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The Effect of Directed Medical Play on Young Children's Pain and Distress during Burn Wound Care

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Abstract

Directed medical play is used to reduce children's pain and distress during medical treatment. In this pilot study, young children who attended the burn clinic received either directed medical play provided by a child life specialist or standard preparation from the burn clinic nurse, to prepare for their first dressing change. Data were collected using validated instruments.

Children who participated in medical play experienced less distress during their dressing change ($M = 0.5$, $n = 12$) than those receiving standard preparation ($M = 2.0$, $n = 9$). Children who received standard care reported a 2 point increase in pain during the procedure whereas children who participated in medical play reported a 1 point increase. Change in parental anxiety was similar for both groups. Parent satisfaction was higher for caregivers who observed medical play than standard preparation. Although all findings were in the hypothesized direction, none were statically significant, most likely because of the small sample size.

Keywords

Medical Play; procedural distress; young children; pediatrics

Introduction

Children with burn injuries are likely to face multiple painful procedures throughout the course of medical treatment. Children may display outward negative reactions to medical procedures (Burnstein & Meichenbaum, 1979; Lumley, Melamed, & Abeles, 1993). The discomfort and distress associated with painful medical procedures has demonstrated long-term negative effects for patients and their caregivers, including eating and sleeping disturbances, decreased cooperative behavior, increased fears, and post-traumatic stress (De Young, Hendrikz, Kenardy, Cobham, & Kimble, 2014; LaMontagne, Wells, Hepworth, Johnson, & Manes, 1999; Lynch, 1994; Roberts, Wurtele, Boone, Ginther, & Elkins, 1981; Tiedeman, 1997). Therefore, strategies designed to reduce the pain and distress associated with burn wound care procedures should be considered as a means of improving the overall experience for children and their caregivers.

When investigating a child's distress during burn wound care procedures, the caregiver's emotional state is important to consider. For example, parents/guardians of pediatric burn patients have been shown to exhibit significantly higher levels of anxiety and depression than the general population (Phillips & Rumsey, 2008), with as many as 69% showing levels of anxiety outside of normal boundaries. There is a body of research providing evidence to support the idea that a caregiver can impact the distress and pain responses of a child (George & Hancock, 1993; Blount et al., 1989; Bush, Melamed, Sheras, & Greenbaum, 1986; Koller, 2008; Spagrud et al., 2008; Wolfer & Visintainer, 1975). Therefore, understanding the role of medical play as potentially mitigating parental distress is an important consideration. The positive impact of medical play on the pediatric patient could directly affect parental anxiety and satisfaction with the care received, as well as facilitate greater understanding of the specifics of the procedure. Information of this kind could foster greater parental self-confidence in support of their child during the wound care procedure, decrease anxiety, and promote a more positive experience. Based on the evidence, it is plausible that lowering parental anxiety could then lower child distress and anxiety (Chambers, Craig, & Bennett, 2002).

A large body of research on the construct of psychological preparation has shown that some form of information provided to children and teens prior to a medical experience can have positive outcomes on the child or teen's anxiety and distress. Three components of psychological preparation that have been identified as essential to effective interventions include: (1) providing developmentally appropriate information, (2) opportunities for emotional expression, and (3) establishing trust with the pediatric health care team (Felder-Puig et al., 2003; Hatava, Olsson, & Lagerkranser, 2000; Thompson, 2009; Wolfer & Visintainer, 1975).

Directed medical play incorporates many of the basic elements of preparation and further provides the opportunity to examine and manipulate medical equipment, process procedural information, and gain mastery, all in a playful, non-threatening environment (Gaynard et al., 1998; Webb, 1995). To be clear, the construct of medical play is described utilizing terms such as therapeutic play, role play with medical equipment, healthcare play and even a literal description of play with medical themes and/or equipment in the literature. For the

purpose of this study, the term “directed medical play” refers to a play activity with children involving the use of actual or toy medical equipment in playful, pretend, exploratory, and educational ways with the presence of a supportive, knowledgeable adult.

Child life specialists use expertise in child development to assess the needs of children in healthcare settings and provide interventions to prevent and decrease the negative impact of the novel and/or stressful healthcare events on a child's development (Koller, 2008). In fact, as child life practice is more thoroughly examined in the literature, the therapeutic presence of child life specialists has been demonstrated to be valuable (Smith, Murray, & McBride, 2011). Using play as a primary tool, child life specialists practice with three major goals:

- to build therapeutic, supportive relationships with children and their families
- provide consistent play opportunities to normalize the environment and
- provide education about the healthcare environment through the use of developmentally appropriate language and preparation tools.

Thus, this study focused on directed medical play delivered by child life specialists.

Literature Review

Search Strategy

A detailed search was performed using the following databases: CINAHL (EBSCOhost), PubMed (NCBI, US National Library of Medicine), and Medline (OvidSP, Wolters Kluwer). The search strategy used the combination of 2 search terms: (1) “play and playthings,” “play therapy,” “medical play,” “therapeutic play,” “play,” “pain,” “anxiety,” “child,” “preschool,” and (2) “child life,” “play specialist” and “burns.”

To obtain all relevant studies, no date limitations were set in any of the searches. Included studies were full text articles, published in English and peer reviewed.

Study Selection Process

The combination of terms from groups 1 and 2 yielded 19 studies. These studies were specifically reviewed in relation to the use of medical play or therapeutic play to reduce anxiety, distress or pain in children during medical procedures. Eight articles were removed because they were case studies, qualitative in nature or literature reviews. An additional seven were removed because they did not meet inclusion criteria. This left four studies from the systematic search, to include with the five studies the research team and other content experts had identified. In total, nine studies were found to provide relevant empirical evidence about the use of therapeutic play in healthcare settings.

Study Designs and Subjects

Of the nine studies identified, four were quasi-experimental in design (Bloch & Toker, 2008; Brewer, Gleditsch, Syblik, Tietjens, & Vacik, 2006; Hatava et al., 2000; Zahr, 1998) and five were randomized controlled trials (Burns-Nader, Hernandez-Reif, & Thoma, 2013; Li, Lopez, & Lee, 2007; Li & Lopez, 2008; Wee, Chan, Cheung Li & Hong-Gu, 2014; Wolfer & Visintainer, 1975).

