

# The Effects of Preoperative Recreational Activities on Children's Anxiety Level during the Perioperative Period

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**Abstract—Background:** Addressing and preventing anxiety preoperatively is crucial in understanding the consequences of preoperative anxiety and preventing unwanted outcomes after surgery.

**Purpose:** This study examined the effects of preoperative recreational activities on the level of anxiety in 2–7 year-old children during the perioperative period.

**Methodology:** A quasi-experimental design was used. A convenience sample of 60 children between 2 and 7 years of age who were scheduled for day surgery was recruited. Thirty children were randomly assigned to the intervention group, and thirty to the control group. Participants in the intervention group received a developmentally appropriate toy to play with preoperatively. Participants in the control group received the preoperative standard care. Anxiety was measured using the modified Yale Preoperative Anxiety Scale (modified YPAS) three times.

**Results:** Children in the intervention group exhibited a lower level of anxiety 15 minutes after the intervention (i.e., time 2) than those in the control group (mean =  $41.26 \pm 10.58$  vs.  $62.59 \pm 14.29$ ;  $p = .000$ ). A paired *t*-test revealed a statistically significant increase in the level of anxiety in the control group between baseline (T1) and 15 minutes after usual care (T2) ( $t = 5.44$ ;  $p = 0.00$ ). Playing with a developmentally appropriate toy is an effective non-pharmacological method to reduce anxiety levels

among 2–7 year-old children during the perioperative period in day surgery.

**Implication:** Study findings increase an awareness of introducing age-appropriate play as an essential component in preparing children for surgery to diminish the anxiety they experience.

**Callouts:**

1. Reducing perioperative child anxiety
2. Non-pharmacological anxiolytic strategies in preparing children for day surgery.
3. Using developmentally appropriate toys during the preoperative period.
4. Holistic and quality nursing care in preparing children for surgery
5. Introducing age-appropriate play as an essential component of to diminish the perioperative children's anxiety

**Keywords—**Preoperative; Anxiety; Recreational activities; Play; Children.

## I. INTRODUCTION

Children become afraid as a result of being separated from their parents, their home and school environment, and their family and friends. These children begin to imagine the pain that they may experience, in addition to the fear of the unknown and the loss of control (Dionigiet al., 2014). Furthermore, preoperative children see not

only unfamiliar faces wearing unfamiliar clothing, but also unfamiliar people holding unfamiliar surgical equipment, which provides an additional source of anxiety (Dionigiet al., 2014).

Preoperative anxiety is an extremely unpleasant sensation to children. Children's anxiety is characterized by feelings of tension, dread, nervousness, and uncertainty about their fate and ability to return home or go back to school. For example, Dreger and Trembeck(2006) have reported that more than 65% of children experience significant anxiety preoperatively. Understanding the cause of this preoperative anxiety in children is essential to addressing prevention and intervention strategies.

Preoperative anxiety can affect compliance with anesthesia induction (MacLaren &Kain, 2008). Young age and long waits could increase the need for preoperative sedation among children (Kim et al., 2012), which affects not only patient, but also system efficiency (MacLaren&Kain, 2008).

In addition to the mental stress that preoperative anxiety causes children to experience, anxiety has a negative impact on their recovery in terms of infections (Ahmad et al., 2011) and multiple behavioral problems (Cuzzocrea et al., 2013;Fortier et al., 2010),which include general anxiety, emergence delirium, nighttime crying, enuresis, separation anxiety, temper tantrums, insomnia, and eating disorders (McCann &Kain, 2001; Yuki &Daaboul, 2011). Indeed, up to 60% of children who undergo general anesthesia experience such behavioral changes postoperatively (Yuki &Daaboul, 2011).

Preoperative anxiety can delay healing, increase the risk of postoperative infection (Bailey, 2010) and exacerbate pain postoperatively (Bailey, 2010;Chieng, 2014),which in turn increases the need for analgesia. Addressing and preventing anxiety preoperatively is crucial in understanding the consequences of preoperative anxiety (Fincher et al., 2012) and preventing unwanted outcomes after surgery (Fortier et al., 2010).

Despite advances made in pharmacological and non-pharmacological preoperative anxiolysis interventions, the implementation of such measures is still minimal because of time and cost constraints (MacLaren &Kain, 2008). To overcome these constraints, many organizations, ironically, have adopted brief preoperative preparation programs that not only contain multiple components, but also involve considerable time and cost (MacLaren &Kain, 2008; St-Onge, 2012). This requires additional staff, which, in the face of a universal nursing shortage, is generally unattainable.

