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# Effects of preoperative at-home preparation on children's behavioral outcomes in Japan

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ABSTRACT

**Introduction:** The objective of the study is to determine the effects of at-home psychological preparation mainly on adjustment in the aspect of children's behavior in a randomized controlled trial as an exploratory and pragmatic clinical trial.

**Methods:** The eligible patients were randomly assigned to either of two groups that both watched a preparation video once as outpatients in a group of other patients prior to hospitalization ("standard care"); the control group later underwent surgery without any further preparation; the experimental group watched the same video repeatedly in reference to an auxiliary booklet at home with their caregivers prior to hospitalization.

**Results:** No beneficial impact of at-home preparation program was determined on the children's behavioral outcomes. However, children in the experimental group showed no higher upset in OR and no more negative behavioral changes after discharge than the controls. Over 90% of the caregivers in the experimental group expressed satisfaction with at-home preparation.

**Discussion:** These results suggested that at-home preparation program has no impact on the patients but resulted in high satisfaction from the caregivers in the experimental group.

**Conclusion:** At-home preparation program using video and booklet had no beneficial impact on the behavioral outcomes of children undergoing minor surgery. However, it can be highly a desired program to prepare small children and their caregivers for surgical hospitalization.



## 1. Introduction

A preponderance of the literature also views surgery accompanied by hospitalization as a stressful, anxiety-producing experience that can lead to either transient or long-term psychological disturbance in a majority of children [1–10], and indicates the need for psychological support for all children receiving medical care [11–14].

Studies of hospitalized children have revealed that "preschool" children are relatively upset by a crucial event such as "surgery" or "hospitalization," and that very young children under 3 years of age would not benefit psychologically from the psychoeducational interventions [1,8,15–17]. The preschool years comprise the period from 3 to 5 years of age, a time considered critical for emotional, language, and psychological development [18].

It has been considered essential that preparing preschool children for upcoming procedures decreases their anxiety, promotes their cooperation, supports their coping skills and may teach them new ones, and facilitates a feeling of mastery in experiencing a potentially stressful event at hospital [14,19–23]. To reduce their anxiety, audio-visual information materials are most effective for younger patients who are beginning to communicate verbally [22]. Thus, many studies have emphasized the importance of preparing preschool children for surgery and hospitalization. Vernon and Thompson also revealed the benefits of preoperative experimental interventions on children's behavior after hospitalization in their review and synthesis [24].

Our previous study of children ages 4–7 years undergoing elective herniorrhaphy in hospital revealed that 1) young patients were already distressed on admission and maintained distress during hospitalization; 2) 54.2% of children showed negative behavior changes after leaving the hospital, "separation anxiety" being particularly high at 45.8%, and behaviors such as "crying at night (33.3%)," "temper tantrums (20.8%)," and "needing help to do things (20.8%)"; and 3) relief of anxiety including children's distress and psychological upset is associated with the "child's understanding their experiences associated with surgery and hospitalization," and indicated the need for psychological support for young Japanese children undergoing surgery [25,26].

Considering the style of preparation program appropriate in Japan, the main caregiver was considered the best qualified person to prepare children for routines, items, procedures, and all events of

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illness, surgery, and hospitalization. The main caregivers can elicit and accept the child's feelings while understanding their child's insufficient communications skills and providing more spiritual support to children than anyone else. Furthermore, children can undergo a preparation program more calmly at home than at hospital. Thus, this preparation style where caregivers provide their children with at-home preparation under the direction of medical staffs having expertise in pediatric surgery and medical knowledge was considered to be the most appropriate and natural for Japanese preschool children and caregivers.

The purpose of the present study is to examine the effects of an at-home preparation program using audio-visual materials on the adjustment to surgery and hospitalization of Japanese preschool children who were scheduled to undergo elective herniorrhaphy and of their caregivers in a randomized controlled trial.

## 2. Methods

### 2.1. Participants

The subjects were selected from pediatric surgery outpatients who had been scheduled to undergo elective herniorrhaphy for inguinal hernia and hydrocele testis and their main caregivers at the surgery department in a large metropolitan children's hospital in Japan. The eligibility criteria were the following: preschool children between the ages of 3 and 6, who were identified and informed of being scheduled to undergo elective herniorrhaphy for inguinal hernia and hydrocele testis and their caregivers. Patients were excluded from participation if they or their caregivers had 1) chronic pain or suffering, 2) problems with any of the five senses (touch, taste, hearing, eyesight, and smell), 3) mental disorders or other disease that requires special treatments, 4) problems with communication or reading and writing in the Japanese language, or 5) stressful life event in the family in the past month.