The children who participated in all of the studies were between the ages of 2 and 12 years, with only two of the studies including children as old as 12 years (Li et al., 2007; Li & Lopez, 2008). The studies were culturally diverse with children from North America (Wolfer & Visintainer, 1975; Burns-Nader et al., 2013; Brewer et al., 2006), Israel (Bloch & Toker, 2008), Lebanon (Zahr, 1998), Sweden (Hatava et al., 2000), Singapore (Wee et al., 2014) and Hong Kong (Li et al., 2007; Li & Lopez, 2008) enrolled.

Medical Play Procedures

The specific intervention of directed medical play was implemented in several ways in the studies. Six studies utilized directed medical play provided by nurses, physicians and/or the researchers whose backgrounds were in medicine, as a tool for preparation for upcoming surgical procedures (Hatava et al., 2000; Li et al., 2007; Li & Lopez, 2008, Wee et al., 2014; Wolfer & Visintainer, 1975; Zahr, 1998). In three studies (Hatava et al., 2000; Li et al., 2007; Li & Lopez, 2008), directed play took place in a group setting of 5 to 6 children in the operating room several days before surgery. The equipment involved in anesthesia induction (such as a blood pressure cuff, pulse oximeter, IV tubing, EKG electrodes and anesthesia face mask) were demonstrated by a nurse and children had the opportunity to role play the procedures with a doll. In the Wolfer & Visintainer (1975) study, children were given accurate information about surgery including the sequence of events, sensory information, child role expectations and appropriate responses along with previews of procedures using play techniques. Children were provided with therapeutic play in the form of an interactive puppet show pertaining to the surgery in the Zahr (1998) study.

Two of the studies used some form of medical play (directed and one non-directed) provided by child life specialists (Brewer et al., 2006; Burns-Nader et al., 2013). The Burns-Nader, Hernandez-Reif, and Thoma (2013) study contained four activities occurring in a pediatrician's office: non-directed medical play, a medical information video consisting of a taped play session, diversionary play using a board game and a control safari video. Children (5.5 to 12 years old) were randomly assigned to one of these activities.

The Bloch and Toker (2008) study was different from the other studies reviewed in that it provided directed medical play in a "teddy bear hospital." This half day intervention was conducted in a play hospital setting with medical students as the "physicians." The children selected a "diagnosis" for their self-identified toy (a doll or teddy bear). The medical students conducted a physical examination on their toy and the children were encouraged to perform exam procedures. Although the children in this study were not currently hospitalized, all research related observations took place at a medical center, in a central courtyard setting. The study specifically measured a child's self-reported anxiety, on a visual analog scale, towards a potential hospital admission both before and after directed medical play.

Findings in the Included Studies

State anxiety of children was the most common outcome measured. In fact, those that measured anxiety found that it decreased significantly in the groups provided with some form of therapeutic play with a medical theme (Bloch & Toker, 2008; Brewer et al., 2006;

Li et al., 2007; Li & Lopez, 2008). Wolfer and Visintainer (1975) found that children and parents in the intervention group showed significantly less upset behavior, more cooperation and fewer negative post-hospital adjustment behaviors than those in the control group. Zahr (1998) and Wee, Chan, Cheung Li & Hong-Gu (2014) also reported the findings of fewer negative post-hospital upset behaviors.

Three of the studies examined children's responses at time of anesthesia induction and found that those who received some form of directed medical play as a part of preoperative preparation were calmer and had fewer negative responses surrounding anesthetic events (Hatava et al., 2000; Li et al., 2007; Wee et al., 2014; Zahr, 1998). The study by Burns-Nader et al. (2013), however, had conflicting findings in that the children who received non-directed medical play had more difficult behaviors and lower moods at a pediatrician's visit than did those who watched a video or engaged in activities unrelated to the medical setting.

Two studies found that physiological responses of children, including decreased blood pressure and pulse rates, shorter time to first void and ease of fluid intake post-operatively, were all significantly better in children who received the intervention involving medical play (Wolfer & Visintainer, 1975; Zahr, 1998). Li, Lopez and Lee (2007) and Wee et al. (2014) also measured post-operative pain and found that children in the experimental group had lower levels of post-operative pain, but these results were not statistically significant. None of the other studies measured pain outcomes.

Also examined in two of the studies were parental anxiety and satisfaction with the information and care provided. Parents in the intervention groups reported significantly lower anxiety when either observing the preparation and medical play provided to their children or directly receiving information themselves (Li & Lopez, 2008; Wolfer & Visintainer, 1975).

Across these studies, findings on child behavior and physiology were consistently in favor of medical play, with the exception of one. The Burns-Nader et al. (2013) study was different in that it utilized a non-directed medical play group. Children in the medical play group exhibited more distress behaviors than those in the other three groups during nurse triage procedures. Perhaps play needs to be directed, where procedures are performed on a doll in the same manner and sequence that they will be conducted on the child, to decrease their distress. Unstructured play, where the child explores the equipment that interests them, may not be as effective in reducing anxiety pre-procedurally or for this age group.

Gaps in Current Research

The selected papers were all relevant to the current study, however, this study attempts to begin filling some important gaps in the research literature. First, only two of the studies measured pain as an outcome. Pain is one of the primary outcomes measured in this study. Also, the body of evidence, though mostly consistent in its findings, is still relatively small on the use of directed medical play and its impact on young children in health care settings. In addition, only one of the studies utilized child life specialists in providing directed medical play and preparation (Brewer et al., 2006). While nurses are able to incorporate play and preparation into care, child life specialists have unique qualifications and training,

allowing them to focus specifically on these elements of pediatric care. This study utilizes child life specialists to provide directed medical play. Finally, there were no studies located focusing on the impact of directed medical play on the pain, distress and anxiety experienced by the pediatric burn population and the caregivers of these children. The potential benefits of this study include extending our knowledge of effective methods to prepare young children for painful medical procedures to include therapeutic play as tool to increase understanding and decrease anxiety, pain and distress in children.