Non-pharmacological anxiolysis strategies, such as preoperative play activities, have been proven effective over pharmacological interventions (Golani et al., 2009;Lee et al., 2013; Vagnoliet al., 2005)and are recommended as a safe and cost-effective method of

anxiety prevention (McCann &Kain, 2001;Fortier et al., 2011;Mahmoudi-gharaei et al., 2008; Weber, 2010).

Studies have revealed that nonpharmacological anxiolysis interventions, such as play and recreational activities, are effective in reducing the anxiety level of children undergoing day surgery. For example, a preoperative preparation program based on therapeutic play with 7 and 12 year-old children in Iran was effective in reducing children's anxiety preoperatively (Vaezzadehet al., 2011). Moreover, Dionigiet al. (2014) have reported the effectiveness of a preparation program using a clown—the doctor performed preoperative assessments wearing a clown suit (i.e.,a colorful jump suit and smiley face makeup), and the children appeared calmer and happier with the clown doctor performing the preoperative assessment.

Preoperative preparation programs have been in existence for decades, and these programs cause ramifications to staff training, time, and costs (Chorny&Kain, 2010). Although preoperative preparation programs vary widely, most include one or more of the following interventions: modeling the desired behavior with a peer video, providing a surgical preoperative tour, teaching coping strategies, and using cartoons or puppets as therapeutic play (Fincher et al., 2012).

The efficiency of a standardized preoperative preparation program in minimizing the levels of anxiety experienced by children and their parents have been assessed via randomized clinical trial (RCT) in Australia. In this RCT, 73 children between 3 and 12 years old and their parents were randomized to either an intervention group (i.e., therapeutic play) or a control group (i.e., usual care) (Fincher et al., 2012).Results of the study demonstrate that the parents benefited more than their children from such a program; moreover, parents in the study group showed lower levels of anxiety than the parents in the control group, while children in the study group exhibited a lower level of pain postoperatively (Fincher et al., 2012). Meanwhile, a similar preoperative preparation program using therapeutic play in Iran with 7- to 12-year-old children was effective in reducing anxiety preoperatively (Vaezzadeh et al., 2011).

Within this context, Fortier et al. (2011)report that exposing children to the anesthesia mask at home and distracting them at the holding area are among the most effective interventions. Furthermore, MacLaren and Kain (2008) assert that the implementation of a brief preoperative behavioral preparation strategy (e.g., exposing the child to the anesthesia mask preoperatively) is a promising intervention that is both cost and time effective. Exposing the child to the anesthesia mask increases his or her compliance with anesthesia and decreases his or her anxiety significantly at the time of anesthesia induction, which is the most critical point of

the perioperative anxiety continuum (MacLaren & Kain, 2008). Likewise, providing the child with information and explanation about the interventions that will take place along the continuum of perioperative experience has also been shown to be effective (St-Onge, 2012). A comparative study in Sweden (Wennström *et al.*, 2011) examined the effectiveness of a perioperative dialogue (PD) intervention in which the child meets the same nurse, pre-, intra- and post-operatively, to reduce the level of anxiety in children between 5 and 11 years old. The following variables were measured: (1) salivary cortisol, (2) postoperative pain, and (3) the need for postoperative morphine (Wennström *et al.*, 2011). The PD participants demonstrated a statistically significant lower salivary cortisol level, which indicates a lower level of anxiety than that of the control group, which received standardized perioperative care (Wennström *et al.*, 2011). Although both groups in the study demonstrated the same level of pain, of the children who needed analgesia, those in the PD group needed and received less morphine (Fortier *et al.*, 2011).

**Humor as an intervention.** The use of humor has been examined as a behavioral intervention that might help to distract children, redirect their emotions, and help them to accept and understand the surgical environment, thereby minimizing their distress and enhancing their coping abilities (Martin *et al.*, 2011). An example of this is an intervention in which the child is accompanied to the preoperative room by a clown. Vagnoliet *al.* (2010) found this type of intervention effective in minimizing anxiety compared to a parental presence intervention. Similarly, Dionigiet *al.* (2014) have demonstrated the effectiveness of an intervention in which the doctor performs the preoperative assessment wearing a clown suit—the children felt calmer and happier as a result of this intervention.

