THE EFFECTS OF MEDICAL PLAY ON REDUCING ANXIETY, FEAR AND PROCEDURE DISTRESS IN SCHOOL-AGED CHILDREN GOING TO VISIT THE DOCTOR

by

ELIZABETH SHERWOOD BURNS-NADER

MARIA HERNANDEZ-REIF, COMMITTEE CO-CHAIR
STEVE THOMA, COMMITTEE CO-CHAIR
ASHLEY EVANS
PEGGY JESSEE
BRAD LIAN
CARROLL TINGLE

A DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in the Department of Educational Psychology
in the Graduate School of
The University of Alabama

TUSCALOOSA, ALABAMA

2011

ABSTRACT

Play promotes typical development and allows children to express their fears, anxieties, and misconceptions and better cope with stressful experiences. Therefore, play is often used in the medical setting to normalize the experience of doctor visits, hospitalizations, or dental checkups. Medical play is play that involves a medical theme or medical equipment. The purpose of this study is to examine which type of activity (i.e., medical play versus viewing a medical information video versus typical play, versus viewing a non-medical information video) decreases the amount of fear, anxiety, and procedure distress in school-age children going to a doctor's visit. Seventy-two school-aged children visiting a doctor's office were randomly assigned to one of four groups: medical play (e.g., play with a medical buddy and medical equipment, such as a stethoscope), medical information video (e.g., watch a video of a child participating in medical play), typical play (e.g., play a developmentally appropriate board game), and non-medical information video control (e.g., watch a video on safari animals). Child participants completed a fear self-report measure, had their pulse taken, and completed a drawing as a projective measure of anxiety. The child's distress behaviors were assessed through nurse and researcher behavioral observations. Parents completed a demographic questionnaire and a development checklist on their child. Findings revealed the medical information video decreased fear and procedure distress more so than the medical play group, typical play group, and non-medical information video control group. Therefore, the children benefitted more from the medical information video (i.e., the obtainment of information) than the medical play activity (i.e., hands on manipulation), suggesting it is the obtainment of information rather than the actual hands on manipulation of medical items that benefits children. Finally, the typical play activity was found to increase alertness. The findings of this study imply the best way to provide for the

psychosocial needs of patients at a pediatrician's office is to provide information to patients through a video of a child engaging in medical play. In addition, the medical team should consider providing structured activities, such as games, in pediatrician's offices for school-aged children.

DEDICATION

This dissertation is dedicated to my mom and dad. Looking back as far as I can remember, my parents made me feel safe, secure, and loved. They instilled in me the feeling that I could do anything and that I could and should make a difference in the world. My mom and dad have supported me through my education and this project, always encouraging and watching over me. This dissertation is proof that I can do anything and that I can make a difference in the world. All of it started with the love of my mom and dad.

I must also dedicate this dissertation to my husband, Philip. It has been said that "Love is patient and kind, it doesn't envy or boast and it's never proud. It's not rude or selfish, it doesn't get angry easily or keep track of wrongs. Love doesn't delight in bad things but it rejoices in the truth. Love always protects trusts, hopes, and perseveres. Love never fails." (1 Corinthians 13:4). If those things are love, my husband has been the epitome of love through this process. I am thankful each day to have a husband that supports my endeavors to reach for the stars and dare for my dreams. He has helped make this manuscript possible through his love; therefore, it is my honor to dedicate it to him.

LIST OF ABBREVIATIONS AND SYMBOLS

BOS	Behavioral Observation Scale
CCLS	Certified Child life Specialist
CD:H	Child Drawing Hospital
CHEOPS	Children's Hospital of Eastern Ontario Pain Scale
DP-3	Developmental Profile 3
ENT	Ear, Nose, and Throat
E	Epsilon; Statistic referring to sphericity with a value of 1 suggesting sphericity
F	Computed Value from ANOVA showing variances in means of two populations
M	Mean
MA	Master's of Art
MCPS	Missouri Children's Picture Series
MD	Doctor of Medicine
MS	Master's of Science
n	Variable quantity
NRCDS	Nurses' Rating of Child Distress Scale
p	Probability level
PhD	Doctor of Philosophy
SD	Standard Deviation
t	Computed value of *t* test showing whether two means are significantly different
X^2	Computed value of Chi-square test

ACKNOWLEDGMENTS

I am pleased to have the opportunity to thank all of my family, friends, colleagues, and faculty members who have helped me along the way complete this research project. My heart is humbled by the time, energy, kindness, and support I have been shown throughout it. I acknowledge that it is through their support that this dissertation is complete.

I would like to thank my committee members, Maria Hernandez-Reif (co-chair), Steve Thoma (co-chair), Ashley Evans, Peggy Jessee, Brad Lian, and Carroll Tingle. Each read countless pieces of my writings, encouraged me beyond means, invoked a passion for research and teaching within me, and shared with me their wisdom. I am honored to say that I trained under such a group and am blessed to be able to continue their legacy through my work.

This project would not have been possible without the help of The University Medical Center Pediatric Clinic, which served as the site of recruitment. I would like to thank all of the nurses and staff members for their assistance and support with recruitment and data collection. I am also thankful to all of the parents and children who participated in the study. Katie Beard, Morgan Haygood, Colleen Posey, and Lindsey Wright deserve a big thank you for their assistance in recruitment and data collection. Each of these people were truly a catalyst to this project's completion.

Finally, I would like to thank my family, friends, and colleagues. Their love, support, encouragement, and understanding are endless. I am grateful that they continued to believe in me and served as my number one cheerleaders throughout this project. I send them all the love in the world.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

During a medical visit, children may express varying negative reactions, including regression in behaviors, aggression, lack of cooperation, withdrawal, and difficulty recovering from procedures (Hart & Bossert, 1994; Lumley, Melamed, & Abeles, 1993; Skipper & Leonard, 1968). The question arises as to how to best treat a child in the health care setting to prevent or manage negative reactions such as aggression or anxiety. Health care facilities are increasingly employing Certified Child Life Specialists (CCLS) who promote effective coping for children undergoing medical experiences and their families. Certified Child Life Specialists minimize the stress and anxiety of a medical experience and promote typical development within the medical setting for children and their families through psychosocial activities. In the child life profession, individuals earn at minimum a bachelor's degree in child life or a related field (psychology, human development and family studies, etc), have clinical experience implementing child life theories, interventions and approaches through a required 560 hour, hospital-based internship, and have passed a national certification exam administered by the national Child Life Council. The benefits of child life services have been examined throughout medical, psychological, and developmental literature. Classic studies have found decreased anxiety in the child and parent(s) (Visintainer & Wolfer, 1975), increased cooperation during medical procedures, and shorter medical stays (Skipper & Leopard, 1968) after child life interventions. More recently, child life interventions have been found to increase comfort levels (Barkey & Stephens, 2000) and decrease fear (Lacey, Finkelstein, & Thygeson, 2008).

Normalizing the medical experience for a child through play is one of the main roles of a child life specialist. Play is defined as any spontaneous activity that a person voluntarily participates in and finds satisfaction by actively engaging in it (Garvey, 1977). Play is a natural activity for a child that allows for growth in physical, cognitive, and social-emotional areas of development. (Farver, Kin, & Lee-Shin, 2000; Lindsey & Colwell, 2003). In addition to promoting typical development, play appears to allow children to verbally or nonverbally express their fears, anxieties, and misconceptions and better cope with stressful experiences (Clatworthy, 1981). Studies have found that playing reduces anxiety for children in stressful situations (Barnett, 1984; Gariepy & Howe, 2003), particularly when they are allowed to play with an item related to the cause of the stress (i.e., playing with a toy syringe if getting an immunization shot is causing stress in the child) (Barnett & Storm, 1981).

In the medical setting, child life specialists utilize three types of play: normative, medical, and therapeutic play. Normative play is a fun, spontaneous activity (Vessey & Mahon, 1990), such as reading a book, playing a board game, or pretending to be a super hero. Medical play is a fun, activity that involves a medical theme (McCue, 1988), such a medical bingo or playing with medical equipment on a doll. Therapeutic play is an activity that fosters a child to express emotions of difficult events while promoting typical development (Koller, 2008). An example of a therapeutic play activity would be drawing a picture of a stressful experience, such as a medical experience.

Child life specialists utilize medical play daily as one of their interventions to minimize anxiety and increase coping in children in the medical setting. Medial play provides children in the medical setting the opportunity to play with and explore medical themes and equipment they will likely experience while undergoing a medical procedure or hospitalization. Medical play is

designed as a fun activity that may be initiated by an adult but is always led by a child. Once it is started, it allows for the child to gain mastery and control in the medical setting (McCue, 1988). For example, in medical play, children may be allowed to explore common medical equipment, such as a stethoscope, thermometer, syringe, blood pressure cuff, etc. The goal of medical play is that, through playing with medical equipment, children will become familiar with these components and have less anxieties, fears, and misconceptions during upcoming medical experiences (Webb, 1995).

Few experimental studies on medical play exist. Those that do report that children engaged in medical play, both in medical and non-medical settings, have less anxiety (Burstein & Meichenbaum, 1979; McGrath & Huff, 2001). One study found that children who, supervised by a child life specialist, played with typical toys (dolls, playdough, and cars) and medical items (bandages, stethoscope, etc.) displayed less anxiety than a group of children who engaged in non-supervised play with the same items (Ispa, Barrett, & Kim, 1988). Another study compared a group of hospitalized preschoolers who participated in an activity in which the children acted out the hospital admission process (i.e., registering, vitals taken, I.D. badge, etc.) with a teddy bear to a group of preschoolers who did not receive this opportunity. The children in the experimental group (i.e., teddy bear group) reported significantly less anxiety than the control group (Bloch & Toker, 2008).

Statement of Need

Many children are seen in pediatricians' offices and experience anxiety related to visiting the doctor. Studies have examined the effects of medical play on children in the hospital setting (Burstein & Meichenbaum, 1979) and for children in non-medical settings (McGrath & Huff, 2001) and have found that medical play decreases anxiety and allows for a child to express their

anxiety about medical items. However, to date, no study was found that examined the benefits of utilizing medical play in a pediatrician's office. Research on the benefits of medical play in pediatricians' offices would allow child life specialists to determine the need to provide services in this setting to reduce anxiety associated with such a medical visit. Also, it would allow pediatricians, and the other members of the medical team, to better understand what kinds of play should be offered in their office to promote family-centered care and effective coping among pediatric patients. No studies have compared different types of play, such as typical versus medical play, to determine which type of play is more effective at reducing anxiety in children in a pediatricians' office.

Purpose

The purpose of this study was to examine the effects of medical play versus other play and non-play activities (typical play or video) for minimizing anxiety, fear, and procedural distress in school-age children who were visiting a pediatricians' office. Secondly, this study was designed to examine what aspects of medical play reduce anxiety (child-directed play and manipulation of medical tools versus just viewing and listening to a taped medical play session of another child). An experimental design was used in which 72 children were randomly assigned to one of four groups: a medical play group, a medical information video group, a typical play group, or a control video group. Children's anxiety, fear, and procedure distress were assessed using self-reports, projective measures, behavioral observation scales, and nurses' reports.

Hypotheses

The following hypotheses were tested: 1) children who participated in medical play before a doctor's visit would display less anxiety, fear, and procedure distress than children who

viewed a taped medical play session, participated in typical play or watched a video on safari animals; 2) children who participated in medical play would display less anxiety, fear, and procedure distress than children viewing a taped medical play session; 3) children who participated in a typical play activity would display less anxiety, fear, and procedure distress than children who watched a video on safari animals; and, 4) children who view a medical play session video would display less anxiety, fear, and procedure distress than children who watched a video on safari animals.

These hypotheses were expected because: 1) Medical play is an intervention that has goals to promote coping during a medical experience by familiarizing the child with medical equipment and enhancing mastery and control through the expression of anxieties and fears during the play. Therefore, one would expect medical play to be more effective than typical play or video sessions because it allows for hands-on manipulation of medical equipment and the expression of emotions; 2) Medical play familiarizes a child with the medical world by providing the child with information, pictures, or hands-on manipulation. The best way to become familiar with medical equipment is to use all of the senses to learn about it, and this is offered through hands-on manipulation. Therefore, the medical play session would be more effective than the medical information video session because it will allow for the child to manipulate medical equipment, explore their components, and verbalize and discuss their fears and anxieties, while the medical information video session will allow the child just to gain information while watching another child manipulate the equipment; 3) Play allows for a child to express their fears, misconceptions, and anxieties in their own way (Clatworthy, 1981). Therefore, the presence of play will decrease anxiety, fear, and procedure distress more so than a video session because it will allow the child to express any emotions, either verbally or non-verbally, which, in

turn, will promote coping during the doctor's checkup; and 4) Receiving information before a medical experience has been found to decrease anxiety (Kain, et al., 1998). Children who watched a taped medical play session will receive information about medical equipment and become familiar with the equipment by watching another child of a similar age play with it. Therefore, one would expect that a child who views the taped medical play would display less anxiety, fear, and procedure distress compared to a child who did not receive any information about the doctor's visit and just watched a safari animal video.

The study will be further detailed in the remaining four chapters. Chapter 2 is a literature review, which provides background information supporting the need for the study and reviews past studies that are related to the current study. This chapter will also discuss the purpose and hypotheses of the study. Chapter 3 provides a description of the methods used in the study. This includes information about the participants, treatment groups, setting, measures, and data analysis. Chapter 4 contains the results of the study. Finally, chapter 5 provides the discussion of the results, including conclusions, limitations, and implementations.

LITERATURE REVIEW

Children visit medical doctors for many reasons, including receiving immunization shots, well-child checkups, receiving treatments for chronic illnesses, and for the occasional broken bone. During a medical visit, children may express varying negative reactions, including regression in behaviors, aggression, lack of cooperation, withdrawal, and difficulty recovering from procedures (Hart & Bossert, 1994; Lumley, et al., 1993; Skipper & Leonard, 1968). For example, one study examined the responses of 3- to-12 year olds receiving a blood draw and found that 77% of the children displayed verbal expressions of pain and fear, 63% exhibited muscle rigidity, and 63% cried and screamed. The number of stress behaviors exhibited increased until the administration of the procedure (Jacobsen, et al., 1990). In another study, 4-to-10 year olds receiving a minor ear, nose, and throat surgery were separated from parents and were provided anesthesia via induction masks without sedatives; the following distress behaviors were reported: repeated crying, kicking, muscle tension, and physical avoidance (Lumley, et al., 1993).