The objective of this study was to investigate whether children between the ages of 3 and 7 with burn injuries who receive directed medical play delivered by a child life specialist just before their first burn wound dressing change self-report less pain and show fewer pain/distress behaviors than children who have standard burn wound care preparation provided by a burn clinic nurse (standard care). Secondary outcomes were parent state anxiety and satisfaction with burn wound care.

Method

A quasi-experimental design was used for this pilot clinical intervention study. Participants were assigned to groups based upon the day of their clinic appointment. A child life specialist was available to conduct the study intervention three mornings a week. During the period of enrollment, young children and their caregivers who consented to participate in the study on these three days received directed medical play. Children who received care on the two days the child life specialist was not available received standard care provided by the burn clinic nurse.

Setting and Sample

Data were collected from an outpatient facility located immediately outside of the Inpatient Burn Unit in a large academic medical center. The clinic serves children and adults from a wide geographical area in the southeastern US. The staff includes a nurse manager, nurse practitioner, two burn wound specialists, and a medical receptionist.

Children and their parent/guardian were recruited from the Burn Clinic between November 2010 and June 2012. Eligibility criteria included children who were between the ages of 3 and 7, receiving their first burn wound care procedure in the burn clinic and who provided assent. Inclusion criteria for the parent or guardian were 18 years or older, able to read and understand English and provide informed consent. If the child required intravenous sedation during the procedure, refused participation or became otherwise unable to communicate during wound care, the child was withdrawn from the study. This study was approved by the Institutional Review Board and included parental informed consent and child assent procedures.

Medical Play Intervention

Within the scope of this study, the effects of only guided, or directed, medical play were examined. The directed medical play session was introduced to each study participant using a standard script. The child life specialist assessed the interests and nonverbal cues of each

child (e.g., withdrawal, engaging) to meet the ultimate goals of mastery, control, education and familiarization.

To standardize each medical play session, the same group of medical equipment (blood pressure cuff, thermometer, scissors, tweezers, washcloths, play camera, ointment/cream, commonly used dressings, gauze, tape, Ace wraps, Acticoat as well as a teaching puppet or doll) were offered to each child to manipulate and play with in the same sequence the child experiences during burn wound care, guided by the child life specialist. This is typical of the current standard of care provided by the child life specialist in the burn center.

Standard Care

Children were prepared for the burn wound care procedure by the burn clinic staff using verbal explanations of the procedure. The burn clinic staff prepared the patient and family member in the treatment room just prior to the procedure, and had access to toys that may be used to distract the patient during the procedure.

Measures

All self-report instruments were administered verbally by a member of the research team in a room selected for privacy in the burn clinic. The parent/guardian completed a state anxiety assessment (STAI; Spielberger, Gorsuch & Lushene, 1970) and a demographic information form prior to the burn wound care procedure. Child participants were oriented regarding how to rate their pain using the Faces Pain Scale (FPS; Belville & Seupaul, 2005; Hicks, Von Baeyer, Spafford, Van Korlaar, & Goodenough, 2001) (min=0, max=6) and asked to try using the FPS to complete a pre-procedure pain measure. Children completed the single item FPS twice following the wound care procedure. Immediately after the procedure, they were asked to remember how they felt while having the old dressing removed and to choose the face for how they felt during that time for the during procedure measure. Then they were asked how they felt now that the dressing change was finished for the post-procedure measure. In addition, child pain and distress behaviors were observed by a trained member of the research team during the entire burn care procedure. The observed behaviors were recorded using the FLACC (Merkel, Voepel-Lewis, Shayevitz, & Malviya, 1997; Nilsson, Finnstrom, & Kokinsky, 2008) The FLACC is composed of 5 categories: Face, Legs, Activity, Cry, Consolability, each given a score of 0 to 2. Higher scores on the FLACC indicate higher levels of distress. Immediately after the procedure, the parents completed the STAI again, as well as a parent satisfaction questionnaire (How Did We Do?). The internal consistency of the STAI scores prior to the procedure was 0.92 (Cronbach's alpha); after the procedure the respective reliability was 0.94.

Statistical Analysis

Data were entered into an SPSS database by a research assistant. To ensure accuracy of data entry, the PI randomly selected 10% of the records for double entry checks. Frequency distributions of all raw data were evaluated for any outlying values and checked against the values recorded on the respective data collection sheet. Nominal and ordinal data were summarized using frequency distributions. Due to the small group sizes (N=9 and 12), continuous data were summarized using median and minimum, maximum values.

Demographic and clinical characteristics were compared using Chi-Squared Tests of Independence (nominal, ordinal variables) and Mann-Whitney Tests (continuous variables). Mann-Whitney Tests were also used to test for differences between the measures with a single pre-post score (e.g., length of time for preparation and the procedure, FLACC, parent satisfaction). Linear mixed effects analysis using a tweedle with log-link function was used to test for differences in the patterns of change in the FPS and STAI scores between the two study groups. All tests of statistical significance maintained a Type I error rate of 0.05 (i.e., $p < .05$).

Results

Twenty-one children participated in this pilot study, 12 in the medical play group and 9 in the standard care group. Figure 1 depicts the participant flow through this quasi-experimental study. Both male and female children were enrolled. The majority of children attended preschool or kindergarten. Most of the caregivers were mothers with a high school or college education and a Caucasian racial background. There were no statistically significant between group differences in demographic characteristics (see Table 1).

The majority of burns ($n = 6$) were caused by a hot water, coffee, or tea spill. All of the children (except three) had second degree burns. Two children had more severe first degree burns. One child in the medical play group had first, second and possibly third degree burns. Typically children with more superficial first degree burns are treated by their family at home and do not require a dressing change in the burn clinic. Children with more severe third degree burns are hospitalized with multiple dressing changes occurring before their first appointment in the burn clinic. Clinical characteristics of the children and the burn are summarized in Table 2. A statistically significantly higher percentage of children in the medical play group had burns to the arms and hands compared to the standard care group (8 of 12, 66.7% vs. 0 of 9, 0.0%) which was comprised largely of burns to legs, feet, and multiple locations (6 of 9, 66.6%) ($X^2_{(df=3)}=9.7, p=0.021$).