Despite its effectiveness, the clown intervention, according to Scully (2012), is not always feasible to implement in perioperative environment because the presence of the clown may disturb the care giving process and increase the possibility of contamination. Additionally, many caregivers feel uncomfortable providing care wearing a clown suit (Scully, 2012).

The positive effect of engaging playful activities in playroom while waiting for surgery is also evident in Hosseinpour and Memarzadeh (2010), who demonstrate that children who played for half an hour before surgery with a developmentally appropriate toy or watched cartoons on TV in the playroom exhibited lower levels of anxiety than those children who waited for surgery without attending playing room prior to surgery.

Keeping pace with the technological advancement witnessed in the world today, Lee *et al.* (2013) evaluated the impact of playing with preferred smart phone

applications on children in the operation room prior to the anesthesia induction to minimize anxiety in Korea. The children showed a statistically significant, lower level of anxiety 5 minutes after the intervention among all three groups compared to their level of anxiety in the holding area (Lee *et al.*, 2013).

## II. METHODS

A quasi-experimental method was used to address our aims. Children between 2 and 7 years old were randomly assigned to one of two study groups, and we collected pre-test and post-test measures. The study was conducted at Queen Rania Hospital for Children in Amman, Jordan. This hospital was selected because it is the largest and most specialized children's hospital in Jordan. The hospital offers services to military personnel and their families as well as civilian citizens from Jordan, the region, and beyond. The day surgery department in Queen Rania Hospital features high-technology equipment and a diverse staff who are highly qualified (i.e., most of the nurses were bachelor degree holders who had received postgraduate training in pediatric nursing).

### Sample

After our study was approved by the ethical committee of the Royal Medical Services in Jordan, a convenience sample of 60 children between 2 and 7 years old was selected according to the following inclusion criteria: Jordanian child of either sex; undergoing elective outpatient surgery under general anesthesia; presenting with their parents; speaks and understands Arabic; exhibits normal growth and development; healthy and fit (i.e., Status I, according to the American Society of Anesthesiology [ASA] physical status classification) or presents mild systemic disease (i.e., Status II, according to the ASA physical status classification) (Daabiss, 2011).

Exclusion criteria were the following: non-Jordanian child; younger than 2 or older than 7 years of age; presenting with caregivers other than parents; does not speak or understand Arabic; developmentally delayed; does not meet the ASA Status I or Status II physical status classification; undergoing emergency surgery.

Children who met the inclusion criteria and underwent surgery at the day surgery unit at Queen Rania Hospital for Children in Amman were assigned to the intervention group or experimental group by using systemic random selection (30 children in each group).

### Data Collection

In the initial phase, an information sharing session was held with representatives from the day surgery department (i.e., the head nurse and the manager physician of the anesthesia department) to explain the purpose of study and the duties and responsibilities involved. For example, on the day of surgery, the children and their parents were to be met by the researcher in the outpatient unit. At that

time, demographic data (i.e., age, gender, and history of previous surgery) were collected, and written informed consent was obtained from the parents. During each week of data collection, eligible participants were alternatively assigned to either the intervention or the control group.

Based on the authors' experience in pediatrics, different scales were used to evaluate the anxiety levels of the children. To evaluate inter-rater reliability, trained nurses first were asked to evaluate the anxiety level of at least 10 children over a 3-day period. Then, the inter-rater reliability coefficient was calculated to confirm the agreement between the nurses' scores, which was expected to be 0.97. Following this, the adequacies of the instrument were assessed, the amount of time required to complete the assessment was recorded, and we determined whether or not the data could be analyzed as intended.

#### **Intervention Group**

To maintain the consistency of intervention, one researcher conducted the implementation of the intervention, with the assistance of a trained nurse for data collection. On the day of surgery, the children and their parents were seen at the outpatient unit. The baseline level of anxiety of the children in the intervention group was measured upon their arrival to the outpatient unit using the modified YPAS instrument. After the children were prepared for surgery, they were seen by the anesthesiologist to approve their eligibility for surgery. Accompanied by their parent(s), the children were offered a toy with which to play. The characteristics of the toys were developmentally appropriate for the age of the children, and the toys were selected by each child, depending on their interests. Moreover, consistent with the typical gender roles present in Jordan, toys such as cars and animals were offered to the male children to select from, and toys such as dolls and kitchen sets were offered to the female children.

