Impact of Preoperative Psycho-Educational Program on Anxiety and Cooperation of Pediatric Patients

This study investigated whether providing a mediation program by the education staff prior to elective surgery would reduce anxiety, improve cooperation, and increase knowledge compared to children who did not receive a mediation program. Participants included 60 children (ages 5–16) prior to undergoing elective surgery under general anesthesia at Barzilai University Medical Center, Ashkelon, assigned to two groups: The control group received treatments provided exclusively by the medical and nursing staff. The experimental group also received mediation by the educational staff through a psycho-educational mediation program. Results were measured using the SCARED questionnaire in Hebrew with a section adapted to the study addressing anxiety, cooperation, knowledge acquisition, and one reflective question. Findings indicate that the experimental group's levels of knowledge and cooperation significantly exceeded that of the control group. In the psycho-educational program, 90 percent of experimental group participants exhibited a significant reduction in anxiety compared to the control group, persisting for two weeks following the intervention. The psycho-educational discussion was instrumental in helping most participants, particularly improving their emotional well-being. The staff's expertise in adapting the program to the children's emotional, physical, and mental needs also played a key role in reducing anxiety, increasing knowledge, and fostering cooperation.

Keywords: *anxiety, psycho-educational, surgery, pediatric, mediation program*

Introduction

Based on various assessments, approximately five million children in the United States undergo surgery each year (Wahid et al. 2022), while 50–70% experiencing severe anxiety and distress prior to the procedure (Finchler et al. 2012). Surgery can trigger a range of emotions for both children and their families, which may persist from the preoperative period through the surgery itself and even for several days afterward. These emotions can disrupt eating and sleeping patterns. Parental anxiety may further exacerbate or even trigger their child's anxiety. Preoperative anxiety is a key predictor for postoperative complications among children and is associated with undesirable outcomes, such as distress during recovery and regressive behavioral issues, such as nightmares, separation anxiety, eating disorders, and enuresis (Wahid et al. 2022, Perry et al. 2012).

Furthermore, children must often undergo surgery that is unexpectedly imposed on them, leading to heightened anxiety and confusion. This is compounded by hospitalization, where they find themselves in an unfamiliar environment while experiencing pain, sickness, and fatigue. At the same time, parents may struggle to accept the situation often feeling powerless, frightened,

and anxious about the outcomes of the illness and/or surgery. It is, therefore, understandable that children often experience uncertainty and a diminished sense of independence during illness and hospitalization. While medical and nursing staff do their best, within the available time, to alleviate anxiety and increase children's sense of control, children nevertheless may perceive these events as traumatic, potentially impacting their recovery and mental health in the short, medium, and long term (American Academy of Pediatrics 2014, Pinchover 2019). This underscores the crucial importance of preparing children for surgery.

The Shaked Barzilai Education Center is a facility that offers supplementary support to address the educational, emotional, and therapeutic needs of children hospitalized in the hospital's various departments. These services are provided for children from all sectors, regardless of religion, race, or sex (Barzilai University Medical Center Ashkelon 2024),**Error! Reference source not found.** in accordance with the Free Education for Sick Children Law (2001). It operates under the supervision the Ministry of Education, in collaboration with the Ashkelon Municipality's Education Department, the hospital administration, and the medical and nursing staff.

The center's staff includes therapists and special education teachers who specialize in providing a "the healthy world for the sick child," and are considered Certified Child Life Specialists (CCLS) (American Academy of Pediatrics 2014). These staff members initiate a psycho-educational dialog with the both the sick child and their family, helping them navigate the challenges of hospitalization, uncertainty, and pain, together with the experiences of illness and recovery. They also address aspects of the child's reintegration into the community.

The staff is well-versed in various therapeutic areas, including developmental theories, family inclusion in therapy, and support methods. They provide counselling and guidance to children, their families, and caretakers in the community, including in educational institutions. All these factors are handled with a deep understanding of the crises associated with illness, hospitalization, and the child's return to the community (Wahid et al. 2022).