Two children (one in each group) received stitches in the past year. This previous experience could have contributed to their pain perceptions and behavior during the burn wound dressing change. Three children had medical conditions (asthma, kidney surgery at two months of age, hernia repair at six months) that were less likely to contribute to their pain experience during the procedure. Two children (one in the medical play group and the other in the control group) had unspecified previous medical procedures.

Seven of 12 children in the medical play group received pre-medication for pain before their first burn wound dressing change. Four of these children received a pre-medication containing codeine, two hydrocodone, and one child received Ibuprofen (Advil). The pre-medications were given between 2 h 10 min. and 4 h 15 min. before the procedure.

Seven of nine children in the nurse preparation group received pre-medication for pain. One child received a medication containing codeine, four hydrocodone and two children received ibuprofen. The time between pre-medication and procedure ranged from 1 h 55 min. and 8 h 30 min. in the control group.

As would be expected, the median time for burn wound care preparation was considerably longer in the intervention than in the control group (10 minutes vs. 1 minute, Mann-Whitney test, $z=2.90$, $p=0.004$). The length of the medical play sessions in the intervention group ranged from 5 to 14 minutes. Medical play is a child driven activity and the length of sessions was influenced by the child's anxiety level, understanding of the procedure and the length of time the child wanted to play with the medical equipment. Length of sessions was also influenced by the number of questions asked by the child and their caregiver. Caregiver preparation included observation of the medical play sessions. They were also encouraged to ask the child life specialist any questions they had about the procedure. No statistically significant differences between the groups were observed in actual length of procedure (Mann-Whitney, $p > 0.05$). The median time for procedure was 25.0 minutes (IQR=6-94 minutes), which was not statistically significantly different between groups.

As summarized in table 3, no statistically significant findings were observed in this pilot study. Nevertheless the descriptive summaries illustrate that the effects were in the hypothesized direction and were directionally consistent. Children who participated in directed medical play experienced lower median distress values during their dressing change than those receiving standard preparation. All but one of the 11 children who participated in the medical play group, and had both pre- and post-procedure FPS pain scale scores, reported the same or lower scores after the procedure than they had prior to the procedure (7 with the same score, 2 decreased by 1 face, 1 by 2 faces). On the other hand, only 1 of the 6 children in the standard care group with pre- and post-FPS scores demonstrated a decrease in pain. Three of the 6 had the same score while 1 child had a 3 face increase and another child had a 4 face increase. While median parental satisfaction with the care their children received was higher for those in the medical play group than in the standard care group, the difference was not statistically significant (see Table 3).

Discussion

Directed medical play as a part of procedural preparation, has been theorized and has demonstrated in surgical settings the ability to decrease anxiety and/or distress during invasive procedures by providing information, affording rehearsal of coping skills, and allowing for control, mastery and expression in children. (Li et al., 2007; Li & Lopez, 2008; Barnett & Storm, 1981; Barnett, 1984; Rollins, Bolig & Mahan, 2005; Wolfer & Visintainer, 1975). Li et al. (2007) and Li & Lopez (2008) concluded that the children in the medical play group perceived the surgery to be less threatening because the intervention enhanced their perception of control as they learned both problem and emotion-focused coping skills. Parents reported less pre-operative anxiety and greater satisfaction with the care their child received. Results of this study support the conclusions from previous research.

The current study has several important strengths. A step-by-step protocol was developed for the medical play procedure so that child life specialists would be consistent in their implementation of the intervention. One research nurse was assigned primary responsibility for data collection. However, several other nurses served as back-up when she was unavailable. To make sure that data collection, using the FLACC scale, was consistent between observers, all research personnel watched several videotaped burn wound dressing

changes and scored them independently. Results were compared and any discrepancies were discussed and a consensus was reached on how to score the child observations.

A randomized controlled trial would have been the ideal design for this type of study. However child life specialists were available in the burn clinic only three days a week. Although not strictly randomized, we feel confident that assigning group by day of the week did not produce unequal groups. In addition, if we had randomized, there is a good possibility that diffusion of intervention would have occurred.

The primary weakness of this pilot study was the small sample size. Participant recruitment was slower than expected due to several issues. The number of children meeting eligibility criteria were fewer than anticipated. Turnover in the burn clinic, both nurses and child life specialists, resulted in breaks in recruitment while training was completed for new study personnel. Time limits on funding prevented the recruitment of eligible subjects after June 2012.

Another weakness was the lack of cultural diversity of study subjects. Sixteen children were Caucasian and five were African-American. Three Hispanic families were excluded from the study because they only spoke Spanish.

When the study was first implemented, FPS scores were only collected at baseline and post-procedure. The FLACC was used to obtain a measure of child distress during the procedure itself. After gathering data on seven subjects, a decision was made to obtain an additional FPS score by asking the child to rate their pain during the procedure. The change in procedure resulted in post-procedure scores being collected on 18 children.

While the provision of directed medical play is an intervention unique to the expertise and training of child life specialists, nurses can use play as a tool to build rapport and promote a therapeutic environment. Pediatric nurses have been using play (even directed medical play) in their practices to provide therapeutic care and emotional support to children and their families for a very long time. This is evident in the literature as a larger number of medical play studies used nurses rather than child life specialists to deliver the intervention.

In the early years of the development of pediatrics as a medical specialty, nurses were encouraged to use play as a part of the daily care of the pediatric patient. Parents were not allowed to be present at the bedside for the majority of hospitalization and the role of the child life specialist had not yet been defined. Child life specialists, who provide supportive care in addition to the nursing role, are specifically qualified to address the needs of children in health care settings. As health care has modernized and family centered care has become common practice, provision of a therapeutic, or healing, environment is the collaborative responsibility of all members of the multidisciplinary team (Chambers, 1993; Jessee, 1992).