At the time of toy selection, parental questions regarding the treatment process were answered. Not only ensuring to participants that the intervention will be delivered as intended, but also making the intervention as enjoyable as possible enhances treatment adherence, which, in turn, contribute to the validity of the outcomes, statistical analysis, and conclusions of the study (Polit & Beck, 2010). After 15 minutes of playing with the toys, another assessment of the anxiety levels of the children was conducted using the modified YPAS. Following this, the average of each measure for each child was calculated, each child was then transferred to the operating room, and he or she took the toy of his or her choice. The anxiety scale for the children was completed again in the operating room at the onset of anesthesia induction, and the average of level of anxiety was calculated.

#### **Control Group**

On the day of surgery, the children and their respective parents were met at the outpatient unit. Demographic data (i.e., age, gender, type of surgery, and history of previous surgery) were collected, and written informed consent was obtained from the parents. To ensure measurement objectivity, the researcher and the trained nurse—each one of them had an individual copy of modified YPAS scale—chose a different location to stand to observe a give child and measure his or her anxiety level. Following this, the average of each modified YPAS scale score for each child was calculated.

The baseline levels of anxiety for the children in the control group this group were measured upon their arrival to the unit using the modified YPAS. These children received the conventional hospital preoperative care and preparation (i.e., seen by the anesthesiologist to approve their eligibility for surgery and donning gowns), and their anxiety levels were measured again (1) 15 minutes after the conventional preparation and (2) at the time of anesthesia induction. Finally, the average of each measure for each child was calculated.

#### **Instrument**

The children's level of anxiety was assessed using the modified Yale Preoperative Anxiety Scale (YPAS) (Kainet *al.*, 1997). This scale is an observational instrument that (1) has been validated to measure the level of anxiety of children aged 2 years to 12 years during the perioperative period (Kainet *al.*, 1997) and (2) requires less than 1 minute to complete. The scale has exhibited not only good to excellent inter-observer reliability (weighted,  $k=0.68-0.86$ ), but also high construct and concurrent validity (Kainet *al.*, 1997). The modified YPAS also has demonstrated good reliability against the gold standard instrument (i.e., the State-Trait Anxiety Inventory for Children) (Kainet *al.*, 1997). Furthermore, in the healthcare context featured in this study, observational instruments are preferred over self-report measures for their time saving (i.e., modified YPAS requires less than 1 minute to complete), developmental appropriateness (i.e., young children who cannot communicate verbally because of their developmental level and particularly are vulnerable to preoperative anxiety can benefit from this instrument), sensitivity to changes in level of anxiety compared to global instruments (i.e., the modified YPAS is a structured instrument that consist of five domains of anxiety) (Kainet *al.*, 1997).

The sensitivity, specificity, and predictive values were calculated at different cutoff points on the modified YPAS scale. These calculations revealed that the cutoff point of 30 on the modified YPAS scale results in a balance for which the sensitivity and specificity are high, and the predictive value is 79% (Kainet *al.*, 1997).

Since its development, the modified YPAS instrument has been used widely to assess the effectiveness of various anxiety alleviating interventions for children undergoing surgery, and it consists of 22 items divided into five domains: activity, vocalization, emotional expressivity, state of apparent arousal, and the use parents (Kain *et al.*, 1997, MacLaren & Kain, 2008). The modified YPAS was repeatedly field tested until we established agreement about the types of observable behaviors that correspond to the scale points between the observers.

### III. RESULTS

#### Sample Characteristics

The participants comprised 60 children: 36 male (60%) and 24 female (40%), who displayed a mean age of (4.42±1.57 years). The participants were randomly assigned to the intervention group (i.e., n=30; mean age = 4.40±1.67) and the control group (i.e., n=30, mean age=4.43±1.48). Information about the participants in the control and intervention groups is shown in Table 1.

As shown in Table 2, our results reveal no statistically significant difference between mean age (p=0.695) and gender (p=0.598) between the two groups. Moreover, both groups exhibited no statistically significant differences in relation to previous surgical history (p=0.297).

The independent t-test comparison revealed statistically significant (p= 0.005) differences between the two groups at the time of a child's arrival to the day-surgery department (i.e., time 1). The mean level of anxiety for the intervention group (i.e., 59.66±9.76) was higher than the mean level of anxiety for the control group (i.e., 48.1±19.03).

Moreover, our results reveal that the intervention group had a lower anxiety level after the introduction of the intervention, at time 2, compared to that of the control group (i.e., mean= 41.26±10.58 vs. 62.59±14.29; p = .000).