Although some negative reactions are unavoidable, it is important to minimize a child's anxiety due to a medical visit. It has been shown that when anxiety is minimized, children approach medical situations with a sense of comfort, achievement, and control (Barkey & Stephens, 2000). For example, one study found that children undergoing a minor surgery who coped better in the hospital displayed significantly less emotional distress, more cooperation, and better adjustment after returning home (Visintainer & Wolfer, 1975). Less anxiety for children can also be beneficial to the medical team. Children with less anxiety display more cooperation

during medical procedures (i.e. blood draws), have an easier time drinking fluids post-procedure (Visintainer & Wolfer, 1975), have shorter recovery times (Rozanski & Kubzansky, 2005), and have shorter medical stays (Skipper & Leopard, 1968). These findings suggest that children and the medical team can benefit from having a child's anxiety minimized in regards to medical experiences. However, the question arises as to what methods are effective in minimizing children's anxiety and negative reactions to the medical setting.

Certified Child Life Specialists

To minimize the anxiety associated with medical visits, health care facilities are increasingly employing Certified Child Life Specialists (CCLS) to help children and their families cope effectively with medical visits and anticipated procedures. Child life specialists promote typical development and minimize the stress and anxiety of medical experiences for children through the use of psychosocial interventions to foster effective coping in children experiencing a medical situation. Certified Child Life Specialists have a bachelor's degree in child life or a related field (i.e. human development and family studies, early childhood development, etc), experience and understanding of child life theories, interventions, and approaches through a 560 hour, hospital-based internship, and have passed a national certification exam administered by the Child Life Council. The American Academy of Pediatrics states that child life is "an essential component of quality pediatric health care" (2006).

To determine the needs of a child and family in the medical setting, the child life specialists will conduct a mental assessment. Typically, the child life specialists will first assess the developmental level of the child to determine the child's comprehension level. Developmental level is subjectively examined through observations of the child (e.g., How easily

does the child understand age-appropriate questions?), conversations with the child (e.g., How old are you? What grade are you in?), family (e.g., What does your child like to do at home?), and medical team (e.g., Is there an illness affecting the child's developmental level?) and observations of the child's play (e.g., Are they playing with a developmentally appropriate toy?). Then, the stress potential of the child undergoing medical procedures is subjectively assessed (e.g., Is there a family member present and available to the child? What is the state of mind of the family member? What is the child's temperament?). Ultimately, the CCLS provides age appropriate interventions (e.g., typical play, procedural preparation, self-expressive activities) to minimize the child's stress reactivity to the medical visit or procedure. In summary, the goal of the child life specialist is to help children and their families prevent, manage, and handle stress associated with medical visits.

Child life specialists believe that psychosocial approaches, such as procedure preparation, behavioral control strategies, and complementary activities (i.e. play), are the most effective form of interventions to utilize with children in a medical environment. There is evidence that supports the use of cognitive (i.e. preparation) (Felder-Puig, et al., 2003; Hatava, Olsson, & Lagerkranser, 2000; Nelson & Allen, 1999), behavioral (i.e. focused attention) (French, Painter, & Coury, 1994; Dahlquist, Pendley, Landthrip, Jones, & Steuber, 2002), and complementary (i.e. play) (Goodenough & Ford, 2005; McGrath & Huff, 2001) interventions used by child life specialists.

Procedure Preparation

One goal of child life specialists is to help promote a child's cognitive understanding of a medical experience. In procedural preparation, child life specialists provide children and family members with developmentally appropriate information about an upcoming medical procedure;

this psychosocially equips them for the procedures by promoting cognitive understanding of the procedure and encouraging emotional expressions of fears, anxieties, and misconceptions. As a result preparation reduces stress, provides comfort, and encourages coping abilities in children undergoing medical procedures (Kain, et al., 1998). For example, a study compared a group of children receiving an ear, nose, and throat surgery (ENT) who received procedure preparation to a group of children receiving ENT surgery without procedure preparation. Procedure preparation included a detailed description of the induction process, introduction to the medical team members, familiarization with the operating room through tours, and normalization of medical equipment through play with dolls and equipment. Those children and families in the procedure preparation group reported significantly more knowledge about the procedure than those in the control group; the younger children (five or younger) who received preparation displayed significantly less anxiety than those without preparation, and the older children (six and older) with preparation reported significantly less fear than those without preparation (Hatava, et al., 2000). Preparation through medical dolls (Hatava, et al., 2000), computer programs (Nelson & Allen, 1999), and books (Felder-Puig, et al., 2003) appears to be effective in reducing anxiety in child patients undergoing medical procedures.

Behavioral Control Strategies

Behavioral control strategies are techniques that allow a child undergoing a medical procedure to learn to control their thoughts and behaviors during the procedure in order to promote effective coping during the procedure. Focused attention is a commonly used behavioral intervention by child life specialists that entails teaching and assisting a child to focus on something other than what is happening (i.e., the medical procedure) for a period of time. Focused attention techniques include viewing a media outlet (i.e. cartoons), reading a book,

listening to music, and others. French, et al., (1994) found a simple focused attention technique to be an effective strategy to enhance coping during a routine medical procedure. One hundred and forty nine children (ages 4-to-7 years) visiting a doctor for an immunization injection were randomly assigned to either an experimental group who were trained to use blowing away pain as a focused attention technique during the immunization or a control group who received general information about the immunization. The children taught to blow away the pain during the immunization displayed significantly better coping as indicated by fewer pain behaviors. Another study has found similar results when examining cartoon viewing as a coping method (Cohen, Blount, & Panopoulos, 1997). Focused attention techniques appear to be an effective behavioral control coping strategy child life specialists utilize.

Complementary Strategies

Complementary activities, such as play and humor, are often used by child life specialists to reduce anxiety and promote coping in children within a medical setting. For example, a large number of pediatric facilities recognize the importance of play and have implemented playrooms and play activities throughout their facilities. One study assessed how humor as a coping style in a group of hospitalized children (ages 6-to-12 years) was related to pain. The children had just experienced a medical procedure that caused pain. The children were then administered a scale to assess current and maximum pain and a measure that assessed use of humor as a coping method. Higher ratings for use of humor as a coping style was significantly related to lower levels of pain reported by the child, suggesting that children who utilized humor reported less pain after the procedure (Goodenough & Ford, 2005). Complementary activities allow for normalization of the medical setting by allowing children to bring daily activities like humor inside the medical setting to promote coping.

Play

Play is commonly used by child life specialists to minimize stress and anxiety in the medical environment. Play is something a person actively engages in that is pleasurable, has no extrinsic goals, is spontaneous and voluntary, and relates to reality (i.e., real life experiences) (Garvey, 1977). Play is a universal activity that has the potential of impacting a child's physical, cognitive, and social-emotional development through the exploration of one's environment (Rubin, Watson, & Jambor, 1978).

Decades of research document the benefits of play and highlight the importance of play for children (Farver, et al., 2000; Fisher, 1992; Parten, 1932). Piaget's theory of cognitive development describes how children must be actively involved in exploring their world (play) in order to assimilate and accommodate information and grow intellectually (1970). In one study that examined the relationship between pretend play and emotional competence in preschool children, higher levels of pretend play were associated with higher scores in emotional competency. Emotional competency was measured through scores of emotion understanding (children were asked to describe how a person in a picture felt or to point to the happy person) and emotion regulation (teacher and parent questionnaires) (Lindsey & Colwell, 2003).

Play and Coping

Play has also been found to help children cope through stressful situations by allowing children to express their fears, misconceptions, and anxieties in their own way, both verbally and nonverbally (Clatworthy, 1981). For example, a study examined how 120 children (ages 4 to 11 years) coped with feelings of sadness. During an interview, the children were asked, "What's the thing to do when you're feeling depressed/unhappy?" Seventy-seven percent (n = 92) of the sample replied with an answer of some form of play (Kenealy, 1989). In a more recent study, the

coping strategies for hospital related fears were examined in a group of preschoolers (4 to 6 years old). Thirty-four of the children were hospitalized while 48 were recruited from a preschool setting. Semi-structured interviews revealed that, overall, preschool children prefer coping strategies in which they are actively involved, such as play. In addition, the hospitalized children stated play as a coping method significantly more often than the non-hospitalized children (Salmela, Salantera, Ruotsalainen, & Aronen, 2010).

Research on which qualities of play help children cope with stressful experiences also have been conducted. For example, in one study, 40 children (ages 3 to 5 years) randomly were selected from a preschool setting and assigned to either an ambiguous ending (experimental group) or a happy ending (control group) condition. The experimental group watched a *Lassie* movie in which the dog and his owner experienced a fall and are left helpless. The movie ends with no description of the dog or the owner's fate. The control group watched the same movie but with an extended ending showing the dog and owner safely recovering. Pre and post anxiety measures were taken through self-reports and behavioral assessments. After watching the movie, the children participated in ten minutes of play with toys including a *Lassie* animal, a stuffed cat, Play-Doh, a puzzle, and a construction kit to assess the types of play within both groups. The anxiety levels of children in the experimental group were significantly higher than the control group after watching the video. Interestingly, the children in the experimental group played significantly longer with the Lassie dog (both alone and with another toy) than those in the control group. Finally, the experimental group reported significantly less anxiety after the play session than before the play, while those in the control group's level of anxiety remained the same (Barnett & Storm, 1981). The difference in anxiety level found after the play session in each group was likely due to the finding that children in the experimental group were anxious

before play while those in the control group were not, suggesting that knowing the outcome of an event minimizes anxiety. These findings also suggest that play helps children in stressful situations by reducing anxiety and that playing with something related to the cause of anxiety may help to reduce the anxiety.

These findings were supported by a later study that examined the effects on play in reducing anxiety in anxious versus non-anxious preschoolers. Children were rated as anxious or non-anxious based on their behaviors during an episode of separation from their primary caregiver. Participants were randomly assigned to a play group that participated in free play or a control group that listened to a story. The anxious children in the play group reported less anxiety after participating in the play compared to those anxious participants that listened to a story (Barnett, 1984). Play appears to help children cope with their stressors and anxieties.

Moore and Russ (2006) describe two approaches to explaining how play helps a child cope during times of stress: emotion regulation and cognitive behavioral. In emotion regulation, a child can utilize play to act out the intensity of emotions associated with stressful situations without having to actually feel the intense emotions, as often seen in pretend play. In addition, in play, a child can express the emotions in smaller, more feasible, pieces rather than all at once. In the cognitive behavioral approach, a child can experience the stress through play and become cognitively habituated to the emotions, allowing the child to begin to experience the stress without being overwhelmed (Moore & Russ, 2006).

Play interventions with a cognitive behavioral theory background are interested in a child's feelings and emotions associated with a particular event, such as separating from a parent, and how to teach a child, in developmentally appropriate terms, to cognitively recognize those emotions and adjust them to allow for better coping. This can be accomplished through

modeling and systematic desensitization (Knell, 1998). Through play with puppets, games, books, and dolls or figurines, a child can express their emotions associated with a stressful event (e.g., “Mommy is never going to come back”); then, the play item (i.e., puppet, book, etc) can model appropriate responses to the stressor (e.g., “Mommy loves me and will be back soon”). Through such play, the adaptive behavior should become internalized over time and the child’s response to the stressor changed. In systematic desensitization, a person learns to associate something that causes anxiety with something that is relaxing and happy. For children, the one thing that does not involve fear or other anxieties is play. Cognitive behavioral therapies, therefore, promote children to play out the emotions of a stressor, such as a friend taking a favorite toy. In this example, a child’s response to the stressor may be to hit and kick their friend who took the toy. In play, children are allowed to work through such emotional responses and master the emotions. Cognitively, the child would then associate the stressor with more positive emotions due to the sense of mastery through play, thus changing their response to a more adaptive one (Knell, 1988). Play can certainly allow for children to cognitively cope with stressful situations.

Play also provides children with a sense of control in a stressful setting (Webb, 1995). Control is a necessary component for positive emotional well-being. In the medical setting, children often lose a sense of control as the environment is acting on them. For example, they are having a procedure done on them or parents are deciding with the doctors and nurses on a medical plan with little input from the children. Children may not be able to control the stressful event, but they can choose what item to play with, and how to play with that item, which gives them some sense of control.

Bettelheim (1987) summarized the importance of play: "the child's play is motivated by inner processes, desires, problems, and anxieties…. Play is the royal road to the child's conscious and unconscious inner world" (p. 35). Evidence of this is described in a collection of play observations by professionals working within the medical setting (Oremland, 1988). Child life specialist, developmental literature, and child life students in training described how children within the medical setting use play to master development and critical experiences. The following is one observation provided:

> An older child responded to manifestations of her illness in her design of a Christmas card. It depicted a remarkably asymmetrical Christmas tree and a house with smoke drooping down one side of the chimney. She seemed to have no awareness that she was representing her one-sided facial paralysis (p. 151).

A first-hand observation such as this describes how children utilize play to project the emotions and anxieties associated with stressful situations. Adults may, by observing children's play, gain insight into the conscious and unconscious thoughts of children.

Play is a primary source of coping for children encountering a medical experience (Bolig, 1990). One study explored how hospitalized children played compared to non-hospitalized children. The hospitalized children were preschoolers with leukemia and the comparison group was healthy preschoolers. Play sessions were observed four days a week for six weeks at an outpatient clinic for the leukemia patients and a child care program for the comparison group. Results showed that the children with leukemia participated in fewer play activities than the healthy children. The children with leukemia also engaged in the same types of play (i.e., the same toys) week after week even when new play opportunities were presented. Apparently, the leukemia patients' play became ritualistic. Perhaps, through their ritualistic play behaviors they

developed a routine that helped them cope during the stressful situation. The use of familiar toys provided as sense of mastery and enhanced coping (Gariepy & Howe, 2003). Findings such as these illustrate how children may utilize play to help them cope.