Young children may have difficulty with behavioral control, particularly during painful and frightening procedures. If the child is unable to control his or her behavior (i.e., remain still during dressing removal and wound cleaning) sedation is required. Children typically receive propofol for moderate sedation and ketamine for sedation during a painful procedure. A more potential, be it intangible, benefit of the use of directed medical play is

the reduction in anxiety for the parent. This outcome may result in high parent satisfaction with burn wound care, which may increase the likelihood that they would return for care and recommend that others seek care at our facility.

This study, with its definite limitations, does clearly demonstrate outcomes in the expected direction for directed medical play. Future research with a larger sample size or across multiple sites could increase the statistical significance of the findings. Also, it is possible that the instrument (FLACC), originally developed for use in clinical practice and not research, was not sensitive enough to show differences between groups. While the results are more clinically significant than statistically significant, those working with children undergoing painful medical procedures should take notice of the implications of research such as this. Strategies, such as the use of directed medical play as part of a package of psychological preparation, designed to reduce pain and distress should be considered as a means of improving the overall experience for children and their caregivers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Medical (therapeutic) play's effects on anxiety and pain in the healthcare setting in children and caregivers

Randomized Controlled Trials and Quasi-experimental designs

Source	Sample/Setting	Study Design/Method	Interventions/Rationale	Instruments	Findings	Comments
Bloch & Toker, 2008	91 children, age 3y-6.5y in Israel, all research related observations taking place at a medical center, in a central courtyard	Quasi-experimental with group assignment depending on the location of the age matched kindergarten from which participants were recruited	Intervention: 41 children participated in a half day "Teddy Bear Hospital." Children selected a "diagnosis" for their toy and went through a play hospital setting with medical students as the "physicians" and kindergarten teachers as the guides of the children Control: 50 children, age matched with the intervention group, were not provided any type of medical play or other play opportunity outside regular school day activities.	One item visual analog scale for child report of anxiety if they were about to be hospitalized, assessed one day before and one week following the intervention	Children in the intervention group reported significantly lower anxiety levels than the control group at one week follow up. Baseline levels of anxiety were not significantly different between the groups.	Study participants were not currently hospitalized, but play's impact on anxiety regarding attitudes towards hospitalization were examined. This study demonstrated short term reduction of anxiety and suggested that more follow up medical themed play opportunities could continue the effect.

Source	Sample/Setting	Study Design/Method	Interventions/Rationale	Instruments	Findings	Comments
Brewer, Gleditsch, Syblik, Tietjens, & Vacik, 2006	142 children, ages 5-11 years old, undergoing elective otolaryngology surgery	Quasi-randomized with alternate assignment to groups	Intervention: 80 children received formal preparation, including a directed medical play opportunity with medical equipment relevant to the surgical process, provided by child life specialists Control: 62 children received standard/usual care provided by nursing staff.	Child Drawing: Hospital instrument – designed to measure the emotional status of hospitalized school age children; administered pre- and post-intervention to both groups	The anxiety score change was significantly better for the children in the intervention group than for those in the control group.	The increase in anxiety scores in the control group suggests that children could benefit from preoperative preparation. The information in the study is useful in deciding whether all children, not just those with a perceived need, should be prepared for surgery.
Burns-Nader, Hernandez-Reif & Thoma, 2013	72 caregiver-child dyads who were attending a scheduled or walk-in pediatrician appointment	RCT, children assigned to one of four groups: medical play, medical information video, typical play and a control group who watched a video unrelated to the medical setting. Assignment done by using random numbers generated by a computer software program.	The medical play group interacted in a non-directed fashion with medical equipment. The medical information video group watched a video depicting a medical play session. The typical play group had access to a board game. The control group watched a video about safari life.	Background questionnaire, completed at the beginning of the visit; nurse report of children's behaviors, completed after triage of the child and during triage; child report mood scale, completed before and after assigned activities and after doctor visit.	No significant differences were found in children's backgrounds. The mood scale was validated and the findings suggested that medical play lowered the children's moods and the medical information video raised the children's moods. The medical play group, according to nurse report, displayed more difficulty during triage than did any of the children in all other groups.	Findings contradicted previous research about play's effect on distress, perhaps because the medical play provided was non-directed. Children weren't able to have questions answered or misconceptions clarified as they interacted with the medical equipment. Overall, the children in the study did not demonstrate high levels of stress in the pediatrician's office setting.
Hatava, Olsson & Lagerkranser, 2000	160 children ages 2-11 years undergoing ENT surgeries in Stockholm, Sweden	Quasi-experimental with historical group assignment happening before the intervention program was provided and after it became available	Intervention group: 80 children received specific information, including role play, from a nurse anesthetist at a preadmission visit Control group: 80 children received conventional verbal information from an ENT nurse	Investigator created questionnaire including parent and child report of preoperative information provided and emotional differences of pre-medication, OR activities and induction of anesthesia	Preoperative care was rated to be better in the intervention group than control group. Statistically significant differences in children's positive responses to anesthetic events in intervention group. Younger	Poor agreement between child and parent responses to questionnaire suggesting that their assessments of each experience was made independently. Overall, the intervention seemed to most beneficial for children under 5 years of age.