As shown in Table 3, the highest mean for the anxiety score in the intervention group occurred at the time of anesthesia induction (i.e., time 3) for both groups. However, the independent t-test revealed that the mean anxiety score was lower, in a statistically significant fashion, than that of the control group at the same time point (i.e., mean=63.07±14; mean= 83.7±10.3 for both groups, respectively, p=0.00). The intervention group exhibited the lowest level of mean anxiety at the second time point of measurement (i.e., after implementation of the intervention), and mean anxiety score was lower, in a statistically significant fashion, than that of the control group at the same point of time (41.23 ±10.58 vs. 62.56±14.29, p<0.00) (see Table 3).

Using a paired t-test, the differences in anxiety level were compared for each group independently. We observed a

statistically significant incremental increase in the level of anxiety within the control group after baseline measurement until 15 minutes after the conventional preparation (t= 5.44; p =0.00). In contrast, the intervention group exhibited a statistically significant decline in the level of anxiety 15 minutes after playing with a toy compared to the mean score upon a child's arrival (t= 10.20; p =0.00) to the unit. However, in both groups, the level of anxiety was the highest at the time of anesthesia induction (i.e., time 3). The level of anxiety was higher, in a statistically significant fashion, at the second time point for both control and intervention group (p = 0.000; p =0.00), respectively. See Table 4 and Table 5.

### IV. DISCUSSION

In this quasi-experimental study, we (1) examined the effect of preoperative recreational activities on the level of anxiety of children aged 2–7 years during the perioperative period and (2) measured the difference in the level of perioperative anxiety between the children who received preoperative recreational activities and those who didn't. The need for cost- and time-effective measures to minimize the level of anxiety in children in this healthcare context cannot be over emphasized—this anxiety has been well documented in the literature for decades (Chorny & Kain, 2010; Fincher *et al.*, 2012; Fortier *et al.*, 2010; St-Onge, 2012). Our study built on the substantial amount of evidence concerning the effectiveness of non-pharmacological anxiety reduction measures before surgery.

Our results generally support those of previous studies. For example, the children in our intervention group exhibited lower levels of anxiety fifteen minutes after playing with developmentally appropriate toys preoperatively than those in the control group who did not. This finding supports the findings reported by Weber (2010): children who played in the recreation room exhibited significantly lower level of anxiety than those who did not 15 minutes after the activity. Similarly, Gao *et al.* (2014) has reported that children who played an interesting game while waiting for an operation experienced lower levels of anxiety than those who waited with no game playing. Findings of this sort correspond with similar studies that have investigated the effect of playful activities before surgery on children's levels of anxiety (Ghabeliet *al.*, 2014; Hosseinpour & Memarzadeh, 2010; Mahmoudi-gharaei *et al.*, 2008).

Given that our intervention group exhibited a higher anxiety level than the control group at the baseline measure (i.e., mean=59.66±9.76 vs. mean=48.07±19.03; p =.0005, respectively), the subsequent decline in the intervention group anxiety level, even with its higher anxiety level at baseline (i.e., mean= 41.26±10.58 vs.

62.59±14.29;  $p = .000$ ), provides evidence of the efficacy of our intervention.

Children usually perceive the event of surgery as threat to their well-being (Lazarus & Folkman, 1984). The unfamiliar environment that comprises not only strange faces, clothes, and equipment, but also unusual routines gives children a sense that they lack control over the situation (Dionigiet *al.*, 2014), which is reflected in their negative emotions of anxiety, fear, and anger upon arrival to the unit (Lazarus & Folkman, 1984).

The results of our study can be interpreted in this way: the children could do nothing about the situation in which they found themselves, yet some slight modification of the environment, such as a toy could help their emotional well-being during the perioperative period. As where Lazarus and Folkman (1984) introduced an emotional, focused approach for coping, our intervention of providing the child the opportunity to choose between various developmentally appropriate toys, in contrast, attempted to help the children in controlling their environment so that they could appraise the situation of surgery as non-threatening or at least less threatening to their well-being. Moreover, an intervention of this kind may direct the child toward a problem-focused approach of coping through the adjustment of the environment causing distress (Lazarus & Folkman, 1984). In other words, with the presence of toys, the preoperative department was transformed from a purely technical and cold environment to a more familiar one. This, in turn, enabled the children to gain some sense of control over the situation, which might explain the diminished level of anxiety of those children who were in the intervention group in relation to those in the control group 15 minutes after the intervention.