Child Life Play Styles

Child life specialists utilize three types of play in the medical environment to enhance positive coping in children: normative, medical, and therapeutic. *Normative play* is a spontaneous activity that a child actively engages in and finds pleasure doing (Vessey & Mahon, 1990). Examples include reading books, playing board games, participating in arts and crafts, and engaging in pretend play. *Medical play* allows for non-directed play and exploration involving a medical theme, such as medical collages (McCue, 1988). Non-directed play allows the child to take the lead; the child, not the adult, decides what to play with and how to play with the item(s). For example, in medical collages, materials are presented to the child, such as construction paper, crayons, scissors, Band-Aid, gauze, tongue depressors, and other medical items, and the child decides what to do with the items presented. They can utilize any of the items of their choice in any manner that they would like to create a collage. *Therapeutic play* are activities designed and implemented to help a child think through difficult events, such as a medical encounter, while promoting typical development (Koller, 2008). An example of a therapeutic play activity would be a writing activity designed to allow the child to express his/her fears about undergoing a medical procedure.

Medical Play

Medical play is a common technique used by child life specialists to reduce anxiety and promote children's coping with medical visits, hospitalizations, and procedures. In medical play, children are provided the opportunity to play with, and explore, common medical supplies (e.g.,

tongue suppressors, stethoscope, thermometers, etc.,) they may encounter with the expectation that by becoming familiar with these, children will minimize their anxieties of these supplies when they are used on them. Medical play has four components (McCue, 1988). First, a medical theme or medical equipment is always used. Second, medical play may be initiated by an adult, but it is child-directed and always continued by the children engaged in the play activity. Thirdly, it is presented as a fun activity. Finally, medical play attempts to help children gain mastery and control, express emotions, and explore their fear of medical supplies and equipment. The benefits of medical play include addressing misconceptions, distinguishing between reality and fantasy, expressing fears, concerns, and anxieties, and increasing children's understanding of medical experiences (Webb, 1995).

Medical play is a more structured form of play. Child life specialists usually have a goal in mind when a medical play activity is set up. Medical play sessions are more structured to allow for the initiation of play and the engagement of children, but once it is started, the children lead the play session (Bolig, Yolton, & Nissen, 1991). For example, a child life specialist may design an art activity to familiarize a new patient with syringes. The specialist would place materials out that would facilitate this activity such as water paint, paper, syringes, stickers, and markers. The specialist would likely make this the playroom activity of the day to engage the children, demonstrate how to use the syringe, and continuously ask questions about the syringe to keep the children engaged and assess their fears and misconceptions. However, the children would decide how to use the syringe, what to paint, what to talk about, and how long to participate in the art activity. Child life specialists are trained to recognize the fine line between play and non-play behaviors. Play activities would be spontaneous and under the lead of the children, deciding what to play with and how to play with it. Non-play behaviors would be

responses by the children to structured activities in which they were instructed on something and directed on how to approach the situation with limited input. This knowledge allows child life specialists to let the children lead the activity and recognize that a medical play session cannot be too structured with questions, limited options, and strict directions. If such limitations were experienced, play will be less likely to occur. Medical play requires children to be active and the adult to be responsive (Bolig, et al., 1991). By being responsive, the adult can hear and interpret the children's actions and thoughts and provide feedback with a goal in mind to minimize fears and anxieties while promoting mastery and coping.

When a child life specialist utilizes medical play as play therapy, several guidelines must be followed to ensure the most benefits for the specialist and child. Virginia Axline (1969) outlined the eight principles for a trained professional, like a child life specialist, to implement during a play therapy session. The principles are as followed: 1) develop a friendly relationship with the child and establish rapport quickly, 2) accept the child as is, 3) create an environment of permissiveness so that the child feels able to express himself/herself, 4) be alert to the child's feelings and express them back to the child in a meaningful way so that the child gains insight, 5) maintain respect for the child's abilities to solve his/her own problems and give them the opportunity to do so, 6) let the child's behaviors and conversations lead the session; do not direct the child in what to say or do next, 7) let the child determine the pace of the session and do not hurry it along, and 8) establish only limitations that connect the child to reality and remind the child of his/her role in the play session.

Child life specialists have an important role in facilitating play in the medical setting. Supervised play in the medical setting has been found to promote exploration of toys, encourage the expressions of fears and emotions, and support play between children and families.

Supervised play has also been found to increase parent and child interactions and decrease negative behaviors from children, such as screaming (Hoffman & Futterman, 1971; Williams & Powell, 1979). Ispa, et al. (1988) examined the effects of supervised play versus non-supervised play in a pediatric outpatient neurology clinic. Thirty children, ages 5 to 10 years, were observed to examine their anxious and anger/compliance behaviors for two, five-minute play experiences. For half of the children (n = 15), the play was supervised by a child life specialist or a child life student in training, while the other half of the children (n = 15) participated in non-supervised play. Children who participated in the supervised play displayed significantly less anxiety than those in the non-supervised play. In addition, a trend for more compliant behaviors was found in the children in the supervised play group (Ispa, et al., 1988). These results suggest play within the medical setting, supervised by a trained adult, such as a child life specialist, may increase children's coping.

Child life specialists utilize several different types of medical play when working with children and their families. *Role rehearsal* occurs when children play the role of a health care provider and act out a procedure using a puppet, doll, or stuffed animal as the patient. *Indirect medical play* allows a child to explore and become familiarized with medical equipment and supplies in a more structured manner. This can involve songs and games with a medical theme (i.e., hospital bingo or syringe water guns). In addition, *medical art* is another type of medical play in which an art activity utilizes a medical theme, such a medical collages or syringe painting (McCue, 1988).

To describe how medical play works, role rehearsal is further described. As stated before, role rehearsal occurs when children play the role of a health care provider and act out a procedure using a puppet, doll, or stuffed animal as the patient (McCue, 1988). Authentic, safe

medical equipment is used (e.g., plastic thermometer, stethoscope, etc). Role rehearsal may be initiated by the adult who then encourages the child to engage in playing with the equipment without the adult directing the child. Because medical play is child-directed, that is the child takes the lead in how to play with the equipment, children often perceive themselves as in control and gain confidence, which results in children being able to share their thoughts with the child life specialist. For example, children sometimes displace their emotions or fear of what will happen to them with the medical equipment onto the doll or puppet (e.g., "Here dolly, this shot is going to hurt you and suck out your blood!"). This forum provides the child life specialist the opportunity to identify misconceptions and fears so that children may more accurately process the information (e.g., "Did you know a shot does not suck out your blood? It actually puts medicine into your body that will make you feel better or protect you from getting sick.").

The use of medical play in a hospital setting is described in a study that explored long-term chronically ill children's' play. In that study, 2-to- 6 year olds with a chronic illness were provided with a play kit that included familiar items, such as crayons, dolls (baby, girl, boy, mother and father), gun, baby bottle, and car, and hospital equipment, such as Band-Aids, thermometer, syringe, hospital dolls (doctor and nurse), gauze, and medicine bottles. A 45-minute medical play session was held every 5 to 10 days until the child was discharged or until the child participated in 49 sessions. A researcher introduced the toys to the children, facilitated play when necessary, and recorded the children's behaviors during play. Ninety percent of the children acted out a medical procedure (injection (55%), medication giving (23%), temperature taking (17%) and tube-feeding (4%)) at least once, and half of the children played out a medical procedure more than 25% of the time. Injections were the most frequent intrusive procedure displayed in play, and the children were more exploratory in play with injection materials (more

likely to push the syringe up and down than to use the syringe on a doll in the correct manner), suggesting a degree of threat was present in these materials. Overall, the children were accurate in procedure depicted in play and used verbalizations through commentary and role rehearsal (Ellerton,Caty, & Ritchie, 1985). Such findings suggests that children have concerns about such procedures and can benefit from medical play to help them express fears and cope effectively, even with repeated and frequent exposure to medical procedures, such as injections.

In another study, the frequency of medical play was examined during a free play session in non-hospitalized pre-school children. The study revealed that during a 30-minute free play session, the pre-schoolers were just as likely to play with medical supplies, such as band-aids and tongue depressors, as they were to play with developmentally appropriate toys. Interestingly, the play with medical supplies was much shorter than the typical play and children with previous hospital experience (primary or secondary) spent less time engaging in medical play than children with no previous hospital experience. Children with no previous hospital experiences were also more exploratory in their play (e.g. more likely to use a syringe to suck up water and then expel it) (McGrath & Huff, 2001). These findings suggest that children with hospital experience may have residual anxiety about medical equipment. If children can learn to approach medical material, and gain a better understanding of their purpose with the appropriate guidance of a Certified Child Life Specialist, will this help reduce children's anxiety during actual medical procedures?

Few studies exist in the literature on the effects of medical play on children's coping with actual hospital procedures, or on the effects of medical play for reducing children's anxiety related to medical procedures. One study examined the effects of medical play on the stress of children receiving minor surgery (Burstein & Meichenbaum, 1979). In this study, children who

played with medical-themed toys before surgery displayed less distress post-surgery than children who avoided the medical-themed toys. These findings suggest that children who engage in medical play may experience reduced post-procedure anxiety. However, these finding must be interpreted with caution because the frequency of medical play and post-procedure anxiety were not directly examined and there was no control group.

In another study, the effects of a role rehearsal technique, “The Teddy Bear Hospital”, on future hospitalizations was examined in a group of preschool children (Bloch & Toker, 2008). “Teddy Bear Hospital” involves children bringing a teddy bear or stuffed animal to a hospital or doctor's office on a designated day. The teddy bear will go through a typical admission process that a child would go through if being hospitalized (e.g., identification bracelet is provided, temperature and vital signs are taken, etc.). This familiarizes children in a non-threatening manner with the many different aspects of medical encounters they might experience if they were hospitalized. As with medical play, a goal of “The Teddy Bear Hospital” technique is to minimize children’s fears and misconceptions about medical, or more specifically, hospital environments. In the Bloch & Toker (2008) study, 41 preschool children visited the “Teddy Bear Hospital” prior to being hospitalized, and 50 children were placed in a matched control group who did not receive the intervention. Children in the intervention group displayed significantly lower anxiety than the control group measured by a one-item visual scale of anxiety. These findings are encouraging and suggest that medical play may benefit children encountering medical procedures.

In sum, a literature search revealed few scholarly articles on medical play. The few articles that were found spread across four decades (1979-2010) and are methodologically flawed (e.g., no control group, no randomization or replication, etc.) The value of medical play is

minimally supported by scientific evidence in the literature; however, it is commonly used by child life specialists in medical settings. There appears to be a large gap between what professionals are using to help young children and their families to cope and what is empirically supported. This gap in the literature needs to be filled and requires additional studies to more thoroughly examine the efficacy of strategies like medical play in helping children cope with medical procedures and settings.

Purpose

This study will examine the effects of medical play versus other play activities, for minimizing anxiety, fear, and procedural distress in school-age children attending a doctor's appointment at a general medical school pediatric clinic. This study will begin to fill the gap in the medical play literature by empirically examining the effects of play for reducing children's anxiety when visiting a doctor. Other studies have looked at medical play for children receiving surgery, for children in outpatient clinics, or for non-hospitalized children, but no study was found that has looked at the effects of play for reducing children's anxiety at a pediatrician's office or clinic. Also, it is unclear if medical play is more effective than typical play at reducing anxiety in children undergoing medical procedures as no study was found that compared different types of play. Finally, the proposed study will examine, if medical play is more effective at reducing anxiety and fear than typical play, what component of medical play makes it more effective (the hands on manipulation of the medical supplies or just an observation of the supplies). In the literature, no study has empirically examined what makes medical play effective.

Hypotheses

This study examined the following hypotheses:

Ho1: Children who participate in medical play before a doctor's visit will display less anxiety, fear, and procedure distress than children who participate in typical play, view a taped medical play session, or watch a video about safari animals.

Ho2: Children in the medical play group will display less anxiety, fear, and procedure distress than children viewing a taped medical play session, suggesting that it is the hands on manipulation of the medical materials that minimizes anxiety, fear, and procedure distress in children going to visit a doctor.

Ho3: Children who participate in a typical play activity will display less anxiety, fear, and procedure distress than children who watch either a taped medical play session or watch a video about safari animals.

Ho4: Children who view a medical play session video will display less anxiety, fear, and procedure distress than children who watch a video about safari animals.

Since it is possible that any activity performed with young children prior to the pediatrician's visit may be effective in reducing children's anxiety and distress, this study was designed to measure the effects of a medical play session as compared to a typical play session or a video session. A strength of this study is that it addresses methodological problems seen in previous studies. By having an intervention group (medical play) and three control groups (typical play, medical information video, and safari video), it is possible to examine if medical play is superior in reducing children's distress in comparison to another type of play or activity.

METHODOLOGY

Participants

The study comprised of 72 caregiver-child dyads (72 caregivers and 72 children). The children (n= 33 males) were attending a scheduled, or walk-in, doctor's appointment at a general medical school pediatric clinic. Ethnicity was distributed with 50% (n=36) being African American, 46% (n=33) being Caucasian and 4% (n=3) being biracial. The children's ages ranged between 5 and 12 years (*M*=8.41, sd =1.92). Twelve children reportedly were diagnosed with a special need, including ADHD (n = 8), language delays (n = 1), developmental delay (n = 1), and multiple needs (n = 1). One parent reported the child to have a special need diagnosis but did not list the diagnosis. The caregivers' ages ranged from 23 to 65 (mothers' *M*=36.54, sd = 9.02, fathers' *M*=39, sd = 8.62), and the families were predominantly middle-to-low in socioeconomic status according to the Hollingshead two-factor index.

Forty-two percent of the participants had been previously hospitalized. Reasons for previous hospitalizations included surgery (n = 11), respiratory care (n = 6), emergency care (n = 5), treatment for infections (n = 4), and psychological care (n = 1). Twenty-eight of the children had previously experienced medical procedures, including surgery (57%), diagnostic scans, such as an X-ray or EEG, (36%), respiratory treatment (4%), and blood work (4%). According to parental reports, the children's reasons for visiting the pediatric clinic at the time of data collection included: ill checkup (58%) and general checkup (39%). Three percent of the parents did not report the reason for the doctor's visit. Ninety percent (n= 65) of caregivers reported talking to their child about the doctor, suggesting that a majority of the child participants had

some knowledge or awareness of their visit to the medical doctor.

