding surgery and basic

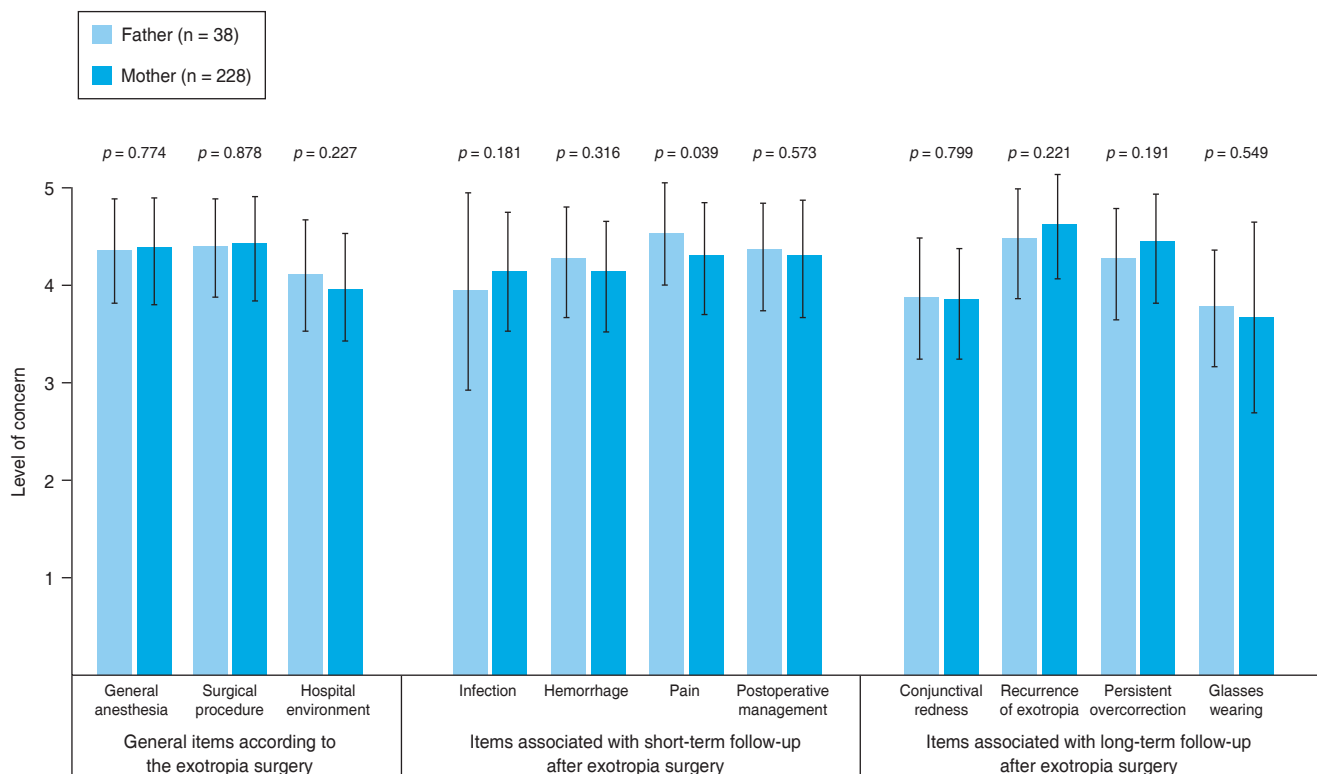


Fig. 2. Comparison of level of concern regarding exotropia surgery between fathers and mothers of pediatric patients with intermittent exotropia. Fathers had a higher level of concern about postoperative pain, compared to mothers ($p = 0.039$). Other items of the questionnaire survey did not show any significant differences between the responses of fathers and mothers.