Lazarus and Folkman (1984) reported that the availability of resources, which mediate the stress affect, enhance, to a great extent, an individual's ability to cope. Nonetheless, the results of other studies (Ghabeliet *al.*, 2014; Hosseinpour & Memarzadeh, 2010; Mahmoudi-gharaeiet *al.*, 2008) have revealed that children can build only a limited amount on their internal resources because of their physical and psychological immaturity. Instead, children primarily depend on external resources (e.g., parental presence and modification of the environment) to cope with stressful situations (e.g., surgery) by providing more control over the situation (Ghabeliet *al.*, 2014; Hosseinpour & Memarzadeh, 2010; Mahmoudi-gharaeiet *al.*, 2008).

Preoperative waiting period is a factor that may increase the anxiety level and distress of children. Therefore, offering children a toy seems to help distract and redirect their emotions to manage the waiting time before surgery. For example, Martin *et al.* (2011) found that the use of humor and play activities can function to distract a child

facing surgery (i.e., to redirect emotions and to help them accept and understand the unfamiliar surgical environment), thereby minimizing distress and enhancing their abilities to cope (Martin *et al.*, 2011).

High-level threats impede an individual from using coping strategies effectively (Lazarus & Folkman, 1984), and surgery—and the environment of surgery—poses a major threat to children. Therefore, targeting the environment in the preparation of our intervention may have contributed to minimizing the anxiety level of the child participants by enhancing their ability to cope. Similarly, in a study that involved decorating the anesthesia induction room toys and colors attractive to children, Gao *et al.* (2014) report a reduction in environment-related stress and stimulation, which, in turn, reduced the anxiety levels of the participants.

However, the increase in the level of anxiety among children at the time of anesthesia induction in the intervention group supports the notion that coping does not mean having mastery over the situation (Lazarus & Folkman, 1984). Surgery for children is among the situations that cannot be mastered. Nevertheless, considering the fact that the children who played with toy had a significant lower anxiety level than those who did not, coping in this situation meant minimizing an event that cannot be actually mastered (Lazarus & Folkman, 1984). The increase of anxiety at the time of anesthesia induction in both groups suggests that this point of time is the most stressful along the continuum of surgery (Kainet *al.*, 2007; MacLaren & Kain, 2008).

In the studies we reviewed as part of this research, with the exception of one (i.e., Gao *et al.*, 2014), the impact of play activities was not investigated at the time of anesthesia induction. This impact primarily was evaluated either in the operation room or postoperatively. In contrast, other studies (Lee *et al.*, 2013; Mahmoudi-gharaeiet *al.*, 2008) have evaluated the impact only after the intervention. For example, Gao *et al.* (2014) investigated the impact of interesting games on the children's level of anxiety at the time of anesthesia induction. Parallel to our results, Gao *et al.* (2014) report a statistically significant difference in the anxiety level between the intervention and control group at the time of anesthesia induction. Gao *et al.* (2014) explained this increment by emphasizing that the anesthesia induction mask is a great source of surgery-related anxiety that cannot be overcome by the children, even in a child-friendly environment.

Furthermore, in a study that evaluated the impact of preoperative play with developmentally appropriate smart phone applications, Lee *et al.* (2013) report results that display the same trends in anxiety level as our study. According to Lee *et al.* (2013), the children who played with the smart phone application had a dampened level of

anxiety 10 minutes after the application of intervention; however, the dampened level of anxiety increased in the operation room, which supports the notion that the operating room and the anesthesia mask presents a great source for anxiety for children. Similarly, Mahmoudi-gharaeet *al.* (2008) demonstrate that preoperative toy play could be responsible for the dampened level of anxiety increment that extended postoperatively; therefore, the children who played with a toy before surgery also exhibited lower levels of anxiety postoperatively compared to those who did not play with toys. However, this result raises a question about the factors that might contribute to the rise of a child's anxiety at that point of time.

In the current literature, many factors have been found to affect the preoperative child's anxiety level, which include the following: the developmental level of the child (Ayaz &Varlik, 2012),temperament, previous medical experience, the child's level of attachment with the parent, and the child's biological vulnerability (Ahmadet *al.*, 2011).Indeed, Lazarus and Folkman (1984)have asserted as part of their theory of stress appraisal and coping that past experience, personality factors, and perceptions about the stressful event are among the factors that likely affect an individual's appraisal of a perceived threat.