Source	Sample/Setting	Study Design/Method	Interventions/Rationale	Instruments	Findings	Comments
					children expressed more fear than the older children.	
Li, Lopez & Lee, 2007	203 7-12 year old children admitted for day surgery in Hong Kong. All children spoke Cantonese and could read Chinese.	RCT, two-group pre-test and repeated post-test, between subjects design. Group assignment was determined by drawing balls from a bag labeled either "experimental" or "control."	Intervention group: received a tour of unit and therapeutic play (guided by one of the investigators) in a group setting with parent present Control group: received routine information about 1-2 weeks before surgery; preparation provided by nurses in the day surgery unit	Chinese State Anxiety Scale for Children (CSAS-C) given on day of pre-admission visit, the day of surgery and after the surgery Children's Emotional Manifestation Scale (CEMS) to measure emotional response to anesthesia induction. Visual Analog Scale (VAS) to measure postoperative pain	Children in the intervention group reported significantly lower state anxiety and had fewer negative responses to anesthesia induction than those in the control group. Post-operative pain between the groups showed no significant difference.	Results similar to Zahra's (1998) study, details noted in this table.
Li & Lopez, 2008	203 7-12 year old children admitted for day surgery in Hong Kong. All children spoke Cantonese and could read Chinese.	RCT, two-group pre-test and repeated post-test, between subjects design. Group assignment was determined by drawing balls from a bag labeled either "experimental" or "control."	Intervention group: received tour of unit and therapeutic play (guided by one of the investigators) in a group setting with parent present Control group: received routine information about 1-2 weeks before surgery; preparation provided by nurses in the day surgery unit	Chinese State Anxiety Scale for Children (CSAS-C) given on day of pre-admission visit, the day of surgery and after the surgery Chinese version of State Anxiety Scale for Adults to measure caregiver anxiety Postoperative Parents' Satisfaction Questionnaire to measure parent perception of the preoperative information	Both children and parents in the intervention group reported significantly lower state anxiety in the pre-operative period and in the postoperative period than the control group. Parents reported higher levels of satisfaction with the provision of therapeutic play despite the traditional cultural view that play is less important for hospitalized children and it adds time to the pre-admission visit.	The researchers suggest that the inclusion of parents in the therapeutic play intervention (as observers) provides benefit to the parents, as well as the children. Parents still reported higher levels of satisfaction with the provision of therapeutic play despite the traditional cultural view that play is less important for hospitalized children and it adds time to the pre-admission visit.
Wee, Chan, Cheung Li, Liam & Hong-Gu, 2014	17 children scheduled for elective surgery in Singapore	RCT with randomization based on a random numbers table	Intervention group: 9 children received therapeutic play in addition to standard care pre-operatively Control group: 8 children received standard care pre-operatively	State Anxiety Scale for Children (SAS-C), Children Emotional Manifestation Scale and Numerical Rating Scale	The percentage change in state anxiety between groups was not significant over the three times anxiety	This was a pilot study with a small sample size. Many details of the study methods are not included in the article.

Source	Sample/Setting	Study Design/Method	Interventions/Rationale	Instruments	Findings	Comments
				(for post-operative pain)	was measured. No significant difference in post-operative anxiety between groups. There was a significant difference in pre-operative anxiety, with anxiety being lower for the intervention group. Children in the intervention group exhibited significantly fewer negative emotion behaviors. Children in the intervention group had lower ratings of post-operative pain, but not to statistical significance.	
Wolfer & Visintainer, 1975	80 children scheduled for elective minor surgery and their parents	RCT, with assignment to groups being described simply as "random assignment." However, to reduce potential influence between groups when patients were admitted to adjacent beds in the same room, patients assigned to the same rooms were all placed in the same group, either control or experimental. Room assignment was made in advance by the admissions office based on age and gender of the child without any knowledge of the research conditions.	Intervention group: 45 children were provided with accurate information about surgery including sequence of events, sensory information, child role expectations and appropriate responses, previews of procedures using play techniques and supportive care pre-and post-operatively Control group: 35 children received regular nursing care	Pulse rates measured at admission and at certain stress points (blood draw, preoperative injections, transport to OR) Manifest upset scale and cooperation scale used to measure the child's emotional state and cooperation Ease of fluid intake post-operatively Measurement of pain medications ordered post-operatively Time to first voiding Post-hospital Behavior Questionnaire to measure post-hospital upset Parent	Hypothesis was supported that children and parents who received systematic psychological preparation and supportive care showed significantly less upset behavior, more cooperation and fewer post-hospital adjustment behaviors than those in the control group. Children in the experimental group had greater ease of fluid intake, shorter time to voiding and lower heart rates.	This was the first in a planned series of landmark studies meant to operationalize the construct of psychological preparation and supportive care for parents and children on a pediatric unit.

Source	Sample/Setting	Study Design/Method	Interventions/Rationale	Instruments	Findings	Comments
				questionnaires, investigator created	Parents in the experimental group had significantly lower self-ratings of anxiety and greater satisfaction with care than parents in the control group.	
Zahr, 1998	100 preschool children in Lebanon, one day prior to surgery experiences	Quasi-randomized, with group assignment based on the date of hospital admission	Intervention group: 50 children provided with therapeutic play in the form of an interactive puppet show pertaining to the surgery. Children in this group also provided the opportunity to explore and have free play in the hospital playroom. Control group: 50 children provided with standard of care for pre-surgery admission, which didn't necessarily include a planned visit to the playroom pre-operatively	Blood pressure, pulse rates & time to first void Manifest upset scale and cooperation scale used to measure the child's emotional state and Cooperation Post-hospital Behavior Questionnaire to measure post-hospital upset	Children in the experimental group were found to be calmer, but not more cooperative than those in the control group. At the time of pre-operative injection, the intervention group had significantly lower BP and pulse rate than the control group. Time to first void was significantly shorter for the intervention group. Significantly fewer post-hospital adverse behaviors were reported in children in the intervention group.	Even with cultural differences between these children and those in Western cultures, the children in this sample manifested decreased anxiety and physiological distress when they were prepared for surgery.

References

- Barnett L, Storm B. Play, pleasure, and pain: the reduction of anxiety through play. *Leisure Sciences*. 1981; 4(2):161–175.
- Barnett LA. Research note: young children's resolution of distress through play. *Journal of Child Psychology and Psychiatry*. 1984; 25(3):477–483. [PubMed: 6746795]
- Belville RG, Seupaul RA. Pain measurement in pediatric emergency care: a review of the faces pain scale-revised. *Pediatric Emergency Care*. 2005; 21(2):90–93. [PubMed: 15699816]
- Bloch YH, Toker A. Doctor, is my teddy bear okay? The “Teddy Bear Hospital” as a method to reduce children's fear of hospitalization. *Israel Medical Association Journal*. 2008; 10(8-9):597–599. [PubMed: 18847160]