The program for mediating medical procedures, developed by the Shaked Barzilai Education Center staff, welcomes patients upon hospitalization and accompanies them through their discharge. Utilizing content and various activities, the program mediates information and provides guidance, along with mental and emotional support. Its primary goal is to calm patients and their family attendants while helping them make sense of the hospitalization process in a way that prevents a traumatic experience in the future (Thomas 2009).

In Israel, various mediation programs have been developed that are tailored to children's conceptual understanding based on their age, sector, and language. These programs incorporate medical terminology and relevant medical equipment, following the guiding principle of transferring knowledge, experience, and practice (Ministry of Education 2024).The staff members undergo training to become CCLS**Error! Reference source not found.** (Association of Child Life Professionals 2024) through the Child Life Council

(CLC), an organization of educators and therapists specializing in program development. The CLC encourages sick children and their family members, equipping them with various skills to cope with illness, hospitalization, and the return to everyday life.

The preoperative preparatory program was developed based on the Shaked Barzilai Educational Center's philosophy, rooted in a holistic approach, serving as a foundation for educational work that simultaneously addresses physiological, emotional, and mental needs under one roof. To achieve this, Shaked Barzilai Educational Center employs various additional mediation programs based on a psycho-educational approach, including:

1. *Chess for Life*: A program that helps hospitalized child explore their available resources through play, music, and art.
2. *The Art of a Healthy Place*: A program based on famous artistic works as a means of expression and coping during the hospitalization and recovery process.
3. *Healthier than Ever Before*: A program based on classic games (pick-up sticks, cards, etc.) that helps children process their hospitalization experience.
4. *Feelings Bin*: A program designed to encourage emotional expression, providing children with tools to cope with the hospitalization process by developing and expressing awareness of their emotions and feelings.
5. *Book Journey*: A program that invites children to process their hospitalization experience through books and words.
6. *Doll Hospital* (under development): A therapeutic program focused on crafting therapeutic dolls.

It appears that data is absent from the literature regarding the impact of mediating medical procedures as implemented at our center and the significance of these programs for other hospitalized children and those in chronic day hospitalization. Therefore, the present study was conducted to investigate whether delivering the mediation program by educational staff prior to elective surgical procedures reduces anxiety, enhances self-confidence, improves cooperation and increases knowledge compared to children who do not receive the mediation program.

The objectives of the present study are as follows:

1. Emotional aspect: To examine changes in levels of anxiety;
2. Functional aspect: To assess changes in the degree of cooperation among hospitalized children;
3. Educational aspect: To evaluate changes in the acquisition of adapted information relevant to the medical procedure.

Materials and Methods

Sixty children scheduled for elective surgery with general anesthesia were randomly assigned to two groups: (1) A control group (30 children), which received standard mediation solely from the medical and nursing staff, as is the common practice in the department; and (2) an experimental group (30 children), which received mediation psycho-educational mediation by the educational staff through the program described above. Group assignment was randomized by coin flip. Participation was voluntary, with written consent obtained by one parent (or the legal guardian).

Inclusion criteria were children aged 5–16. Both the children and their parents completed a questionnaire upon hospital admission, before the procedure, and again after it. For children under age seven, parents completed the questionnaire; children aged seven and older completed it themselves in their native language. The selected questionnaire was based on the validated Hebrew version of the SCARED**Error! Reference source not found.** (Birmaher et al. 1997) questionnaire, with additional elements adapted to the present study. It assessed anxiety, cooperation, knowledge acquisition, and included one reflective question.

The questionnaire was sent digitally (via WhatsApp, SMS, or e-mail, based on family preference) two days before the elective procedure. Completion was guided by an educational staff member (L.Y.), a CCLS trained in the mediation program. Children who received the intervention attended a single two-hour session two days before surgery in a private, quiet room in the Barzilai Hospital's pediatric department.