In our study, an increasing level of anxiety could be attributed in part to (1) the children's separation from their caregiver—particularly for those aged 2–3 years old and (2) the fear of surgery for older children aged 4–7 years old (Lee *et al.*, 2013).Previous surgical history, particularly a negative experience with anesthesia, might be responsible for this increasing at the time of entering the operating room. Additionally, the introduction of the anesthesia mask in the operating room certainly seems to be a source of stress that increases the level of anxiety level—even with the option for environmental modification (Gao *et al.*, 2014).

Another source of stress could be the long waiting period and prolonged fasting hours before surgery (Weber, 2010).However, because the anesthesiologists in Queen Rania Hospital for Children in Amman subscribe to a conservative approach, they did not apply the latest recommendations of the ASA (ASA, 2011), which allow clear liquids 2 hours before surgery; therefore, any anxiety and distress experienced by the children from being deprived of fluids for the prolonged period before surgery could be diminished. Nonetheless, the preoperative department does routinely allow breast milk and clear fluids 6 hours before surgery because the anesthesiologists believe that some parents will not comply with their instructions.

## Limitations

In subsequent studies of this topic, larger random samples of participants and a larger selection of gender neutral toys should be considered. Moreover, the use of single-blinding approach in subsequent studies in which the data collectors are blinded from the treatment allocation of the study groups would likely enhance the validity of the study. Moreover, we strove for intervention fidelity through our strict adherence to the written intervention plan.

## V. CONCLUSIONS AND IMPLICATIONS

The results of this study reveal that children, who played with a developmentally appropriate toy before surgery exhibited a statistically significant, lower level of anxiety than those who did not, both 15 minutes after the intervention and at the time of anesthesia induction.

This study's most valuable implications for nursing practice are related to its determination of the clinical effectiveness of a play intervention in preparing children for day surgery. Moreover, this study reveals the appropriateness of using a play intervention to prepare children for surgery preoperatively in Jordanian culture. The findings from this study will promote awareness in nurses and parents that play is a very important part of children's lives—not only when they are well, but also when they are ill. Additionally, the results of this study will also increase an awareness of the importance of introducing age-appropriate play as an essential component of holistic and quality nursing care in preparing children for surgery to diminish the anxiety they experience. Furthermore, this study, which used brief and simple recreational activities preoperatively, reveals that a play intervention can be designed to overcome time and cost constraints as well as staff shortages.

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Table.1: Description of Participants for Both Groups (N =60)

		Control Group (n = 30)	Intervention Group (n = 30)
Gender	Male	19	17
	Female	11	13
Surgical History	Yes	11	15
	No	19	15
Age	Mean	4.43	4.40
	S.D.	1.48	1.67

Table.2: Distribution of Selected Variables (i.e., Gender, Previous Surgical History, and Age) of the Two Groups (N =60)

	Gender	History	Age
X2	.278	1.086	3.035
df	1	1	5
P	.598	.297	.695

Table.3: Anxiety Level Differences Throughout Three Times Between Control and Intervention Groups (N =60)

	Control Group (n= 30)		Intervention Group (n=30)		P
	Mean	SD	Mean	SD	
Time 1	48.07	19.03	59.66	9.76	.005
Time 2	62.59	14.29	41.26	10.58	.000
Time 3	83.68	10.30	63.07	14.01	.000

Note. \*Time 1 = child’s arrival to surgery department; \*Time 2 = after usual care (control group) and after playing with toy (intervention group); \*Time 3 = at the time of anesthesia induction.

Table.4: Comparison of Paired Differences for Control and Intervention Groups (N =60)

Groups		N	df	t	P
Control Group	Pair 1 time1–time 2	30	29	5.44	.000
	Pair 2 time2–time3	30	29	8.98	.000
Intervention Group	Pair 1 time1–time2	30	29	10.20	.000
	Pair 2 time2–time3	30	29	6.77	.000

Note. \*Time 1 = on child's arrival to day-surgery department; \*Time 2 = after conventional care (control group) and after play of toy (intervention group); \*Time 3 = at the time of anesthesia induction.

Table.5: Comparison of Paired Differences in Mean of Anxiety Level for Control and Intervention Groups (N =60)

		Control Group		Intervention Group	
		Mean	SD	Mean	SD
Pair 1	Time1	48.07	19.03	59.66	9.76
	Time2	62.56	14.29	41.26	10.58
Pair 2	Time2	62.56	14.29	41.26	10.58
	Time3	83.68	10.30	63.07	14.01