- Blount R, Corbin S, Sturges J, Wolfe V, Prater J, James LD. The relationship between adults' behavior and child coping and distress during BMA/LP procedures: A sequential analysis. *Behavior Therapy*. 1989; 20:585–601.
- Brewer S, Gleditsch S, Syblik D, Tietjens M, Vacik H. Pediatric anxiety: Child life intervention in day surgery. *Journal of Pediatric Nursing*. 2006; 21(1):13–22. [PubMed: 16428010]
- Burns-Nader S, Hernandez-Reif M, Thoma SJ. Play and video effects on mood and procedure behaviors in school-aged children visiting the pediatrician. *Clinical Pediatrics*. 2013; 52(10):929–935. [PubMed: 23819999]
- Burnstein S, Meichenbaum D. The work of worrying in children undergoing surgery. *Journal of Abnormal Child Psychology*. 1979; 7(2):121–132. [PubMed: 469106]
- Bush J, Melamed B, Sheras P, Greenbaum P. Mother-child patterns of coping with anticipatory medical stress. *Health Psychology*. 1986; 5(2):137–157. [PubMed: 3732228]
- Chambers C, Craig K, Bennett S. The impact of maternal behavior on children's pain experiences: an experimental analysis. *Journal of Pediatric Psychology*. 2002; 27(3):293–301. [PubMed: 11909936]
- Chambers M. Play as therapy for the hospitalized child. *Journal of Clinical Nursing*. 1993; 2:349–354.
- De Young A, Hendrikz J, Kenardy J, Cobham V, Kimble R. Prospective evaluation of parent distress following pediatric burns and identification of risk factors for young child and parent posttraumatic stress disorder. *Journal of Child and Adolescent Psychopharmacology*. 2014; 24(1):9–17. [PubMed: 24494782]
- Felder-Puig R, Maksys A, Noestlinger C, Gadner H, Stark H, Pfluegler A, Topf R. Using a children's book to prepare children and parents for elective ENT surgery: Results of a randomized clinical trial. *International Journal of Pediatric Otorhinolaryngology*. 2003; 67(1):35–41. [PubMed: 12560148]
- Gaynard, L.; Wolfer, J.; Goldberger, J.; Thompson, R.; Redburn, L.; Laidley, L. Psychosocial care of children in hospitals: A clinical practice manual from the ACCH Child Life Research Project. Rockville: Child Life Council; 1998.
- George A, Hancock J. Reducing pediatric burn pain with parent participation. *Journal of Burn Care & Rehabilitation*. 1993; 14(1):104–107. [PubMed: 8454655]
- Hatava P, Olsson GL, Lagerkranser M. Preoperative psychological preparation for children undergoing ENT operations: a comparison of two methods. *Pediatric Anesthesia*. 2000; 10(5):477–486. [PubMed: 11012950]
- Hicks CL, von Baeyer CL, Spafford PA, van Korlaar I, Goodenough B. The Faces Pain Scale-Revised: toward a common metric in pediatric pain measurement. *Pain*. 2001; 93(2):173–183. [PubMed: 11427329]
- Jessee P. Nurses, children and play. *Issues in Comprehensive Pediatric Nursing*. 1992; 15:261–269. [PubMed: 1340875]
- Koller, D. Child Life Council evidence-based practice statement. Child Life Assessment: Variables associated with a child's ability to cope with hospitalization. 2008 Aug. Retrieved May 26, 2009, from <http://www.childlife.org/files/EBPAssessmentStatement-Complete.pdf>
- LaMontagne LL, Wells N, Hepworth JT, Johnson BD, Manes R. Parent coping and child distress behaviors during invasive procedures for childhood cancer. *Journal of Pediatric Oncology Nursing*. 1999; 16(1):3–12. [PubMed: 9989012]
- Li HCW, Lopez V, Lee TL. Effects of preoperative therapeutic play on outcomes of school-age children undergoing day surgery. *Research in Nursing & Health*. 2007; 30:320–332. [PubMed: 17514706]
- Li HCW, Lopez V. Effectiveness and appropriateness of therapeutic play intervention in preparing children for surgery: A randomized control trial study. *Journal for Specialists in Pediatric Nursing*. 2008; 13(2):63–84. [PubMed: 18366374]
- Lumley M, Melamed B, Abeles L. Predicting children's presurgical anxiety and subsequent behavior changes. *Journal of Pediatric Psychology*. 1993; 18(4):481–497. [PubMed: 8410571]
- Lynch M. Preparing children for day surgery. *Child Health Care*. 1994; 23(2):75–85. [PubMed: 10171871]

- Merkel SI, Voepel-Lewis T, Shayevitz JR, Malviya S. The FLACC: a behavioral scale for scoring postoperative pain in young children. *Pediatric Nursing*. 1997; 23(3):293–297. [PubMed: 9220806]
- Nilsson S, Finnstrom B, Kokinsky E. The FLACC behavioral scale for procedural pain assessment in children aged 5–16 years. *Pediatric Anesthesia*. 2008; 18(8):767–774. [PubMed: 18613934]
- Phillips C, Rumsey N. Considerations for the provision of psychosocial services for families following paediatric burn injury--a quantitative study. *Burns*. 2008; 34(1):56–62. [PubMed: 17618055]
- Roberts MC, Wurtele SK, Boone RR, Ginther LJ, Elkins PD. Reduction of medical fears by use of modeling: a preventive application in a general population of children. *Journal of Pediatric Psychology*. 1981; 6(3):293–300. [PubMed: 7288535]
- Rollins, J.; Bolig, R.; Mahan, CC. Meeting Children's Psychosocial Needs Across the Health-care Continuum. Austin: ProEd; 2005. Play in health care settings.
- Smith A, Murray D, McBride C. A comparison of nurses' and parents' or caregivers' perceptions during pediatric burn dressing changes: An exploratory study. *Journal of Burn Care & Research*. 2011; 32(2):185–199. [PubMed: 21252691]
- Spagrud L, von Baeyer C, Ali K, Mpofu C, Fennell L, Friesen K, Mitchell J. Pain, distress, and adult-child interaction during venipuncture in pediatric oncology: An examination of three types of venous access. *Journal of Pain and Symptom Management*. 2008; 36(2):173–184. [PubMed: 18400458]
- Spielberger, CD.; Gorsuch, RL.; Lushene, RE. STAI Manual for the State-Trait Anxiety Inventory. Palo Alto: Consulting Psychologists Press; 1970.
- Thompson, R., editor. The Handbook of Child Life: A Guide for Pediatric Psychosocial Care. Springfield: Charles C. Thomas Publishers, LTD; 2009.
- Tiedeman ME. Anxiety responses of 5- to 11-year-old children during and after hospitalization. *Journal of Pediatric Nursing*. 1997; 12(2):110–119. [PubMed: 9103779]
- Webb J. Play therapy with hospitalized children. *International Journal of Play Therapy*. 1995; 4(1):51–59.
- Wee C, Chan S, Cheung Li W, Hong-Gu H. Research in brief: A pilot study of the effectiveness of therapeutic play intervention on outcomes of children undergoing inpatient elective surgery. *Singapore Nursing Journal*. 2014; 41(2):35–37.
- Wolfer J, Visintainer M. Pediatric surgical patients' and parents' stress responses and adjustment. *Nursing Research*. 1975; 24(4):244–255. [PubMed: 1101231]
- Zahr L. Therapeutic play for hospitalized preschoolers in Lebanon. *Pediatric Nursing*. 1998; 24(5):449–54. [PubMed: 9832904]