Procedure

A researcher with knowledgeable experience in the child life field approached the caregivers of the pediatric patients in the clinic's waiting room, explained the study purpose and procedure, and obtained informed consent. After the caregivers consented, the children were informed of the study and if they agreed, asked for verbal assent (5 -6 years of age) or asked to sign an assent form (7-12 years of age). The inclusion age criterion was between 5 ½ and 12 years of age. Children with severe cognitive (e.g., Down syndrome) or physical disabilities (e.g., broken arm, cerebral palsy or spinal cord injury) hindering them from understanding or participating in the study were excluded.

Child participants were randomly assigned to one of four groups: 1) a medical play group, where children were given a doll and authentic medical equipment, 2) a medical information video group, in which children were shown a taped medical play session, 3) a typical play group (i.e., played Connect Four), or 4) a control group whose participants viewed a video on safari life. Assignment to groups was determined using random sample numbers generated by a computer software program (Urbaniak & Plous, 2010).

Once assented, a researcher led the child participants to a research area away from the waiting room of the clinic to minimize distraction from other activities or children. On the days of recruitment, a large exam room was reserved for the administration of the group activities. The exam room was a typical clinic exam room with a bed, chair for a sitting visitor, and storage space for medical supplies. One wall of the room was painted in a sports mural (i.e. soccer player on field) in order to make the room more patient-friendly. Child participants were led into

the room and placed facing the sports mural to minimize the children's awareness of the medical setting. All activities were held in the same exam room to control for environment.

Once in the exam room, the children were asked to describe how they felt by pointing to one of several expressive faces on a page (from happy to fearful) as an indicator of their fear. A researcher took the children's pulse as an indicator of their anxiety. The children then participated in their assigned group activity as described below. After the activity, the child participants were asked again to describe how they felt by pointing to their picture, and their pulse was again taken. After being called back by a nurse, the children underwent triage procedures (weight, height, blood pressure, and temperature). Consented nurses completed a behavioral assessment scale of the children's distress level during the triage procedures. A researcher, blind to the children's group assignment, rated the children's affect and behaviors before the assigned activity, during triage, and after the doctor's visit. After the doctor's visit, the children were asked to report how they were feeling by pointing to the picture for a final time, had their pulse taken, and were asked to draw a picture of a person visiting the doctor as a post-measure of anxiety.

Parents completed a background questionnaire and an interview about their children's developmental abilities while the children were participating in assigned group activities. The developmental interview was administered to the parent by a researcher blind to the children's group assignment. After completing the activities, the children returned to the waiting room with the parent until they were called for their appointment.

Groups

Group assignment was followed to determine if anxiety, fear, and procedure distress could be minimized by participating in a medical play group, viewing a medical information video, participating in a typical play group, or viewing a non-medical information video.

Medical Play Group

Children assigned to the medical play group (n=18), were given a large, gender neutral, multicultural doll and a few safe medical items that are common to a medical visit. The medical items included a stethoscope, otoscope which is used to look in ears, blood pressure cuff, gloves, a tongue stick, Band-Aids, gauze, a syringe without a needle, and a reflex hammer. A researcher, a Certified Child Life Specialist, presented the doll and medical equipment to the child and engaged the child participant by saying, "This is my medical buddy (pointing to the doll) and here are some tools a doctor sometimes uses. Let's pretend like we are the doctor and play with the tools on the medical buddy. What do you think this does (pointing to a medical tool)." The play then became child-directed allowing the child to manipulate the medical tools in any way to familiarize them with items they were likely to see in their doctor's visit that day. The researcher sat by the child and continued to facilitate play when necessary by redirecting the children to the tools and dolls ("What do you think this does? Do you want to try it out on the medical buddy or me?"). In addition, the researcher addressed questions, concerns and misconceptions that the children expressed (If a child said, "This, pointing to the otoscope, is used to look into your brain, the researcher would reply, "Actually, that is used to look into your ear. The doctor puts this part in your ear and looks through this part to see how your ear is doing or if it is sick.").

Medical Information Video Control Group

Children assigned to a medical information group (n=18) were shown a video of a child engaged in medical play. There were two available medical play videos: one of a five-year-old participating in medical play for participants ages 5 ½ to 7 to view and one of a ten year-old participating in medical play for participants ages 8 to 12 to view. Once in the research area, the children were introduced to the video by the researcher (i.e. "Today we are going to watch a video of a child your age playing with a medical buddy and some medical tools you may see in your doctor's visit). The video showed a pre-recorded medical play session, like the medical play group of this study. A doll (medical buddy) and the same authentic medical tools from the medical play group were presented to the child in the exact same manner as they would be to the medical play group. The purpose of this group was to provide the participants with the same level of information found in medical play while not allowing for hands on manipulation of the materials. The researcher showed the medical play video on a laptop computer with headphones to minimize outside distraction. To minimize the effect of additional information, the researcher did not discuss medical information with the children. This procedure was followed to determine if anxiety, fear, and procedure distress could be minimized by merely viewing a medical play video-taped session.

Typical Play Group

Children assigned to the typical play group (n=18) were invited by the researcher to play Connect Four (Milton Bradley), a game in which two players take turns placing their color token into a grid to get four tokens in a row. The researcher talked to the child participants throughout the activity about their interests, school, and family.

Non-Medical Information Video Control Group

Children assigned to the control group (n=18) watched an age appropriate educational video on a laptop computer in the designated research area. The video was entitled, "Animal Atlas: Animal Passport" (Midori Entertainment, 2008) and reviewed the life of African safari animals in a developmentally appropriate manner for children ages 5-12.

Assessments

Parent Scales

1) Background/Demographic questionnaire. The *Background questionnaire* was comprised of the following questions: the child's age, gender, ethnicity, diagnosis of special needs, and information regarding medical experiences, including reason for the pediatric visit, number of previous hospitalizations, type of medical procedures the child has experienced, and knowledge of pediatric experiences (Do you talk to your child about going to visit the doctor?"). The questionnaire also asked the parent to report how worried they were about their child's doctor's visit, and how worried they felt their child was about the doctor's visit (none, a little, a lot). Parents were also asked about their age, highest grade completed (ranging from under 7 years to Professional (MA, MS, MD, PhD, etc), living arrangements (living with spouse, living with family members, etc), and occupation to compute socioeconomic status based on the Hollingshead two-factor index (Hollingshead, 1975).

2)Developmental profile 3 (DP-3; Alpern, 2007). Some children attending the Pediatric Clinic have special needs and/or developmental delays. The scores obtained in the *DP-3* allowed the researcher to see the developmental ages of the children. The Child Drawing: Hospital assessment is scored according to the child's age. A child's chronological age does not always match his/her developmental age; therefore, it was necessary to determine participants'

developmental age in order to score all aspects of the study in a meaningful way. The *D-P3*, a norm-referenced developmental screening instrument, was used to assess the children's developmental level.

The researcher administered the DP-3 through a structured parent interview. The researcher asked the parent about the child's developmental abilities in the following domains:

- Physical: Fine and gross motor skills, strength, stamina, flexibility, and sequential motor skills.
- Adaptive Behavior: Ability to eat, dress, function independently, and utilize technology.
- Social-Emotional: Interpersonal abilities, emotional needs, and how the child relates to friends, relatives, and other adults.
- Cognitive: Skills necessary for being successful in academic and intelligent functioning.
- Communication: Expressive and receptive communication skills, both verbal and non-verbal.

For each domain, the researcher asked the parent questions (e.g.," Does the child walk on tiptoe for at least 10 feet without heels touching the ground?") and prompted the parent to respond with a yes or no. The researcher provided more information about each question if the parent needed further clarification. The researcher asked as many questions in each domain as necessary until the parent responded with 5 no's in a row, or the last question in each domain was asked indicating a ceiling level was reached.

Scoring of the *DP-3* involved calculating raw scores for each developmental domain, which were then converted to standard scores, percentile ranks, and age equivalents. Raw scores were calculated by summing the number of yes responses in each domain. Yes responses scored

a 1 and no responses scored a 0. Raw scores for each domain were then converted to a standard score using a conversion table provided by the *DP-3* manual. The standard scores were interpreted using a mean of 100 and a standard deviation of 15. A standard score of one standard deviation above or below the norm was considered average and a score two standard deviations above or below the norm was considered well above average or delayed, respectively. Raw scores were also converted to age equivalents using a conversion table in the *DP-3* manual. The age equivalent scores suggest the age with which a child's raw scores are average of children's ages in a standardized sample. Percentile ranks were also examined using the standard score to see the percentage of normalized children that performed lower than the child evaluated in the interview. A general development score was determined by summing all five of the standard scores. This sum was converted to a general development score using a conversion table provided by the *DP-3* manual.

Alpha coefficients showing internal reliability were reported as following for the five scales: .93 for physical, .91 for adaptive behavior, .89 for social-emotional, .91 for cognitive, and .90 for communication. Test-retest reliability for a two-week interval ranged from .81 (social-emotional) to .88(cognitive) correlations suggesting the questionnaire has good reliability over time. Correlation coefficients between the DP-3 and the Developmental Assessment of Young Children ranged from .64 (adaptive behavior) to .72 (general development score) providing evidence for construct validity (Alpern, 2007).

Child Scales

1) The child drawing: Hospital. After completing their doctor's visit, the children in the study were asked to, "Please draw a picture of a person visiting the doctor." In this projective measure, the child was given an 8 ½ by 11 inch sheet of white paper and a box of crayons, which

included the 8 basic colors. The children were instructed that the drawing would be given to the researcher as part of the study. The researcher handed the piece of paper to the children at an angle for the children to determine the placement of the drawing on the paper. The paper was purposely handed at an angle so as not to bias the children on how to place the paper when drawing. In addition, the researcher did not instruct the children on what to draw to minimize influence. The children had as much time to complete the drawing as needed. The researcher discussed the drawing with the children while they were drawing to build rapport and enhance content validity. Once the children finished with the drawing, it was returned to the researcher who documented on the back of the drawing the participant number, age, and gender. The researcher also provided notes on the drawing to assist during scoring.

Evidence supports the use of drawings as a mean to examine the emotional status of children in life situations (Loxton, 2009). In this study, the children's drawings were interpreted for anxiety using the Child Drawing Hospital Manual (Clatworthy, Simon, & Tiedeman, 1999b). The manual has been used across varied hospital settings and ethnic groups (Clatworthy, Simon, & Tiedeman, 1999a; Wennstrom, Hallberg, & Bergh, 2008).

The drawing is scored in three parts and includes a total. Part one consists of 14 items related to the person in the drawing, including: position, action, length and width of person, placement, eyes, size of person, use and number of colors, presence of hospital equipment, developmental level, strokes quality, use of paper, and facial expression. The rater determined an item score for each of the 14 items on a scale from 1 to 10 with a score of 1 reflecting the lowest anxiety. For example, on the item length of person, the researcher looks at the size of the person in relation to the rest of the drawing. An item score of 1 would have a drawing in which the person is tall as seen by the figure occupying all or almost all of the paper. An item score of 10

would be a drawing in which the person in it had no body at all but was just a floating head. A child with a lot of anxiety would draw a tiny person or a person without a body. T*he Child Drawing: Hospital Manual* (Clatworthy, et al., 1999b) provides detailed instructions and images on how to score each of the 14 items of part one of *The Child Drawing: Hospital Scale*. Scores on part one can range from 14 to 140.

A second pass of the drawing, for part two, included scoring for the presence of pathological indices including: omission of one body part, exaggeration of a part, de-emphasis of a part, distortion, omission of two or more parts, transparency, mixed profile, and shading. The presence of any of these indices is an indicator of high anxiety. In part two, if a drawing had an omission of one body part (only one leg), exaggeration of a part (a hand of the person drawn really big), or de-emphasis of a part (a foot of the person drawn really small), then the presence of each individually was scored 5 points. Ten points were added to the score in part two for the individual presence of each of the following: distortion (misshaped body), omission of two or more parts (two legs missing on the person or one arm and one leg missing), transparency (organ drawn showing through the skin), mixed profile (adding an extra set of facial features after the age of 10), and shading (coloring over a part of the drawing other than clothes or skin). Scores on part two can range from 0 indicating a child did not draw any of the pathological indices to 60.

Part three is a gestalt rating, 1 to 10, of the rater's sense of anxiety depicted in the children's drawing. A lower score suggests lower anxiety and better coping. A drawing with a score of 1 would be well-proportioned, use many colors, use bright colors, and include happy faces and confidence. A drawing with a score of 10 would be disorganized, odd, use dark colors, and include sad, overwhelmed, and defeated faces.

A final score was determined by summing the scores on the three parts. The total score was associated with a level of anxiety in the children and a suggested intervention. See Table 1 for more information on the range of total scores associated with the different levels of anxiety. Scores range from 15 to 210 with the larger score indicating larger child anxiety. The drawings were scored without any knowledge of the children's group assignment. Inter rater reliability was determined using Spearman's correlation for 7 of the drawings and reached 0.92 between two raters.

Table 1

Level of Anxiety Based on Child Drawing: Hospital (CD:H) Total Scores

CD:H Total Score	Level of Anxiety
Less than 43	Very Low
44 to 83	Low
84 to 129	Average
130 to 167	Above Average
Above 168	Very High

Internal reliability for the scale has been determined using Pearson correlations for the scores between part one, part two, and part three. The correlations (.18 to .78) were found to be significant (r = 0.97, p<.001) (Clatworthy, et al., 1999a). Farquhar (1983) examined the validity of the Child Drawing: Hospital (CD:H) by comparing the mean scores of anxiety in a sample of hospitalized children to those of a sample of non-hospitalized children on the CD:H and the Missouri Children's Picture Series scale (MCPS), another drawing measure of anxiety. A significant difference was found between the anxiety level of hospitalized children (M=406.83) and non-hospitalized children (M=396.68) on the MCPS (p <.001) with the hospitalized children having higher anxiety. A significant difference of anxiety level was also found between the

hospitalized children and non-hospitalized children on the CD:H ($t(_{299})$=6.84, p,.001). Therefore, the manual has acceptable validity and reliability (Clatworthy, et al., 1999a).