The questionnaire was administered at three points: immediately before the operation (baseline), immediately after, and two weeks post-operation. The final questionnaire, administered when the children were at home and pain-free, aimed to capture their reflections after processing their pre- and post-surgery experience. This timing, sufficiently removed yet close enough to the procedure, was expected to yield different impressions (Fortier et al. 2010, Kain et al. 1999).

All interventions were delivered by a mediation program specialist (L.Y.). Demographic and medical data were collected from the children's medical records, including age, sex, medical history, family history, prior hospitalizations, regular medications, surgery details, and duration of hospital stay. The study spanned from June 6, 2022 to May 7, 2023.

Mediation Program Description

The medical psycho-educational program is a designed to prepare children for medical procedures and surgery. This modular program "greets" patients upon admission and supports them through discharge, mediating information and providing guidance, along with emotional, mental, and physiological support. Its primary goal is to calm patients and their accompanying family

members, helping them process hospitalization in a way that mitigates future trauma (Thomas 2009).

Developed in alignment with the research and development principles of the Ministry of Education, the program was designed by the Hadassah Hospital Education Center in Jerusalem. It is tailored to children's conceptual world, taking into account their age, cultural background, and language. The program incorporates relevant medical terminology and equipment, adhering to the principle of transferring knowledge, experience, and practice (Ministry of Education 2024).

Information is provided based on the assumption that knowledge is a tool that helps calm and cope emotionally in situations of stress and uncertainty. According to established cognitive restructuring therapeutic theories, providing information reduces the intensity of children's catastrophic imaginings (when they are explained what will happen to them and why). In parallel, the hospitalized children are taught various distraction and self-soothing techniques (Katsnelson 1993).

The mediation program is based on a psycho-pedagogical approach that applies awareness to emotions that arise and attitudes that develop within the reciprocal dynamics of teaching and learning processes. Typically, psycho-pedagogy identifies the mutual influence of the learning-teaching task and the emotional aspects experienced by both learner and teacher in these processes. Through the accompanying dialogue, it becomes possible—and essential—to address the student's emotional experiences and the emotional bond between the teacher and student, as well as foster feelings such as optimism, hope, and motivation (Zimmerman et al. 2014). In our mediation program, the psycho-pedagogic concept has been expanded to include dialogue that focuses on the sick student dealing with hospitalization; that is, psycho-pedagogic, psycho-educational dialogue.

The program includes several tools:

1. *Travel journal*. The journal is filled out by the children from the time of their arrival. It includes personal details, information about the procedure they will undergo, and which medical personnel they will meet. The journal entry is written following a detailed explanation by the CCLS about the roles of the various staff members and the nature of the upcoming procedure (a photo-album is provided for young children). This tool aims to provide children with a sense of control by helping them understand the steps of the hospitalization process while engaged in soothing activities. These activities help them draw on their inner strengths and resources, helping them cope more effectively with the medical procedure and physical pain. Employing this tool may prevent a negative experience. Dr. John Graham-Pole noted that the converse is true as well; when trauma, such as pain, is handled improperly, it can be etched in the child's memory as a negative experience that will shape their feelings towards their bodies, others, and medical treatment in general (Graham-Pole 2000).

The travel journal includes three interactive rulers developed by the Shaked Barzilai educational staff: a pain ruler, emotions ruler, and relaxation ruler. These tools address help the hospitalized children assess and articulate their pain and emotions through images from their internal world (animals, colors, weather, characters from movies and fairy tales, etc.). The relaxation ruler encourages sick children devise strategies to overcome their difficulties and harness their strengths for coping. A special version of the pain ruler was printed for use by nurses and doctors in the department for everyday use.