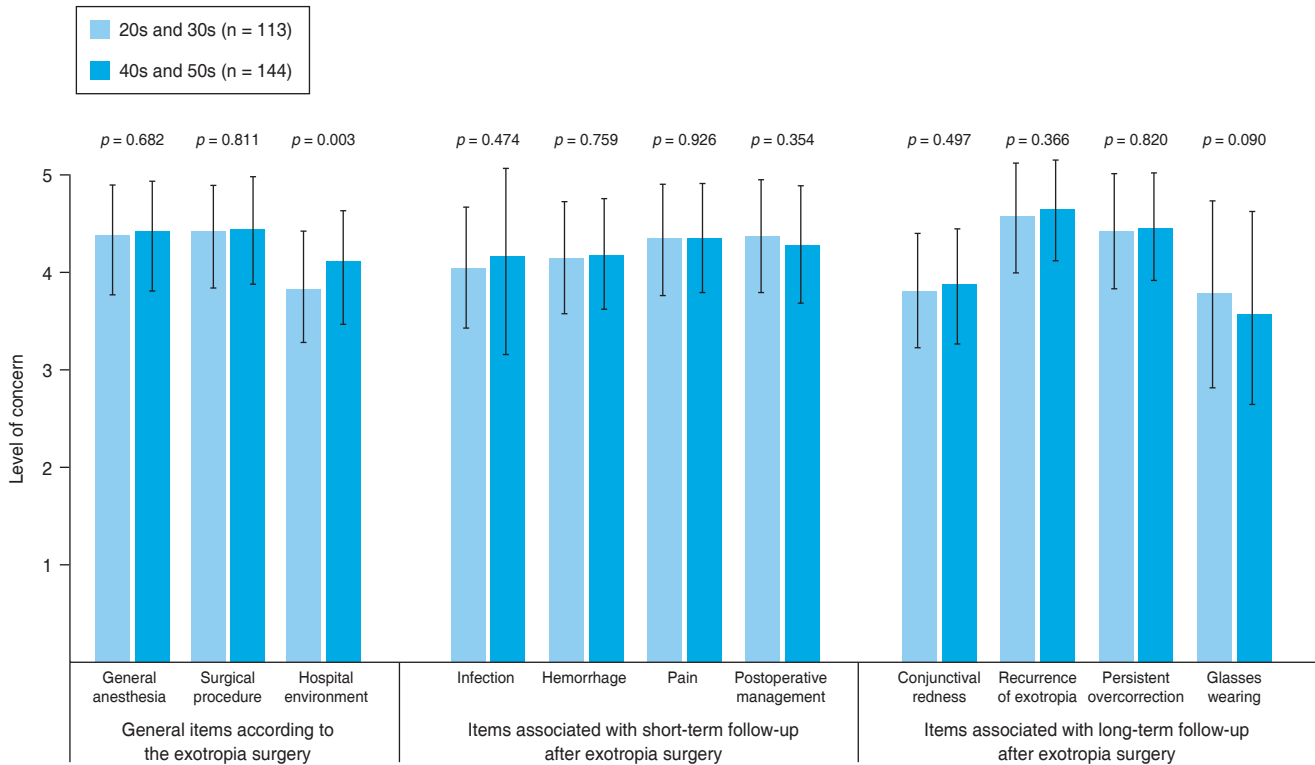


Fig. 3. Comparison of level of concern regarding exotropia surgery according to the age of the parents of pediatric patients with intermittent exotropia. Parents in their 40s and 50s showed a higher level of concern about hospital environment compared with those in their 20s and 30s ($p = 0.003$). Other items of the questionnaire survey did not show any significant differences according to the age of the parents.

characteristics in South Korea. Parents who chose surgery for subjective symptoms of exotropia had a higher level of concern about hemorrhage, conjunctival redness, and persistent overcorrection than did those who chose surgery for cosmetic reasons. The concern level of parents differed according to their sex and age but not their residential area.

Parents are usually involved in the medical decision-making processes for their children [5,6]. Delivery of accurate and appropriate information about surgery and relief of parental concerns are essential parts of preoperative care [5,7]. There may be a difference in the understanding and level of concern of the disease according to the parents. Understanding these differences may help improve the relationship between parents and clinicians. Therefore, we evaluated differences in the level of concern of parents according to their perspective regarding surgery and basic characteristics.

Parents who chose surgery for subjective symptoms of exotropia had higher levels of concern about hemorrhage, conjunctival redness, and persistent overcorrection than

did those who chose surgery for cosmetic reasons. Parents focusing on surgery to alleviate subjective symptoms of their children may be more concerned about potential complications because they seek to improve their children's functional abilities. They may have been more focused on the outcomes and possible risks related to functional improvement, leading to a higher level of concern. In contrast, parents who chose surgery for cosmetic reasons were likely more focused on achieving immediate postoperative ocular alignment and cosmetic results, making them less concerned about other potential side effects.

The parental level of concern about exotropia surgery differed according to basic characteristics of parents. Fathers were more concerned about postoperative pain than mothers. This finding contrasts with the study by Scrimin et al. [3], who noted that parents, particularly mothers, tend to be anxious about their children's minor surgical procedures. Nadeau et al. [8] investigated the parental recall of the key surgical risks and general surgical information of pediatric surgery after counseling. They reported that

maternal parents appear to recall surgical risks significantly better than paternal parents. We postulated that mothers are more likely to be attentive to the needs and risks of surgery, which may result in a lower level of concern about surgery compared to fathers.

Parents in their 40s and 50s showed a higher level of concern about the hospital environment compared with those in their 20s and 30s. Healthcare experiences and access may vary between young and older adults [4]. Young adults frequently report worse healthcare experiences and access than older adults [4]. Young adults' poor access to and experience with care could reflect a lack of experience in navigating complex health systems. We postulated that older parents may have more medical experience and consider hospital environments to be more crucial than younger parents do. This may lead to higher levels of concern about hospital environments among parents in their 40s and 50s than among parents in their 20s and 30s.