Figure 1. Participant Flow Diagram

Table 1

Child and Caregiver Demographic Characteristics

	Overall (N=21)	Medical Play (N=12)	Standard Care (N=9)	p-value
	N, Median (Min,Max)	N, Median (Min,Max)	N, Median (Min,Max)	
Child age in years	21, 3.0 (3,6)	12, 3.0 (3,5)	9, 3.0 (3,6)	0.782
Child gender	N (%)	N (%)	N (%)	0.445
Male	9 (42.9)	6 (50.0)	3 (33.3)	
Female	12 (57.1)	6 (50.0)	6 (66.7)	
Child racial/ethnic background				0.375
African American	5 (23.8)	2 (16.7)	3 (33.3)	
Caucasian	16 (76.2)	10 (83.3)	6 (66.7)	
Child school status				0.097
Does not attend school	7 (33.3)	2 (16.7)	5 (55.6)	
Preschool	7 (33.3)	6 (50.0)	1 (11.1)	
Kindergarten and above	7 (33.3)	4 (33.3)	3 (33.3)	
Caregiver relationship to child				0.748
Mother	17 (81.0)	10 (83.3)	7 (77.8)	
Other	4 (19.0)	2 (16.7)	2 (22.2)	
Caregiver gender				0.830
Male	2 (9.5)	1 (8.3)	1 (11.1)	
Female	19 (90.5)	11 (91.7)	8 (88.9)	
Caregiver educational level				0.309
High School	9 (42.9)	4 (33.3)	5 (55.6)	
College	12 (57.1)	8 (66.7)	4 (44.4)	
	N, Median (Min,Max)	N, Median (Min,Max)	N, Median (Min,Max)	
Caregiver age in years	20, 33.0 (20,54)	11, 34.0 (20,44)	9, 28.0 (23,54)	0.196

Table 2
Child clinical characteristics

	Overall (N=21)	Medical Play (N=12)	Standard Care (N=9)	<i>p- value</i>
	N (%)	N (%)	N (%)	
Other medical conditions				0.350
No	14 (66.7)	9 (75.0)	5 (55.6)	
Yes	7 (33.3)	3 (25.0)	4 (44.4)	
Time since burn				0.528
1 day	11 (52.4)	7 (58.3)	4 (44.4)	
> 1 day	10 (47.6)	5 (41.7)	5 (55.6)	
Location of burn				0.021
Arms, hands	8 (38.1)	8 (66.7)	0 (0.0)	
Chest, abdomen	4 (19.0)	1 (8.3)	3 (3.3)	
Legs, feet	3 (14.3)	1 (8.3)	2 (22.2)	
Multiple locations	6 (28.6)	2 (16.7)	4 (44.4)	
Pre-medicated for pain				0.577
No	7 (33.3)	5 (41.7)	2 (22.2)	
Yes	14 (66.7)	7 (58.3)	7 (77.8)	
	N, Median (Min,Max)	N, Median (Min,Max)	N, Median (Min,Max)	
Length of time burn wound	19, 5.0 (0,25)	10, 10.0 (5,14)	9, 1.0 (0,25)	0.004
care prep (minutes)				
Length of procedure (minutes)	21, 25.0 (6,94)	12, 29.0 (6,94)	9, 20.0 (11,60)	0.476

Table 3
Summaries of Key Study Variables

	Overall (N=21)	Medical Play (N=12)	Standard Care (N=9)	<i>p</i>-value
	N, Median (Min,Max)	N, Median (Min,Max)	N, Median (Min,Max)	
Child pain (FPS) ^a				0.717
Baseline	20, 1.0 (1,7)	12, 1.0 (1,7)	8, 1.0 (1,2)	
During dressing change	14, 3.0 (1,7)	7, 2.0 (1,7)	7, 3.0 (1,4)	
Post dressing change	18, 1.0 (1,7)	11, 1.0 (1,7)	7, 1.0 (1,6)	
Distress behaviors during dressing change (FLACC)	21, 1.0 (0,8)	12, 0.5 (0,8)	9, 2.0 (0,7)	0.165
Parent state anxiety (STAI) ^b				0.421
Baseline	20, 33.5 (20,61)	11, 29.0 (20,61)	9, 21.0 (20,63)	
Post procedure	20, 26.0 (20,63)	11, 35.0 (25,57)	9, 32.0 (20,55)	
Parent satisfaction (HDWD)	21, 38.0 (31,40)	12, 39.0 (32,40)	9, 37.0 (31,40)	0.292

^a N=7 with all 3 times: Main effects: Group: $p = 0.753$, Time: $p = 0.010$; Interaction effect: $p = 0.717$

^b Main effects: Group: $p = 0.103$, Time: $p = 0.001$; Interaction effect: $p = 0.421$