2. *Information Cards.* Age-appropriate information cards about the surgery that the child will undergo before entering the operation room and following the surgery. Tailored to three different age groups, the cards are designed with the understanding that knowledge can be a calming tool, helping patients manage situations of stress and uncertainty. By reducing the intensity of children's catastrophic imaginary thoughts, the cards facilitate coping while incorporating various techniques for self-soothing and distraction (Katsnelson 1993).
3. *Visual Aids.* These include surgical scrubs, anesthesia masks, intravenous tubes, and other aids relevant to the procedure. The goal is to familiarize the patient and their family members with the medical devices and equipment, allowing them to see and feel them before the procedure begins. Following this hands-on introduction, the patients participate in a creative activity incorporating these aids to further reduce anxiety (Thomas 2009).
4. *Photo Album.* As part of the presentation of theoretical information, visuals will be provided through a photo album that visually depicts what the child will undergo and see, including the children's ward and the route to the emergency room.
5. *Creative Activity.* After reading *Where the Worries Go at Night* (the Hebrew version of *Silly Billy* by Anthony Browne), a psycho-educational discussion is held to explore the children's concerns about the upcoming procedure. Afterward, the children create a "worry doll" (Brown 2008, 2006)[0] to hold their fears. Alternatively, they can make a picture using medical equipment, such as a syringe and tongue depressor**,** to help familiarize the children with the medical equipment they will encounter during their hospitalization to reduce their anxiety. All of the children in the intervention group participated in the psycho-educational program and received the five tools described above.

Statistical Analysis

The study required evaluating the impact of the medical intervention (the mediation program) on children's anxiety levels. To evaluate the program's effectiveness, we assessed the children's anxiety levels prior the intervention and two weeks afterward. This assessment was conducted using a paired-samples T-

test. Another test was performed on the control group who did not experience the intervention, and the comparison was made using an independent-samples T-test. We also examined whether there were differences in the children's knowledge about the procedure they were about to undergo and in their cooperation. For each of these areas, we referred to the children's feedback and compared it to the control group. The significance of the differences between the groups was analyzed using SAS statistical software.

Results

A total of 155 potential participants were identified between June 2022 and May 2023. Of these, only 67 participants met the inclusion criteria: ages 5–16, scheduled for elective surgery, and agreement to sign the informed consent form. Of the 67 eligible participants, seven withdrew for the following reasons: three declined surgery on the day of the procedure after receiving information from the anesthesiologist (two of whom were in the control group, which did not receive preoperative preparation). Another participant withdrew after her mother refused to complete the second questionnaire. One participant refused to undergo the preoperative blood tests at her local clinic, resulting in the cancellation of surgery. For the two remaining participants, surgery was postponed for more than six months.

Table 1 presents the demographic and medical characteristics of patients who participated in the study, including age, sex, and medical history.

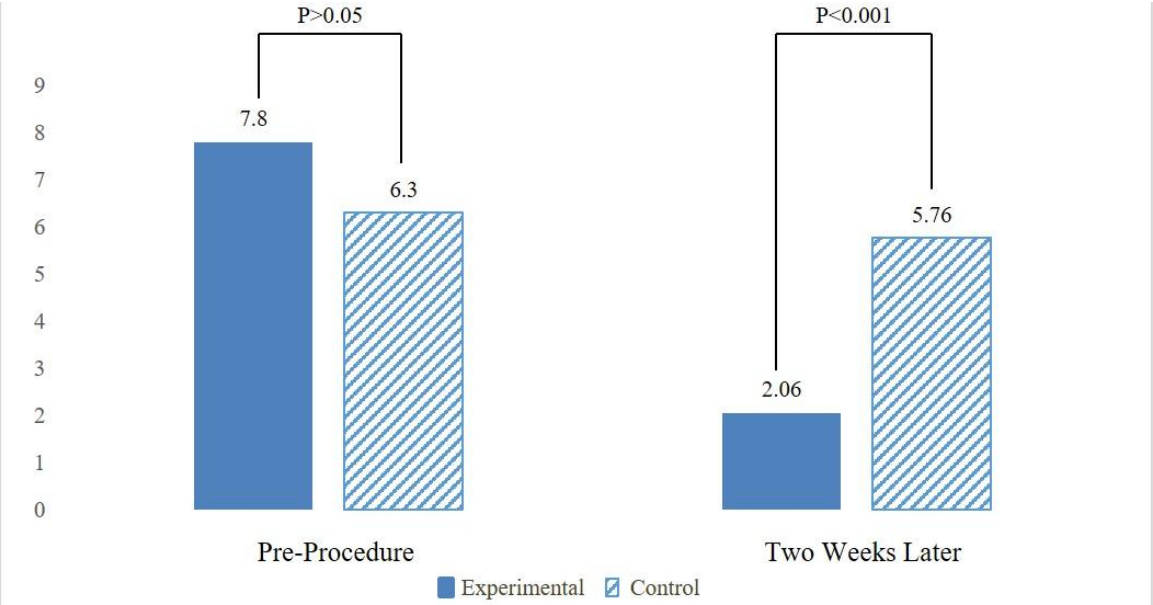
Table 1. *Study Participant Characteristics*