2) Fear Scale- This self-report measure was created for this study to assess the level of fear the children were presently experiencing at the time of recruitment. The children were shown a scale of five facial expressions that vary from happy and calm (1) to very scared (5) and asked to "Point to the face that looks like how you feel right now." In order to evaluate the validity of the scale, participants were then asked to describe their chosen face ("Can you tell me about that face?"). This allowed the researcher to determine if the faces the children chose were actually the emotion the researcher was depicting in the scale. The children were asked to complete this scale three separate times: before and after the play or video activities, and after the doctor's visit.

The scale was scored as followed: 1) a 1 was given when the children pointed to the "very happy" face (large smile and dimples), 2) a 2 was given when the children pointed to a "happy" face (small smile), 3) a 3 was given when the children pointed to the "neutral face" (straight mouth), 4) a 4 was given when the children pointed to the "concerned" face (open mouth with no face tension), and 5) a 5 was given when the children pointed to the "fear" face (large open mouth with face tension). Higher scores suggested fear in the child participants. Lower scores suggested happiness and calmness in the child participants.

Because the Fear Scale was created for the purpose of this study, the validity of the scale had not been assessed. However, this scale is very similar to another standardized scale used to assess pain in children, the FACES Pain Rating Scale (FACES; Wong and Baker, 1988). The FACES consists of six faces that range from a big smiling face (no pain) to a very tearful face (worst pain). Children are asked to point to the face that best describes their pain. One study

examined the validity and reliability of the FACES. The FACES was compared to the Word Graphic Scale, another pain assessment scale. A significant Pearson correlation was found between the two pain assessments ($r = .71$, $p > .01$, $n = 118$) suggesting the FACES is a valid tool to measure pain. Reliability was also confirmed by comparing the score of a population of children immediately after a procedure to their score 15 minutes after the procedure. A significant correlation was found between the test and rest scores ($r = .90$, $p > .001$, $n = 118$). In addition, the FACES was reported to be the pain scale preferred by children (Keck, Gerkensmeyer, Joyce, & Schade, 1996).

Researcher Scales

1) Behavior observation scale (BOS). A research assistant (blind to the children's group assignment) assessed the children's behavior before the play or video activities, during triage, and after the doctor's visit. Specifically, the researcher observed the children in real time and rated the children's: a) State on a scale of 1 (active alert), 2 (inactive alert), or 3 (drowsy); b) Affect on a scale of 1 (positive), 2 (neutral), or 3 (negative/flat); and c) Activity, Vocalization, and Fidgeting Behaviors, each on a scale of 1 (high), 2 (moderate), or 3 (low). Scores for fidgeting were reverse scored, and lower scores for all five variables were more optimal.

Each item of the scale was scored individually based on the above scale to determine how the different groups' behaviors varied throughout the study. For example, one would think that children with high anxiety, fear, or distress would have an active alert state, negative or flat affect, and high activity, vocalization, and fidgeting. It was expected that children in the medical play would have less behaviors associated with anxiety and fear than those in the other groups after the doctor's visit.

2) Heart rate. The researcher measured the children's pulse as an indicator of anxiety, with higher anxiety reflected as higher pulse. The normal resting pulse rate for children between the ages of 6 and 15 is 70 to 100 beats per minute (The Cleveland Clinic, 2010). Before the activity, after the activity, and immediately after the doctor's visit, pulse data were collected by the researcher, by placing two fingers on the radial artery of the children and counting the number of beats for thirty seconds. The number of beats is multiplied by two to determine the beats per minute. The researcher informed the children what she was doing by stating, "I am going to place these two fingers right here on your wrist for thirty seconds." Children in the medical play group were expected to have a lower pulse than children in the other groups, post activity and doctor's visit, suggesting that medical play lowered anxiety.

Nurse Scale

1) Nurses' rating of children's distress scale. Prior to seeing the doctor, the nurses brought the children in for triage. During triage, the nurses measured the child participants' height, weight, and blood pressure. After completing the triage, the nurses (blind to the children's group assignment and/or hypothesis of the study) rated the following items: 1) the children's level of overall stress on a scale of 0 (very relaxed) to 5 (very tense), 2) overall level of pain on a scale of 0 (no pain) to 5 (very high pain), and 3) overall difficulty during the examination, using a scale of 0 (very easy) to 5 (very difficult). The nurses also circled the behaviors that the children displayed during the triage, including: no cry to screaming (cry), smiling to grimace (facial), positive to other and pain complaint (verbal), neutral to restrained (torso), no touching to restrained (touch), and neutral to restrained (legs).

Scores for the first part ranged from 0 to 5 for each of the three questions (children's overall stress, pain, and difficulty). Lower scores were more optimal, suggesting less distress.

The second part of the scale is part of the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS; McGrath, et al., 1985). This scale is used to code the distress behaviors of children before and after medical procedures. Previous studies report a strong correlation between the CHEOPS and nurses self-report scores of patient pain (r = .91) (McGrath, et al., 1985). The behaviors the nurses circled were coded according to the score associated with the behaviors (as seen in table 2). This provided six individual scores ranging from 0 to 2 and 1-3 and a total score ranging between 4-13. Lower scores suggested lower distress. In general, a score of 7 or above suggested distress.

Table 2

The Children's Hospital of Eastern Ontario Pain Scale: (CHEOPS) Distress Behaviors

Behaviors	Score
Cry	
No Cry	1
Moaning	2
Crying	2
Screaming	3
Facial	
Smiling	0
Composed	1
Grimace	2
Verbal	
Positive	0
No talking	1
Other complaint	1
Pain complaint	2
Both complaints	2
Torso	
Neutral	1
Shifting	2
Tense	2
Shivering	2
Upright	2
Restrained	2
Touch	
No touching	1
Reaching	2
Touching	2
Grabbing	2
Restrained	2
Legs	
Neutral	1
Squirm/Kick	2
Drawn up/Tense	2
Standing	2
Restrained	2

RESULTS

Descriptive and background characteristics for children and parents, including means, standard deviations, and group distributions, are presented in Table 3 and Table 4. There was missing data for some demographic and background characteristics because some parents did not provide answers for the following, information on whether the child has been hospitalized before (n = 5), number of previous hospitalizations (n = 4), child's special needs diagnosis (n =1), parent's report of child's level of worry (n = 2), social economic status (n = 5), information on whether the parent talks to the child about the doctor (n = 1), mother's age (n = 3), mother's ethnicity (n = 1), mother's living arrangement (n = 7), mother's education (n = 1), father's age (n = 23), father's ethnicity (n = 19), and father's education level (n = 22). One-way ANOVAs, Chi-Square, and Kruskal-Wallis tests were completed to determine if there were any significant differences between groups on the descriptive and background characteristics (see Table 3). No significant differences were found between groups on background and demographic information of the children and parents, indicating that the descriptives were closely distributed throughout the four activity groups (i.e., the medical play, medical information video, typical play, and non-medical video control groups). Because the variables of chronological age and cognitive age approached significance, analysis with both ages as the covariates was performed as an exploratory measure, and no additional significant findings were revealed.

Children's Anxiety Level

A repeated measures ANOVA, with time as the repeated measure (i.e., before the activity, after the activity, and after the doctor's visit) was conducted to examine the effects of

Table 3. *Background and Demographic Information of Children*

Variable	Groups				F	X^2	p
	Medical Play Video	Medical Play	Typical Play	Control			
Child							
Chronological Age	7.55 (1.71)	8.33 (1.98)	9.13 (1.73)	8.64 (2.01)	2.27		.08
Cognitive Age (DP3)	7.78 (2.34)	8.40 (2.34)	9.53 (2.18)	9.31 (2.29)	2.26		.09
Gender						.62	.89
Male	9	8	7	9			
Female	9	10	11	9			
Ethnicity						.63	.39
White	10	9	5	9			
Black	7	9	11	9			
Biracial	1	0	2	0			
Hospitalized Before						1.48	.69
Yes	9	7	8	6			
No	7	9	10	11			

Variable	Groups				F	X^2	p
	Medical Play Video	Medical Play	Typical Play	Control			
Child							
Number of Hospitalizations	1.43 (0.79)	1.29 (0.49)	2.83 (2.79)	1(0)	2.03		.14
Special Needs Diagnosis						8.94	.44
Yes	3	3	4	2			
No	14	15	14	16			
Received a Shot						3.64	.30
Yes	0	1	3	2			
No	18	17	15	16			
Level of Worry about Visit							.13
None	10	6	6	12			
A Little	5	10	10	6			
A Lot	2	1	2	0			

Table 4. *Background and Demographic Information of Parents*

Variable	Groups				*F*	X^2	*p*
	Medical Play Video	Medical Play	Typical Play	Control			
Parent							
SES						16.16	.18
Upper	0	2	3	0			
Upper Middle	2	1	1	3			
Middle	8	2	2	3			
Lower Middle	3	5	5	7			
Lower	4	7	4	5			
Level of Worry about This Doctor's Visit							.76
None	14	15	14	16			
A Little	4	3	2	2			
A Lot	0	0	2	0			

Variable	Groups				F	X^2	p
	Medical Play Video	Medical Play	Typical Play	Control			
Parent							
Do You Talk to Your Child about going to the Doctor?						.67	.88
Yes	16	17	16	16			
No	1	1	2	2			
Mother							
Age	36.18 (9.73)	39.17 (10.8)	37.65 (7.82)	33.0 (6.6)	1.51		.22
Ethnicity						5.58	.47
White	11	10	6	8			
Black	7	8	11	9			
Native American	0	0	1	0			
Education Level							.99
Less than 7 years	0	0	0	0			
7-9 years	0	2	0	1			
10-11 Years	3	2	1	2			

Variable	Groups				F	X^2	p
	Medical Play Video	Medical Play	Typical Play	Control			
Mother							
Education Level							
High School Graduate	3	3	7	4			
1-3 Years of College	9	6	5	6			
College Graduate	1	3	2	2			
Professional School	2	2	3	2			
Living Arrangement						5.84	.92
Husband	8	8	7	4			
Significant Other	1	2	3	3			
Parents	1	2	1	2			
Friends	5	4	4	6			
Alone	0	2	1	1			
Father							
Age	39.92 (9.45)	40.38 (10.05)	39.46 (7.18)	35.40 (7.4)	.74		.53

Variable	Groups				F	X^2	p
	Medical Play	Medical Play Video	Typical Play	Control			
Father							
Ethnicity						8.66	.47
White	10	7	5	6			
Black	3	7	6	6			
Hispanic	0	0	1	1			
Native American	0	0	1	0			
Education Level							.95
Less than 7 years	0	0	1	0			
7-9 years	0	0	1	1			
10-11 Years	3	4	1	2			
High School Graduate	3	4	5	4			
1-3 Years of College	4	3	2	5			
College Graduate	1	0	1	0			
Professional School	1	2	2	0			

type of activity (i.e., medical play, medical information video, typical play, non-medical video control) on children's pulse, as a physiological indicator of anxiety. No significant effects were found, F (6, 104) = .49, p = .84.

It was observed that the reason for the child's visit could be related to the level of distress behaviors. Therefore, a secondary data analysis was done to further examine the hypothesized relationships taking into account why the child was visiting the doctor. A 3 X 4 X 2 repeated measures ANOVA with time as the repeated measure (i.e., before the activity, after the activity, and after the doctor's visit) and type of activity (i.e., medical play, medical information video, typical play, non-medical information video control) and reason for doctor's visit (i.e., general checkup or ill checkup) as the between subjects variables was conducted on children's pulse. A significant interaction was found between time, reason for visit, and type of activity on children's pulse, $F(6, 94) = 2.44$, $p < .05$. Paired samples t-tests were conducted for post hoc comparisons and revealed a decrease in pulse from after the assigned activity to after the doctor's visit for those children in the typical play group at the doctor for a general checkup, t (3) = 5.58, p = .01.

A one-way ANOVA was performed to examine the effects of type of activity on the children's anxiety level after the doctor's visit. Children's post doctor's visit anxiety level was determined using the child drawing as a projective measure. There was not a significant effect of type of activity on the children's level of anxiety, as depicted in their drawings, $F(3,36) = .40$, p = .76.

Children's Level of Fear

Analysis was performed to determine the validity of the faces of the fear scale. In the fear scale, children were asked to point to a face that looked like how they were feeling before the assigned activity, after the assigned activity, and after the doctor's office. Children were then

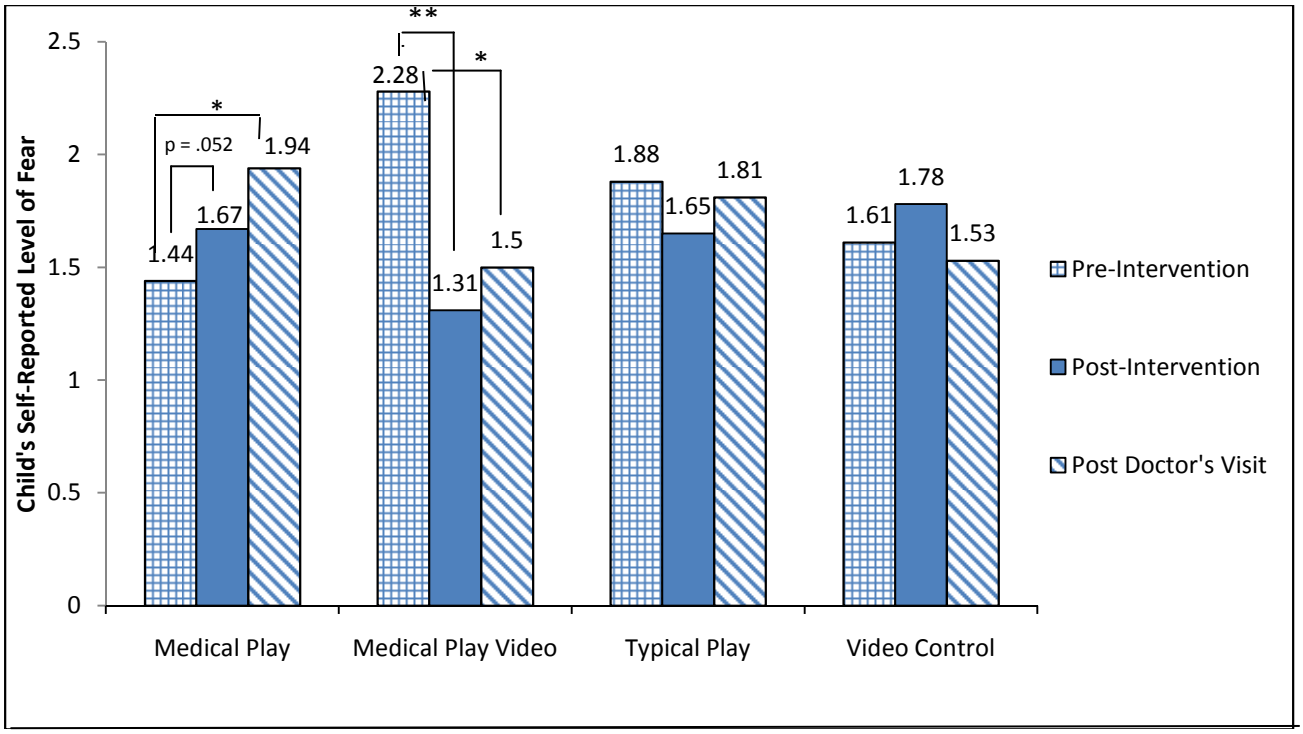
asked to describe what that chosen face looked like. For example, if they pointed to the fifth face (i.e., the face depicting fear), it was expected for the children to describe the face with words such as scared or afraid. Children's verbal descriptions were coded as follows: 1) very happy and or excited, 2) happy and or smiley face, 3) straight face, neutral, or a little happy and a little sad, 4) a little worried or sad, and 5) very worried or very scared. Correlations were used to compare the children's fear score to their verbal description before the assigned activity, after the assigned activity, and after the doctor's visit. Significant relationships were found between the children's fear scores and their verbal description of the face before the assigned activity (r = 0.81, $p < .001$), after the assigned activity ($r = .46$, $p < .001$), and after the doctor's visit ($r = .83$, $p < .001$). Therefore, the fear scale was found to be an accurate illustration of emotions ranging from very happy to very fearful.