### 2.2. Sample size

In the present study, the total target sample size was estimated to be 156 cases, which was based on the following anticipation: the type I error was $\alpha = 0.05$ (two-sided), the power was $1-\beta = 0.80$, the mean weighted effect size + 0.44 which indicates that the children in the experimental group changed less in a negative direction or more in a positive direction than the control group in the review most recently published as a meta-analysis, which had synthesized all known research that evaluated psychological interventions through the use of the PHBQ, by far the most commonly used method of examining post-hospital behavior [24].

### 2.3. Procedures

For inguinal hernia and hydrocele testis, patients underwent preoperative examination at the hospital a week before surgery. The contents of the study were then explained to the eligible subjects by the researcher. The researcher asked whether each subject agreed to participate in the present study and also asked the caregivers whether they or their child corresponded to any of the exclusion criteria. Caregivers then completed consent forms, based on the child's oral assent.

Subsequently, subjects who met the eligibility criteria were randomly assigned to either an experimental group or a control group by the results of each child's drawing of lots. All the medical staffs were blinded to assignment until the end of the study. And all the participants were given no information about complete contents of the two groups, the Hawthorne effect could be ruled out.

### 2.4. Study design

In the present study, the subjects were confined to preschool children between the ages of 3 and 6 undergoing elective herniorrhaphy for inguinal hernia and hydrocele testis because the preparation tools of video and booklet were designed to meet disease-specific and age-related psychological preparation.

Our hypothesis was that children who watch the video together with the help of the booklet as frequently as they want at home in a relaxed atmosphere (at-home preparation) would be better informed and prepared, and therefore exhibit less distress regarding surgery and hospitalization than those who watch the same video once at the outpatient clinic a week before surgery (outpatient preparation).

### 2.5. Measures

To demonstrate the effectiveness of at-home preparation using the video and booklet, the children's attitude toward surgery and the children's behavioral changes were each assessed. The demographic characteristics of the children and caregivers were also examined (Table 1).

The children's psychological distress at anesthesia induction was assessed by several medical staffs from the operating department who had no connection with the study using a behavioral assessment scale that consisted of 3 items of children's attitude: upset and cooperation items from Wolfer's Upset & Cooperation scale [27] and "emotional attitude" as an additional item. Emotional attitude was rated on a score of 1–4, ranging from "not crying or resisting at all" to "tearfully resisting so much that we had to restrain the child." Manifest upset attitude was rated on a score of 1–3, ranging from "not upset at all" to "extremely upset although the nurse tried to pacify." The cooperation attitudes were rated on a score of 1–3, ranging from "cooperative" to "extremely uncooperative and rejective." There was no difference in the way the anesthesiologists put the children under anesthesia between the two groups.

The children's post-hospital behavioral changes were assessed by the Post-hospital Behavior Questionnaire (PHBQ), by far the most commonly used method of examining posthospital behavior, designed to evaluate maladaptive behavioral responses and developmental regression in children following hospitalization or surgery [28]. The original version of this questionnaire consisted of 27 items dealing with behaviors identified as being characteristic of children after hospitalization or surgery e.g., temper tantrums, fear of the dark, and being upset when left alone. Caregivers were requested to consider each behavioral item, comparing their child's post-hospital behavior with that manifested before hospitalization. The five-point response scale ranged from the behavior occurring "much less than before" (scored 1) to "much more than before" (scored 5). The validity and reliability of the total score has been found to be satisfactory ($\alpha \geq .76$, $P < .001$). The PHBQ has been translated into Japanese and used in a research but has not yet been standardized [29]. Therefore the PHBQ was retranslated into proper Japanese and used in the present study after obtaining written approval from Vernon for the Japanese usage of the PHBQ. The reliability of the total score of the Japanese version of the PHBQ has been confirmed in this study ($\alpha = .76$). In the present study, data were collected after hospitalization from two groups at 1 week after surgery and 1 month after surgery.

Data on the demographic and clinical characteristics of the child (age, gender, order of birth, past medical history, history of present illness, experience of hospitalization, experience of surgery, diagnosis, resilience) and the caregiver's characteristics (relationship to the child, age) were obtained from the caregivers using a self-reported questionnaire.