	Experimental Group	Control Group
Average age (years)	3.11±9.66	3.56±10.33
Sex: Male (%)	15 (50%)	19 (63.33%)
Female (%)	15 (50%)	11 (36.66%)
Prior surgeries	3	1
General surgery	5	5
ENT surgery	13	15
Orthopedic surgery	5	7
Plastic surgery	7	1

As shown in Figure 1, following the procedure, 27 students (90%) in the experimental group experienced a reduction in anxiety, while three students (10%) showed no change in anxiety levels at that time. None of the students experienced an increase in post-procedure anxiety. Two weeks after the procedure, of the 27 students who initially showed a reduction in anxiety, four (14%) experienced a slight increase in anxiety, which was not significant and remained within a low-anxiety range. For 18 students (66%), anxiety levels remained stable, with most of them reporting very low anxiety. The remaining five students (18%) continued to experience a decrease in anxiety. Two weeks

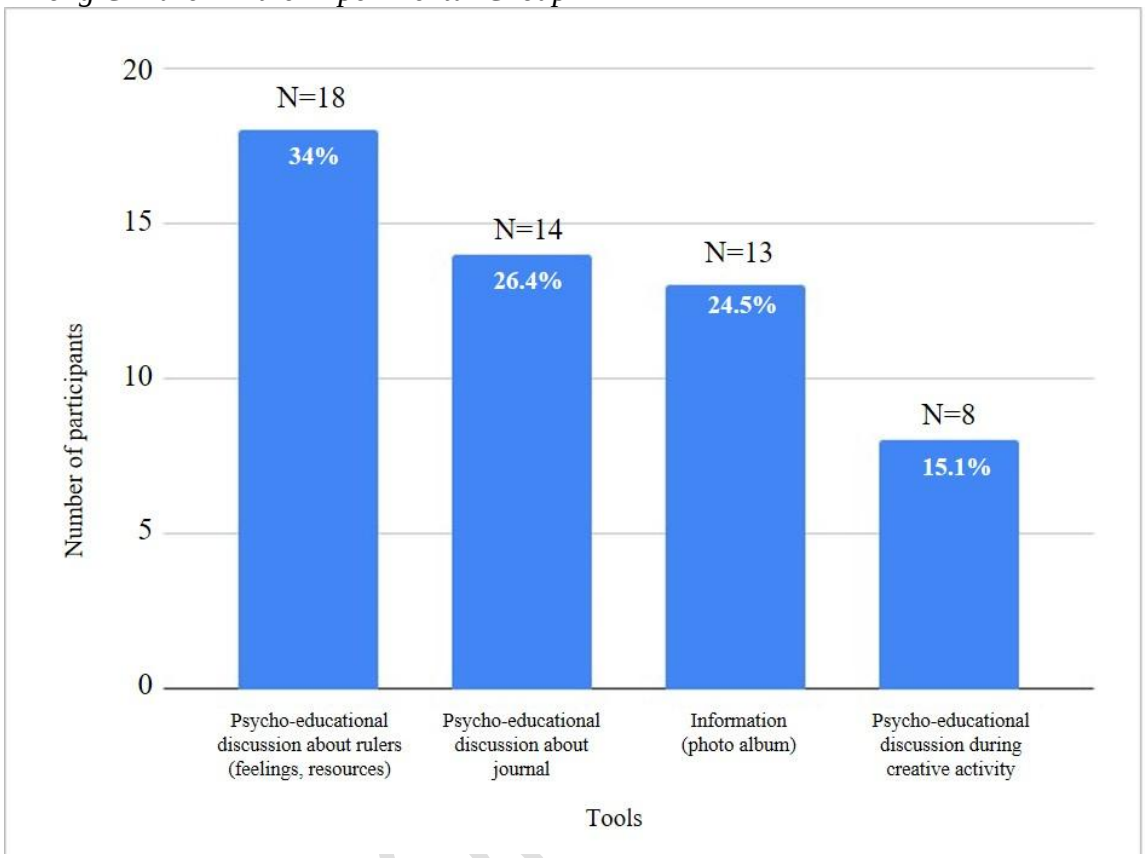
following the procedure, of the three students who did not experience a change in anxiety level before and after the procedure, two maintained low anxiety levels; the third showed a significant reduction in anxiety, dropping from 5 to 1.