A repeated measures ANOVA with time as the repeated measure (i.e., before the activity, after the activity, and after the doctor's visit) and type of activity as the between groups variable (i.e., medical play, medical information video, typical play, non-medical information video control) was conducted on children's self-reported level of fear. Mauchly's test indicated the assumption of sphericity for self- reported fear had been violated, $X^2(2) = 5.99$, $p = .05$; therefore, the degrees of freedom were corrected using the Huynh-Feldt estimates of sphericity ($\hat{\varepsilon} = .99$) for that variable. A significant interaction was found between time and type of activity on children's self-reported fear level, $F(5.92,122.31) = 3.43$, $p < .01$. Paired samples t-tests were conducted for post hoc comparisons within groups (see Figure 1) and revealed 1) an increase in fear for children in the medical play group, from baseline to post-activity, suggesting that children in the medical play activity became more fearful after medical play; 2) an increase in fear for children in the medical play activity from baseline to after the doctor's visit, suggesting

that children in the medical play activity were more fearful after the doctor's visit compared to the baseline; 3) a decrease in fear for children who watched the medical information video from baseline to post activity and from baseline to after the doctor's visit, suggesting that the medial information video was effective in reducing children's fear after the activity and after the doctor's visit.

As state previously, there was a relationship between the reason for the child's visit and the level of distress behaviors observed. Therefore, a secondary data analysis was done to further examine the hypothesized relationships taking into account why the child was visiting the doctor. A 3 X 4 X 2 repeated measures ANOVA with time as the repeated measure (i.e., before the activity, after the activity, and after the doctor's visit) and type of activity (i.e., medical play, medical information video, typical play, non-medical information video control) and reason for doctor's visit (i.e., general checkup or ill checkup) as the between subjects variables was conducted on children's self-reported fear level. A significant three-way interaction was found between time, reason for visit, and type of activity on children's pulse, $F(3, 57) = 2.83$, $p < .05$. Paired samples t-tests were conducted for post hoc comparisons and revealed an increase in self-reported fear levels from before the assigned activity to after the assigned activity for those children in the non-medical information video group at the doctor for a general checkup, $t\ (10) = 2.65$, $p < .05$. In addition, it was revealed that for children in the medical information video group who were visiting the doctor for an ill checkup fear decreased from before the assigned activity to after the assigned activity, $t\ (10) = 4.25$, $p < .05$, and from before the assigned activity to after the doctor's visit, $t\ (10) = 2.40$, $p < .05$.

Figure 1. Within Group Changes in the Fear Scale from Pre-Activity to Post-Activity to Post Doctor's Visit



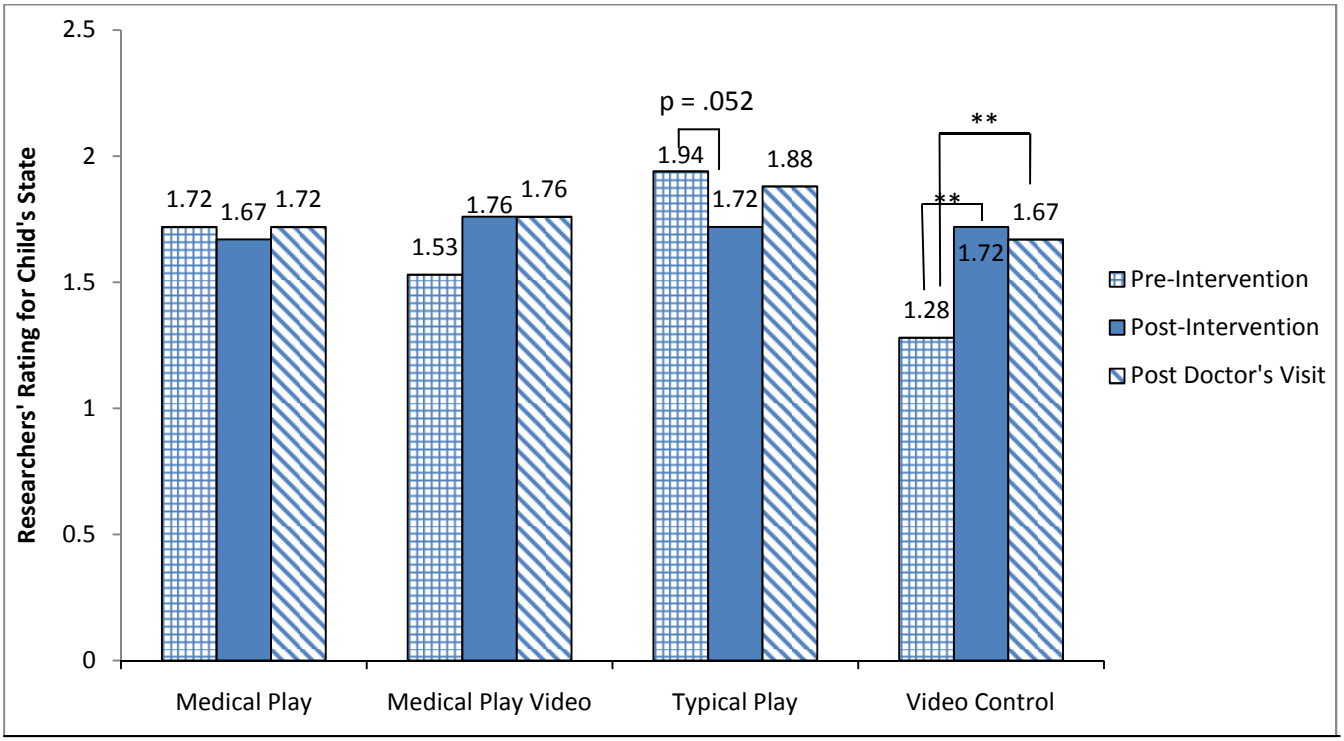
Note. * indicates a significant level of .05. ** indicates a significant level of .01. Lower scores are more optimal.

Children's' Distress Behaviors

Children's distress behaviors were assessed in two manners. For one, a researcher, blind to the children's assigned group, rated children's distress behaviors using the Behavioral Observation Scale (BOS: state, affect, activity, vocalization, and fidgeting/squirming) at baseline, after the activity, and after the doctor's visit. The second method for assessing children's distress behaviors was by nurses who also were kept blind to the children's group assignment and who rated the behaviors of the children (using the CHEOPS) while they were being triaged (i.e., having their blood pressure, temperature, weight, and height measured). For

the BOS, a repeated measures ANOVA with time as the repeated measure (i.e., before the activity, after the activity, and after the doctor's visit) and type of activity as the between groups variable (i.e., medical play, medical information video, typical play, non-medical information video control) revealed a significant time by group interaction effect, $F(128) = 3.02$, $p < .01$, using Roy's Largest Root. Roy's Largest Root generally is viewed as a statistic that is upper bound on the F, therefore yielding a lower bound on the significance. This less conservative statistic was used in this exploratory study to further examine the differences within groups on observed behaviors to further examine how different play or video activities impact children's behaviors while in the doctor's office. Mauchly's test indicated the assumption of sphericity for state observed in the BOS had been violated, $X^2(2) = 9.62$, $p < .01$; therefore, the degrees of freedom were corrected using the Huynh-Feldt estimates of sphericity ($\hat{\varepsilon} = .94$) for that variable. Further analysis revealed a significant interaction between time and type of activity on the behavior of state, $F(5.65,120.43) = 2.23$, $p < .05$. Paired samples t-tests revealed that children in the typical play group improved in their state, or alertness, from baseline to post-activity (see Figure 2). The video control group (i.e., the group who watched the video on safari life) shifted from an active alert state at baseline to a more inactive alert state after watching the safari video. The decrease in alertness also occurred from baseline to after the doctor's visit, suggesting that they were most alert before the activity (see Figure 2).

Figure 2. Within Group Changes in State from the Behavioral Observation Scale from Pre-Activity to Post-Activity to Post Doctor's Visit

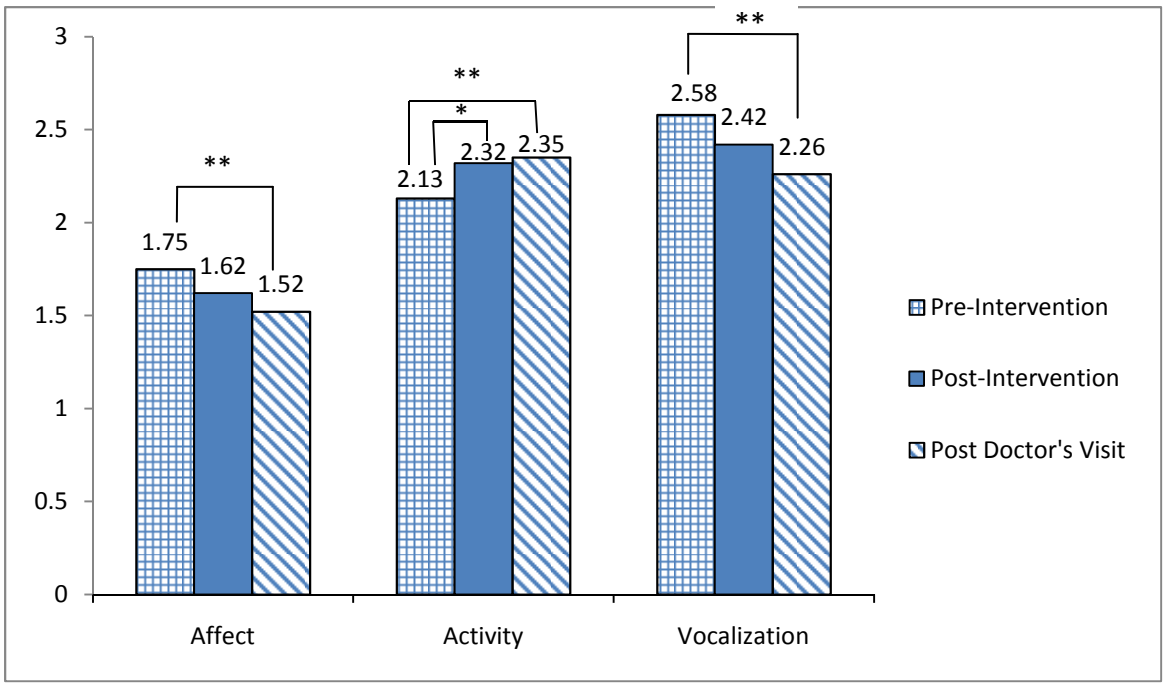


Note. * indicates a significant level of .05. ** indicates a significant level of .01. Lower scores are more optimal.

A main effect of time was found for affect, $F(2,128) = 5.89$, $p < .01$, and post hoc t-tests revealed that, overall, children's affect scores were lower (i.e., more optimal) after the doctor's visit than at baseline (see Figure 3). In addition, a significant time effect was found for activity, $F(2,128) = 4.85$, $p = .01$. Paired t-tests showed that overall, the mean for activity increased from baseline to after group assignment, as well as from baseline to after the doctors' visit. As a group, children were less active after the doctor's visit compared to baseline. Finally, a significant time effect was found for vocalization, $F(2,128) = 6.22$, $p < .01$. Paired samples t-tests for vocalization revealed that children's mean scores decreased from the period of time

before the assigned activity to after the doctor's visit, suggesting they become more vocal because lower scores are more optimal (see Figure 3).

Figure 3. Participants' Changes in Affect, Activity, and Vocalizations from the Behavioral Observation Scale from Pre-Activity to Post-Activity to Post Doctor's Visit



Note. * indicates a significant level of .05. ** indicates a significant level of .01. Lower scores are more optimal.

A one-way ANOVA examining the effects of type of activity on the distress behaviors reported by the nurses (see Table 5) revealed a significant effect for children's leg distress behaviors (i.e., kicking, restrained, etc.,), $F(3) = 2.85$, $p < .05$, and the nurses report of the children's overall difficulty during the triage procedures (i.e., on a scale from very easy to very difficult), $F(3) = 5.63$, $p < .01$. Post hoc results for leg behaviors revealed a significant difference between the medical play group and the non-medical information video control, with the medical play group having a higher mean, suggesting that they were more likely to

squirm/kick or display distress with their legs than the non-medical information video control group during triage. The medical play group was also significantly different than the medical information video, typical play, and non-medical information video control groups on the nurses' overall rating of how difficult the children were during the triage procedures, with the medical play group having a higher mean than the rest of the activity groups. This would suggest that children in the medical play group were more difficult than any other group while the nurse was performing triage procedures, such as checking temperature, measuring blood pressure, etc.