Interestingly, in this study, the level of concern of parents did not differ according to their residential area. Russo et al. [9] showed that families living far away from hospitals were more likely to search for health information. In this study, parents responded that internet search was the most common method for obtaining information about surgery. South Korea possesses the world's most advanced and efficient internet infrastructure and seeking health information via online searches has become the mainstream method [10]. We hypothesized that the advancement of the internet and ease of access to medical information could help reduce the disparity in medical knowledge caused by geographical barriers.

Parental concern about pediatric disease may be influenced by social or cultural backgrounds [11,12]. Therefore, our results may have limitations in their generalizability to all parents of patients with intermittent exotropia. Nevertheless, this is the first study to evaluate the level of concern regarding exotropia surgery among parents of pediatric patients with intermittent exotropia. It is natural for parents to worry about their child's disease and surgical treatment. A quantitative assessment of the level of concern regarding various surgical items can identify which items parents are more worried about. More attention should be paid to the surgical items that parents are most worried about, considering the characteristic differences among parents during preoperative discussions [13].

Previous studies have shown that there is about 1 in 400

risk of severe complications, but less than 1 in 2,000 risk of significant complication for strabismus surgery [14]. Complications after strabismus surgery are relatively uncommon. However, it is important for parents to have in-depth discussions with clinicians, who can provide correct and appropriate information regarding their child's condition, the benefits and limitations of surgery, and possible complications. Our results may be helpful in providing information tailored to the parents' perspectives on surgery.

This study has some limitations. First, the attitudes and levels of concern regarding surgery of the patients were not evaluated. Some pediatric patients may be old enough to express their attitudes and concerns regarding surgery through questionnaires. In addition, the number of strabismus surgeries performed in adults has increased significantly. Understanding not only the parental view but also the patient's view of surgery can improve the overall surgical process. Second, the greater number of mothers participated in the study compared with fathers. This may be because mothers are often the primary caregiver and more actively involved in their child's healthcare decision [15]. These factors suggest the need for strategy to better engage both parents in future study.

In conclusion, the level of concern regarding surgery differed according to the perspectives and characteristics of the parents of pediatric patients with intermittent exotropia. Parents who opted for surgery due to subjective symptoms of exotropia expressed a higher level of concern than those who chose surgery for cosmetic reasons.

Conflicts of Interest: None.

Acknowledgements: None.

Funding: None.

Supplementary Materials

Supplementary Material 1. Questionnaire on parental attitudes and levels of concern regarding surgery in pediatric patients with intermittent exotropia translated into English.

Supplementary materials are available from <https://doi.org/10.3341/kjo.2024.0090>.

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Supplementary Material 1. Questionnaire on parental attitudes and levels of concern regarding surgery in pediatric patients with intermittent exotropia translated into English.

Questionnaire on parental attitudes and levels of concern regarding surgery in pediatric patients with intermittent exotropia. Choose one option or describe any problem that has not been addressed.

Express your own observations or impressions only.

Part I. Questions evaluating parental attitude toward exotropia surgery

1. What is the most common (or helpful) method of obtaining information about exotropia surgery?
 - ① Face-to-face information from clinicians
 - ② Internet search (including SNS)
 - ③ Other (Book or through acquaintances), If there be any other sources, please feel free to write down
2. How anxious is your child about the exotropia surgery?
 - ① Not at all anxious ② Anxious ③ Very anxious
3. How did you communicate with your child about the upcoming surgery?
 - ① Try to avoid talking about it as much as possible
 - ② Answer when asked, but not beforehand/ not proactively
 - ③ Actively inform the child about the surgery

Part II. Questions evaluating parental level of concern toward exotropia surgery

Choose one option or describe any problems that has not been addressed. Express your own observations or impressions only. A higher number indicates a higher level of concern, and a lower number indicates a lower level of concern.

1. General items according to the exotropia surgery

	Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
General anesthesia	①	②	③	④	⑤
Surgical procedure	①	②	③	④	⑤
Hospital environment	①	②	③	④	⑤

2. Items associated with short-term follow-up after exotropia surgery

	Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
Infection	①	②	③	④	⑤
Hemorrhage	①	②	③	④	⑤
Pain	①	②	③	④	⑤
Postoperative management	①	②	③	④	⑤

3. Items associated with long-term follow-up after exotropia surgery

	Very unconcerned	Unconcerned	Neutral	Concerned	Very concerned
Conjunctival redness	①	②	③	④	⑤
Recurrence of exotropia	①	②	③	④	⑤
Persistent overcorrection	①	②	③	④	⑤
Glasses wearing	①	②	③	④	⑤

Part III. Questions evaluating parental basic information

1. What is your age and sex? (parents)
2. Where is your residential area (name of city)?
3. How long did it take for you to decide of your child's surgery after clinician's recommendation of surgery?
① Right away ② Less than 6 months ③ 6 months – 1 year ④ More than a one year
4. What is the most influential factor in the decision of surgery for your child?
① Cosmetic problems
② Recommendation of clinicians
③ Subjective eye discomfort of child (diplopia, asthenopia, blurred vision...)