Figure 1. *Anxiety Levels Among Experimental vs. Control Groups: Pre-Procedure and Two Weeks Post-Procedure.*



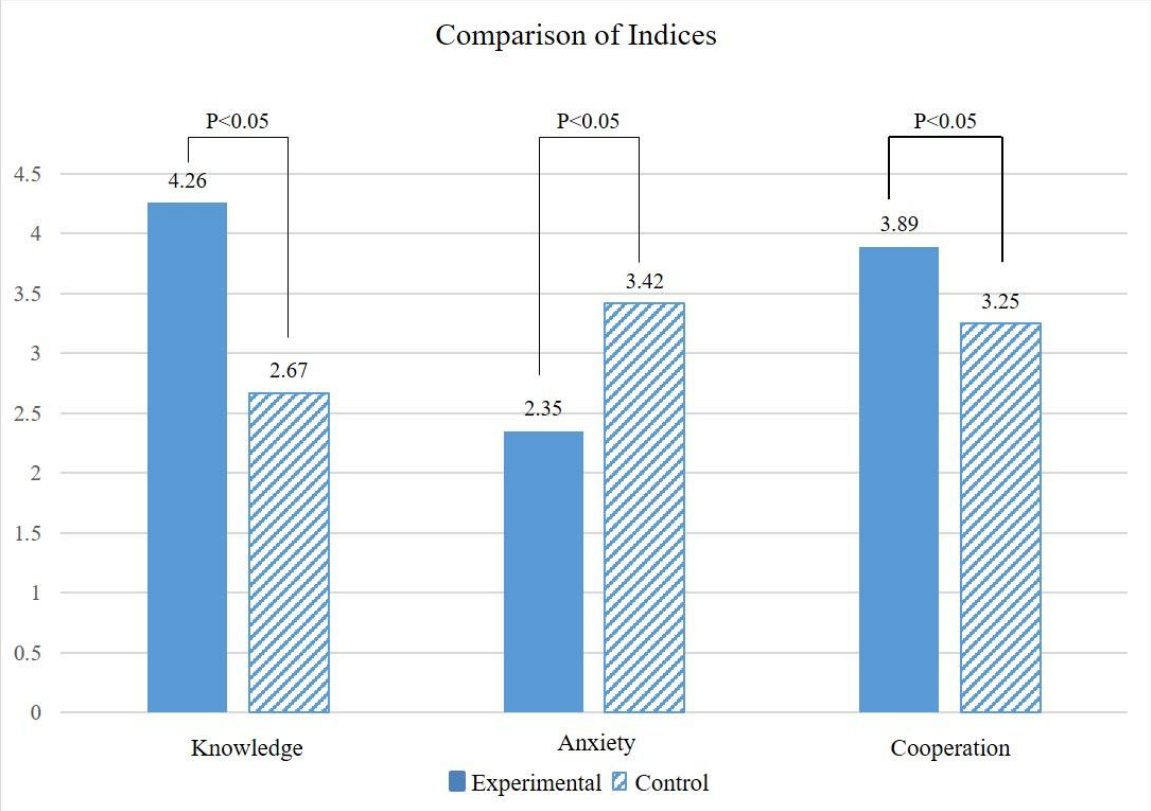
As shown in Figure 2, the percentage distribution of the participants' reports on the primary tool that influenced their anxiety levels and cooperation. The figure indicates that 18 children (34%) found that the psycho-educational discussion about the feelings and relaxation rulers, which focused on their resources, to be the most beneficial. Fourteen children (26.4%) identified the psycho-educational discussion in the journal context as most helpful. Thirteen children (24.5%) reported that the informative discussion (photo album) was most effective, while the remaining eight children (15.1%) reported that the psycho-educational discussion related to the creative activity helped them cope best with hospitalization and surgery.