Relationships Between Variables

Correlation analysis was performed to determine the relationships between variables of interests. For example, pulse is a physiological measure of anxiety. In the study, anxiety was also assessed through the projective measure of the children's drawings. Correlation analysis provided information on the relationships between such variables and others to further clarify relationships within the study. Results of the correlation analysis are found in Table 6.

Several significant correlations were revealed. For one, children's anxiety (as reflected in their drawings) was positively correlated with their self reported fear scores after the doctor examined them. In addition, parents' self-reported level of worry about the doctor's visit positively correlated with their reports of the children's level of worry about the doctor's visit and the children's baseline pulse.

The children's pulse before the assigned activity, after the assigned activity, and after the doctor's visit were all strongly and positively related, suggesting children's level of anxiety, as indicated by their pulse, remained consistent throughout the doctor's visit (i.e., if their anxiety was high at the beginning of the doctor's visit, it was also high after the assigned activity and

after the doctor's visit). The children's baseline pulse was also positively correlated with 1) the nurses' rating of the children's anxiety during triage, 2) the children's overall stress as reported by the nurses, 3) the children's overall pain as reported by the nurses, and 4) the children's overall difficulty as reported by the nurses. These relationships indicate for children with higher starting anxiety, as indicated by their pulse, nurses reported more anxiety, stress, pain, and difficulty during triage procedures. In addition, a positive relationship between the children's pulse after the assigned activity and total anxiety (based on distress behaviors reported by the nurses) was revealed, suggesting children with higher anxiety after the assigned activity displayed more distress behaviors during triage.

The children's baseline fear, fear after the assigned activity, and fear after the doctor's visit were all significantly and positively related. This suggests children who had higher fear level at the beginning of the doctor's visit also had higher fear level after the assigned activity and after the doctor's visit. In other words, the children's level of fear was consistent throughout the doctor's visit. In addition, the children's baseline fear was moderately and positively related to the nurses' reports of overall pain of the children during triage, suggesting children who started the doctor's visit with more fear displayed more pain during the triage procedures. Finally, significant relationships were also found between subscales of the Nurse Rating of Child Distress Scale (NRCDS). The anxiety scores of the children (based on distress behaviors reported by the nurses) were positively related to the nurses' reports of 1) overall stress, 2) overall pain, and 3) overall difficulty during triage. In addition, the nurses' reports of the children's overall stress during triage was strongly and positively related to the nurses' reports of the children's overall difficulty during triage. These findings, regarding the NRCDS, suggest the subscales are related, as expected.

Table 5

Mean Scores (sd) and Between Group Differences for Nurse Rating of Child Distress Scale

Variable	Groups				*F*	*p*
	Medical Play	Medical Play Video	Typical Play	Video Control		
Facial	0.56 (.71)$_a$	0.39 (.61)$_a$	0.39 (.50)$_a$	0.33 (.59)$_a$	0.45	.72
Verbal	0.61 (.61)$_a$	0.56 (.62)$_a$	0.44 (.51)$_a$	0.33 (.49)$_a$	0.88	.46
Torso	1.28 (.46)$_a$	1.11 (.32)$_a$	1.17 (.38)$_a$	1.06 (.24)$_a$	1.25	.30
Touch	1.28 (.46)$_a$	1.17 (.38)$_a$	1.17 (.38)$_a$	1.00 (0)$_a$	1.87	.14
Legs	1.33 (.49)$_a$	1.11 (.32)$_{ab}$	1.17 (.38)$_{ab}$	1.00 (0)$_b$	2.85	.04*
Total	6.06 (1.8)$_a$	5.39 (1.88)$_a$	5.33 (1.33)$_a$	4.72 (1.18)$_a$	2.15	.10
Overall Stress	1.00 (1.14)$_a$	0.56 (1.25)$_a$	0.56 (.78)$_a$	0.28 (.46)$_a$	1.75	.17
Overall Pain	0.33 (1.19)$_a$	0.39 (.61)$_a$	0.50(.86)$_a$	0.39 (1.24)$_a$	0.09	.97
Overall Difficulty	0.56 (.78)$_a$	0.17 (.51)$_b$	0.00 (0)$_b$	0.00 (0)$_b$	5.63	.002**

Note. Mean scores that do not have the same subscript are significantly different at the .05 level. Lower scores are more optimal.
* p < .05, ** p < .0

Table 6
Correlations between Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Child's Anxiety (Drawing)		.03	.16	.03	.09	.09	-.16	.01	.33*	.22	.17	-.10	.23
2. Parents' Level of Worry			.29*	.30*	.21	.18	.18	.10	-.05	.08	-.03	-.03	-.04
3. Parents' Report of Child's Level of Worry				.20	.17	.19	.13	.08	.17	.17	.19	.05	-.001
4. Child's Pulse before Activity					.81**	.68**	.14	.16	.19	.40**	.27*	.37**	.30*
5. Child's Pulse after Activity						.67**	.12	.14	.21	.31*	.19	.19	.22
6. Child's Pulse after Doctor's Visit							.16	-.14	.13	.22	.07	.14	.14
7. Child's Fear before Activity								.32**	.26*	.11	.07	.39**	-.008
8. Child's Fear after Activity									.34**	.08	-.01	.13	.08
9. Child's Fear after Doctor's Visit										.04	.11	.16	-.01
10. Total Anxiety from NRCDS											.73**	.29*	.63**
11. Overall Stress from NRCDS												.17	.69**
12. Overall Pain from NRCDS													.16
13. Overall Difficulty from NRCDS													

Note. * indicates a significant level of .05. ** indicates a significant level of .01.

Discussion

The purpose of this study was to examine how different activities can benefit children going to visit a doctor, with the thesis that play, particularly medical play, would be most beneficial. In addition, the effects of the different components of medical play (i.e., receiving information about medical equipment versus manipulating or touching medical equipment) were explored to better understand medical play. Since play and non-play activities in the doctor's office have not been explored previously, the findings from this study may contribute to the literature.

Overall, most of the findings revealed results that were not expected as outlined by the study's hypotheses. For example, medical play was found to be less effective in reducing anxiety, fear, and procedure distress compared to the other activities. However, the purpose of the study was to examine the effectiveness of activities for children in the pediatrician's setting, and the results provides some answers to this question, including that children who participated in typical play, compared to those who participated in medical play, revealed less distress during triage. The results also revealed what is beneficial about medical play. These results suggest it is the obtainment of medical information during play, rather than the hands on manipulation, that benefits children visiting the doctor's office.

The first hypothesis was that children who participate in medical play would display less anxiety, fear, and procedure distress than children who view a medical play video, engage in typical play, or watch a video on African safari life. The results did not support this

hypothesis. In fact, medical play was the activity in which children had the most fear and procedure distress. Although there were no differences in anxiety, either by pulse or the drawings, the children's self-reported fear increased after the medical play activity and after the doctor's visit. In contrast, immediately after watching the medical information video, children reported less fear and this reduction in fear persisted after the doctor's examination. Compared to all other activities, children in the medical play group displayed more difficulty during triage, suggesting that they were more distressed after the medical play activity. In addition, children who participated in medical play had higher reports of kicking and squirming when the nurses examined them than the children who watched a video on African safari life, again suggesting more distress. For children at the doctor's office, playing with medical items appears to increase fear and procedure distress, more so than viewing a video of another child participating in medical play, playing a developmentally appropriate board game, or watching a video on African safari life.

Surprisingly, these findings about medical play contradict previous research. Studies have reported that medical play allows children to express themselves through exploration of medical items (Ellerton, et al., 1985; McGrath & Huff, 2001) and reduces anxiety (Bloch & Toker, 2008) and distress (Burstein & Meichenbaum, 1979). For example, the effectiveness of familiarizing children to the medical environment through role-rehearsal (i.e., children providing health care to their teddy bears) has been examined. Compared to a control group who did not receive the role-rehearsal activity, the children in the experimental group reported significantly lower anxiety (Bloch & Toker, 2008). Another study found children who played with medical-themed items before surgery displayed less distress after the procedure than those children who did not play with medical-themed items (Burstein & Meichenbaum, 1979).

Expressing fear is one benefit children are thought to experience through medical play (Webb, 1995). Although this is frequently stated in explanations of medical play and suggested through anecdotal notes, no studies have examined it. This is the first study known of in the literature that has actually examined fear in the context of medical play and has found that children report more fear after participating in medical play. The short time span of a doctor's visit may be inhibiting children in the medical play group's ability to internalize control over emotions and decrease fear levels. Hands on manipulation of medical items through play may allow children to express fears during the play. This could possibly bring such fears to the forefront of children's thought processes, increasing their self-reported fear levels. It could be that fears are brought to children's attention during medical play, but children cannot internalize control over the emotions in the time frame, which would, in turn, increase their fear levels.

That medical play increased children's fear at the doctor's office was an unexpected finding. Future studies are needed to further explore why children become fearful after medical play. For example, the frequency of fear expression and children's self-reported fear level could be examined to determine if there is a relationship between these two variables. In addition, studies should examine how length of medical play may affect children's fear level, such as determining if a shorter medical play session would inhibit children's abilities to internalize control over fears or whether a longer medical play session would reduce their overall fear levels.

Another reported benefit of medical play in the literature is that it is thought to promote control over emotions in distressed children undergoing a medical experience (McCue, 1980). However, in the current study, children in the medical play group squirmed and kicked their legs more than children in the non-medical information video control group and were rated as more

difficult by the nurses than children in the medical information video group, typical play group, and non-medical information control video group. Kicking and displaying difficulty during procedures are signs of distress (Hart & Bossert, 1994; Katz, Kellerman, & Siegel, 1980). Since there are no other studies which assess medical play and distress, it is hard to say why medical play increased distress in children. In the current study, it could be that manipulating the medical equipment increased children's focus on the equipment causing them to have more distress. Typically, child life specialists center children's attention on something other than the stressor; however, playing with the medical items during the short time waiting for a doctor's visit may increase children's focused attention on the medical items, increasing distress if they are fearful of these items. Our study found children in the medical play group to report more fear, further suggesting this idea. Replication studies are needed to determine if, indeed, medical play increases distress in the doctor's office.

While previous studies have not examined medical play in the doctor's office, there are studies that have examined medical play for children receiving surgery, those being admitted to the hospital and those outside the hospital setting. Medical play could affect children differently in different settings. Components, such as time, may make medical play not effective in the doctor's office but effective in the hospital setting. In addition, previous studies have been methodologically flawed. For example, the study that compared children who played with medical items before surgery to those who did not play with medical items before surgery was not a controlled study and post-procedure anxiety was not directly assessed. Frequency of play with medical items versus non-medical items was assessed in this study rather than placing the children in control and experimental groups (Burstein & Meichenbaum, 1979). Another study only used a one-item scale to measure anxiety after medical play, and it was designed for use in

the dentist office (Block & Toker, 2008). Although these studies reported positive findings, they were not scientifically sound. Therefore, more rigorous experimental studies should be conducted to determine if previous findings of the benefits of medical play in the hospital are valid.

Although there were no significant differences in age between groups, there was a trend for the medical play group to have younger children when compared to the other groups. Younger children are more vulnerable to the stressors of the healthcare setting because of their developmental stage, including the inability to distinguish between fantasy and reality, the need to display autonomy, and the fear of bodily harm (Rollins, Bolig & Mahan, 2005). The younger age of the participants in the medical play activity group could be explaining the lack of benefits seen by medical play in our study. The ability of the children to work through their fears and emotions in medical play may be inhibited due to the higher number of children in the ages of heightened vulnerability. A future study might include a more even distribution of ages to determine if medical play affects children differently at different ages.

Although previous studies have supported the use of medical play, our study did not find any benefits to medical play at the doctor's office. Other activities, including viewing a medical play session, participating in typical play, or watching a developmentally appropriate video had more positive effects on children visiting a doctor's office. If replicated and supported, this would suggest simply watching a video of a child participating in medical play and/or one with a developmentally appropriate theme or playing developmentally appropriate board games may help reduce children's distress when visiting the pediatrician.

Medical play is hands on exploration of medical items with the goal of allowing children to express their fears, anxieties, and misconceptions, to familiarize themselves with medical

items, and to gain information about medical themes through discussions with the child life specialists. The question arises is the goal of medical play reached by the hands on exploration of the materials or children's cognitive assessment of the play? The medical play activity consisted hands on manipulation and obtainment of medical information, while the medical information video allowed children to simply view another child participating in medical play and this provided only the component of obtainment of information.

Hypothesis two states that children in the medical play activity would display less anxiety, fear, and procedure distress than children in the medical information video, suggesting it is the hands on manipulation in medical play that benefits children. The results did not support this hypothesis and actually revealed that the cognitive component was more effective at reducing fear and distress than the hands on manipulation. As stated earlier, anxiety did not change within the groups. Fear increased for children participating in the medical play activity and decreased for those children in the medical information video activity, indicating children in the medical play activity were more fearful than children viewing the medical information video. As for distress, children in the medical play activity had higher rates of difficulty during triage compared to those who viewed a medical play session. In summary, viewing a taped medical play session appears to be more beneficial to children visiting the doctor than actual manipulation of the medical equipment.

In reviewing the purpose of this hypothesis, these findings help inform what component of medical play is beneficial (i.e., hands on manipulation or obtainment of medical information). Our findings indicate that the most effective component of medical play is the cognitive component, that is the obtainment of medical information. At the doctor's office, children's fear and distress were reduced by gathering information through viewing a video tape of medical

items and seeing another child ask questions, voice concerns, or express fears when manipulating the medical items. The opposite effect was seen for children participating in hands on exploration of medical items through medical play.

This finding is somewhat contradictory to others. The few studies that exist on medical play have found it to be a beneficial tool in expressing fears (Ellerton, et al., 1985) and reducing anxiety (Burstein & Meichenbaum, 1979; Bloch & Toker, 2008). In addition, the literature frequently documents how play is beneficial because it allows children to work through stressful or emotional experiences in manageable pieces (Barnett & Storm, 1981; Frost, 2005; Gariepy & Howe, 2003). Based on those ideas, it was surprising to learn that for children at the doctor's office that the ability to play with medical items did not allow them to work through emotional fears and distress, but actually heightened their fears and distress.