Figure 2. *Constructive Qualitative Analysis of Tools Impacting Anxiety Reduction Among Children in the Experimental Group*



As shown in Figure 3, the graphs describe the average levels of the knowledge, anxiety, and cooperation in the experimental group compared to the control group. The data shows that the experimental group demonstrated significantly higher knowledge levels than the control group (4.26 vs. 2.67, $p<0.05$). Anxiety levels were lower in the experimental group than in the control group (2.35 vs. 3.42, $p<0.05$). Additionally, the experimental group exhibited higher levels of cooperation than the control group (3.89 vs. 3.25, $p<0.05$).

Figure 3. *Consolidated Results: Knowledge, Anxiety, and Cooperation in the Experimental Group vs. Control Group*



Discussion

Prior to surgery, children report experiencing various types of fear, including social fear, fear of animals, fear of death, fear of the unknown, and medical fear. In the context of hospitals, the most intense fears that children report include fear of separation from parents, hospitalization, blood tests, injections, fear of prolonged hospitalization and from "bad news" about their medical situation. In this category of fears can be added anxiety and fear of surgery (Hart and Bossert 1994).

In recent decades, hospitals in various countries have placed a significant emphasis on reducing anxiety in child undergoing surgery, particularly with regard to the fear of general anesthesia (Litke et al. 2012).0 There is broad consensus that an anxiety-inducing experiences for children facing surgery should be prevented to the greatest extent possible. Preventative methods include listening to calming music, playing with an iPad, watching videos, teaching coping skills, and involving parents (Wahid et al. 2022, Finchler et al. 2012, Hossari 2013, Kennedy and Howlin 2022). One study assessing the impact of providing knowledge (both verbal and written) about the medical procedure to both children and their parents on the day of surgery found a significant reduction in the child's level of anxiety before the procedure (Hartani and

Handayani 2021, Cumino et al. 2017).**Error! Reference source not found.** Furthermore, a review of empirical studies examining the most effective techniques for alleviating preoperative anxiety in children assessed the influence of parental presence both independently and in combination with an additional anxiety-reducing technique (Wahid et al. 2022). In light of this research, doctors favor non-medical interventions, particularly parental presence during the administration of anesthesia, to reduce children's anxiety. Routine techniques to mitigate preoperative anxiety include the use of various anxiety-reducing medications; however, these methods are costly and require additional nursing staff and beds in the operation room.1

The review and studies (Wiles 1988, 1987, 1979, Ratnapalan et al. 2009), along with the impressions of the medical staff at Barzilai Medical Center, found that children who participated in a two-hour preparatory program before the medical procedure exhibited less anxiety and were calmer before and during the procedure, as well as during their hospitalization afterward. In the present study we demonstrated that integrating psycho-educational dialogue with the five abovementioned tools significantly reduced anxiety levels in the experimental group, with 90% of the children (28 out of 30 children) showing some extent of reduction in anxiety. Moreover, this decreased level was maintained for two weeks following the intervention.

The present study assessed several components, including the impact of knowledge, cooperation, and anxiety levels. We found that, in addition to reducing anxiety, there was a significant increase in cooperation. Notably, when more information was delivered, this combination played a significant role in reducing anxiety.

This study is unique inasmuch as it highlights additional factors that can influence anxiety reduction, providing a basis for assessing the effectiveness of intervention programs. In response to the reflective question asked at the end of the process—"Which part of the program you participated in prior to surgery helped you cope best with the surgery?"—responses varied according to the children's ages. For example, five-year-olds had difficulty pinpointing what helped them most, aside for receiving attention and participating in the psycho-educational discussion. Six-year-olds noted that the psycho-educational discussion, facilitated by the mediator and focused particularly on information about the upcoming procedure, helped them most. In contrast, children aged 9–14 reported that psycho-educational discussion related to the relaxation ruler (resources) was most beneficial.

As previously mentioned, parental presence during the intervention was significant, but without their involvement. In our study, the ones completing the questionnaire were the children, in contrast to other studies, where parents or medical staff provided responses. This approach allowed for more precise answers directly from the children, reflecting their own perceptions, rather than through the mediation of parents or medical staff as they perceive the children.

Conclusions

This study highlights the critical importance of providing psycho-educational support to hospitalized children through medical mediation programs in general and pre-operative preparation in particular, while raising physicians' awareness of the significance of this support.

In the psycho-educational program described in our study, 90% of the children who participated in the intervention exhibited a significant reduction in anxiety compared to the control group, with this reduction persisting for up to two weeks following the procedure (see Figure 1). To date, no research in the literature has documented a comparable decline following psycho-educational discussions combined with the tools utilized in this study (a travel journal, interactive rulers, information cards, visual aids, creative activities, and a photo album; see Figure 2). Our findings indicate that not only is this method effective, but we can even isolate specific components of the program that are particularly effective in reducing anxiety in individual children.

We found that the experimental group exhibited significantly a higher level of knowledge compared to the control group (see Figure 3). From an educational perspective, imparting information also assisted in reducing anxiety (see Figure 2).

We extended the concept of psycho-pedagogical discussions by applying psycho-educational discussions during times of crises to help students cope with the hospitalization process. These discussions, especially when focused on emotions, significantly helped most participants reduce their overall anxiety, especially the emotional aspect. The skills and expertise of the staff in selecting and tailoring the content to the emotional, physical, and mental state of each child was found to be especially important.

All participants completed the questionnaires, in contrast to many studies were responses were filled out by the medical or nursing staff. This process ensured more accurate answers, reflecting the children's own perceptions rather than those of their parents or hospital personnel.

The present study is unique in its ability to maintain continuity in the children's levels of cooperation. The findings indicate that the cooperation levels of the experimental group were higher than those of the control group, even two weeks post-intervention. This was reflected in responses to the questionnaire, which asked participants if they would be willing to cooperate in future surgeries.

Children who participated in the intervention program not only experienced reduced anxiety and manifested higher levels of cooperation, but also acquired tools to help them cope with similar situations in the future. This was largely achieved through the awareness they developed using the resource and relaxation rulers, which may explain their high level of cooperation in future surgeries.

The type of surgery each child underwent did not affect their anxiety or cooperation levels during surgery. Differences by sex in terms of levels of

knowledge, anxiety, and cooperation were minimal. However, the study found that the intervention program had the greatest impact on older boys.

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