Through viewing a taped session of another child participating in medical play, the children were able to gain information by hearing the labels of the medical items, hearing clarifications from the child life specialist, and viewing demonstrations of the use of the medical items by the child in the video. Previous studies have supported the benefits of children receiving information before medical experiences (Felder-Puig, et al., 2003; Hatava, et al.,2000; Nelson & Allen, 1999). For example, recently, a study of 91 children, ages 4 to 10 years, examined the effectiveness of providing information through puppet play to children who would be undergoing a minor surgery. The puppet play consisted of an adult providing information to the children about the medical procedures and hospital stay through the use of doctor and patient puppets. Children in the experimental group showed fewer behavioral problems after the procedure than the control group (Athanaissiadou, Tsiantis, Christogiorgos, & Kolaitis, 2009).

For children at a doctor's visit, developmentally appropriate information could be all that is needed to help reduce distress.

The medical information video may allow the children to cognitively process the information in a positive way and display more optimal behaviors and reduce fear as a result of cognitive internalization. Cognitive behavioral approaches focus on providing children with the resources to identify their emotions and adjust such emotions in order to have competence during the tasks (Moore & Russ, 2006). For example, modeling allows children to view appropriate responses to stressful experiences, internalize such responses, and change their own response (Knell, 1998). The behaviors of the children in the medical information video group, including the self-reported reduction of fear, and the nurses' rating of less difficulty during the triage procedures, may be the result of cognitive internalization. The child filmed in the medical play session played out his/her stressors by exploring the medical items, manipulating them in any manner, and vocalizing emotions. In the video, the child gained control over the emotions and associated the stressors (i.e., medical equipment) with positive feelings of mastery and control. Likely, children in the medical information video group saw this and associated their experience visiting the doctor with positive emotions, thus leading to more adaptive behaviors.

One study examined the effectiveness of educating young children with asthma about their condition using an educational video. In the video, children similar in age to the target population provided information about asthma and demonstrated skills related to asthma management. Adults praised the children in the video for managing their asthma related issues and important themes were repeated. Children in the video group displayed significantly greater gains in knowledge of asthma and experienced fewer non-compliant behaviors and asthma related symptoms than children in the control group (Holzheimer, Mohay, & Masters, 1998).

Others have suggested that providing children with information in the medical setting is viewed as a more efficient intervention than medical play, especially in fast changing medical environments. In such environments, time is scarce and it is difficult to develop the trusting relationships with adults necessary for medical play. A directed activity is easier to guide the children's acquisition of information about a specific topic and ensure their understanding (Bolig, et al., 1991).

During a doctor's visit, time may factor into how effective hands-on exploration is on reducing anxiety, fear, and distress. Doctor's visits usually entail a short time frame for the use of medical play. In the current study, when time to set up and initiate the play was factored in, children typically had ten or so minutes left to participate in medical play. It takes time for children to build their ideas through play. Children need time to get comfortable with the materials, explore different pathways, and draw conclusions about their play. If children do not have time, their play can be inhibited (Hendrick & Weissman, 2011). In addition, medical play is adult initiated and requires the children to develop rapport and trust quickly with an adult stranger in order to feel comfortable expressing their emotions. At the doctor's visit, ample time may not be available to gain trust with the adult and fully explore the medical items in order to allow children to master their emotions of the upcoming medical experience.

The medical information video was most effective for those children who were sick at the doctor's visit. These children reported a decrease in self-reported fear throughout the doctor's visit. This would suggest viewing a medical information video is particularly beneficial for ill children at the doctor's office.

Our findings suggest that seeing may be enough, particularly for children who are ill. Viewing another child manipulate medical equipment is effective at reducing fear and procedure distress for children visiting a doctor. If replicated, pediatric offices may reduce fears in young patients by showing a video of a child participating in medical play. This could be especially beneficial to offices and clinics that may not be able to staff a child life specialist due to lack of funding. Through a medical information video, children may gain the necessary amount of information to cognitively regulate their emotions and display more optimal behaviors during procedures. This in turn would allow the medical team to better accommodate for patients' psychosocial needs even in the absence of staff, like child life specialist trained to do so.

The third hypothesis states children who participate in a typical play activity would display less anxiety, fear, and procedure distress than children who watch a video on safari life. This was partially supported by the observed differences in state between the typical play group and the non-medical information video control group. For the typical play group, the children became more alert immediately after playing a board game. The opposite effect was seen in the video control group. These children became less alert immediately after the video and after the doctor's visit. In addition, for the typical play group, the children who were there for a general checkup decreased in anxiety, as indicated by pulse, from after the activity to after the doctor's visit. The findings do suggest typical play can increase alertness, more so than watching a developmentally appropriate video and typical play can decrease anxiety for well children at the doctor's office.

Play is how children work through difficult events. Play helps children cope by allowing them to express the emotions in manageable pieces and become habituated to these emotions overtime, allowing children to then associate the difficult experience with feelings of

competency in overcoming the emotions (Moore & Russ, 2006). Previous studies have examined the benefits of play through self-report measures by the child (Kenealy, 1989; Salmela, et al., 2010) and through experimental observations (Barnett & Storm, 1981). For example, the effectiveness of play in reducing anxiety in a group of anxious preschoolers was examined. The children were randomly assigned to either an experimental group that participated in free play or a control group that was read a story. Children that participated in play decreased in anxiety (Barnett, 1984). Our findings further suggest playing a developmentally appropriate game is effective in allowing children to display more optimal behaviors, such as alertness, during a doctor's visit.

A board game is a form of structured play. This means that it is a form of play that contains more rules and directions for children to follow and less self-expression and choices for children to explore (Hendrick & Weissman, 2011). In the past, the ability for children to express themselves and use board games as a therapeutic tool has been questioned. For example, some felt board games prevent the expression of fantasies, inhibit imaginary play, and do not allow children to confront conflicts (Oren, 2008). However, recent literature recognizes board games can certainly be used as a psychosocial tool (Matorin & McNamara, 1996; Oren, 2008; Wilde, 1994). Board games can enhance pyschosocial development by providing children the opportunity to control impulses (i.e., turn taking and following rules), cope with anxieties and frustrations of life (i.e., losing or not always getting what one wants), and understand the relationship between actions and outcomes (i.e., if I do this, this will happen) (Oren, 2008).

Based on their observations of play, Schaefer and Reid (1986) suggest attention is one of the cognitive skills that develop from participating in board games. Games could distract children from the stressors of the medical experience by focusing their attention on the action of

the game, which in turn, may enhance the children's abilities to control impulses and display more optimal behaviors during the doctor's visit. Previous studies have explored this concept. For example, a recent study examined the ability of a game to decrease pain and anxiety for children undergoing a painful procedure. Children in the experimental group were distracted during the procedure with a visual and auditory game while the control group underwent the procedure without the game. The experimental group reported significantly less pain and anxiety than the control group (Das, Grimmer, Sparnon, McRae, & Thomas, 2005).

Another study found similar results by examining the benefits of using games (i.e., I spy, hand-held video games, virtual reality goggles, and music tables) as a distractor for children undergoing a venipuncture procedure. Compared to a control group, children who had access to a game as a distractor displayed significantly less fear and distress during the procedure, as reported by a nurse blind to the group assignment (Windich-Biermeier, Sjoberg, Conkin Dale, Eshelman, & Guzzetta, 2007). Although these studies examined the use of games during a procedure, they do have implications for the current study by suggesting games are an effective tool for focusing children's attention and emotions in the medical environment on something other than medical events.

Based on our findings, playing a developmentally appropriate board game is an effective activity to provide for school-age children visiting the doctor, particularly well children attending the doctor's visit for a general checkup. This structured play activity may act as a distractor allowing the children to focus their attention on something other than the medical visit. Through this focused attention, the children are more alert. Pediatrician offices and clinics can apply this information by providing a structured developmentally appropriate activity, such as a game, for school aged children in the waiting area in hopes of more optimal psychosocial experiences by

child patients. It is not uncommon to find some structured play items provided at pediatrician's offices, including simple puzzles or play centers (i.e. a square wooden box with mirrors, steering wheels, and bead puzzles for the children to manipulate). However, most of these play items are only appropriate for preschool age children. Our findings suggest that school aged children may also benefit from opportunities to play with age appropriate activities at their doctor's office. Also, supervised play is more effective at reducing anxiety and fostering compliant behaviors than non-supervised play in the doctor's office (Ispa, et al., 1988; William & Powell, 1979); therefore, child life specialists should be provided in doctor's offices and clinics to maximize the benefits of typical play.

Hypothesis four states that children who participate in the medical information video group would display less anxiety, fear, and procedure distress than children in the non-medical information video control group (i.e, video on safari life). The findings support this statement because children's fear decreased after viewing a medical play session while children's distress increased after viewing the video on safari life. In the doctor's office, a medical information video may be more beneficial than a non-medical information video.

For children, receiving information before a medical experience has been found to decrease anxiety (Holzheimer, et al., 1998; Kain, et al., 1998). Previous studies have examined the benefits of providing information in the form of books (Felder-Puig, et al., 2003), computer games (Nelson & Allen, 1999) and puppets (Athanaissiadou, et al., 2009). The commonality in all of these studies is that they compared providing children with information to not providing children with information in the medical setting. For example, one study randomly assigned children admitted to the hospital for a surgery the next day to either an experimental group who received a preparation book with information about what to expect during the upcoming surgery

or a control group who had the routine procedures without the book. Children in the experimental group displayed less distress, as reported by their caregiver, than those in the experimental group (Felder-Puig, et al., 2003). These studies have found providing information about upcoming procedures to be beneficial in promoting coping in children in the medical setting; our current findings further suggest this is true at the doctor's office.

The current study found a medical information video to be effective at reducing fear in children at the doctor's office. Another study found similar findings. In that study, asthmatic children were randomly assigned to an experimental group that watched a medical information video or a control group. The medical information video entailed a child of similar age with asthma talking about asthma (i.e., providing facts about the condition) and modeling appropriate behaviors to manage asthmatic symptoms. Children in the experimental group displayed fewer distress behaviors and asthmatic symptoms than those children who did not receive the information through a video (Holzheimer, et al., 1998). This previous study is very similar to the current study in the sense that both videos provided information through a child of similar age and health status to the viewing participants. The children in both videos modeled behaviors and provided information to viewers through play. Based on the findings from both studies, children benefit from informative videos of other children undergoing similar circumstances. Such videos provide information, which in turn decreases fear, distress behaviors, and illness related symptoms.

The benefit found for the non-medical information video is that it decreased distress whereas the medical play activity increased distress. Less distress was seen in this group by less leg movement and overall pain reported by the nurse. However, the fear level for children receiving a general checkup increased after watching the non-medical information video. This

increase in fear suggests the video on safari life was arousing well children in a negative manner. In addition, the non-medical information video was also found to decrease alertness. Therefore, developmentally appropriate videos may not be effective in the doctor's office. Since inconsistent results were found in the current study, this suggests the need for further study.

It is not uncommon to find a television being played at a doctor's office. Our findings would suggest positive effects could be seen by providing a medical information video. The medical information video was found to consistently decrease distress and fear. Therefore, doctor's offices should consider displaying a video providing medical information about the doctor's visit in the waiting area and/or patients' rooms.

The relationships between variables were explored to further examine and understand the components of this study. For example, in the literature, fear and anxiety are often interchanged and viewed as the same. Fear has been defined as an upsetting emotion caused by feelings of impeding danger, pain, or evil while anxiety is an emotion very similar to fear that arises when there is not an impending threat (Carroll & Ryan-Wenger, 1999). The number of fears children report has been found to be related to anxiety, with more fears related to more anxiety (Hart & Bossert, 1994; Ollendick & King, 1991). Therefore, one would expect children's anxiety after the doctor's visit to be related to their fear after the doctor's visit. In the current study, children's anxiety, as depicted in their drawings was related to the children's level of fear after the doctor's visit. Children who reported more fear, also displayed more anxiety in their drawings. One interpretation may be that some children have residual fear after the doctor's visit and display it as anxiety in their drawing.

A previous study examined the relationship between school-aged children's fear, anxiety, and the presence of emotional representations in their drawings. The children completed a

structured interview to evaluate their fears, a questionnaire to assess their anxiety, and a drawing, using a piece of white paper and a pencil, of a "whole person". It was found that as anxiety increased, fear moderately increased. In addition, the drawings were a strong indicator of the children's level of anxiety and fear (Carroll & Ryan-Wenger, 1999). These findings suggest fear and anxiety are closely related and both are displayed in children's drawings, providing support for the relationship between fear after the doctor's visit and children's anxiety, as depicted in their drawing, found in the current study.

Residual fear was depicted as anxiety in the children's drawings. Some of the children at the doctor's office had fear after the doctor's visit. Because these fears were newly experienced (i.e., coming right after the doctor's visit), it is likely the children included them in their drawings which were then scored as an anxiety measure. Because anxiety and fear have been found to be so closely related to each other, it is not surprising to find the children's fear after the doctor's office and their anxiety in their drawings to be related. This information can help the medical team recognize how children can be fearful of their office even in the absence of threats and have anxiety as a result.

There were some important relationships to parents' level of worry about the doctor's visit. Parents felt their children had the same level of worry about the doctor's visit as they themselves had, and the less parents worried the less anxiety the children had, as indicated by pulse. Another study reported very similar findings. Mothers and child patients were assessed for anxiety after receiving preparation for a surgery. Mothers reported their anxiety level and their children's anxiety level. In addition, a nurse assessed the children's anxiety. Results showed, as the mothers' anxiety decreased, they also reported less anxiety in their children, and nurses reported less anxiety in the children (Felder-Puig, et al., 2003).

For parents, a medical visit can include many stressors, such as feelings of helplessness as children experience procedures, a lack of information, and misconceptions about their child's condition (Shandor, Burchinal, Holditch-Davis, Brunssen, Wilson, 2002). These stressors influence the parents' behaviors. It has been shown when parents are coping well during medical procedures they are likely to model coping-promoting behaviors, such as distraction (i.e., look at a book with the child). However, if they are anxious, parents often utilize distress-promoting behaviors, such as endless reassurances (i.e., "Everything is going to be okay.") (McMurtry, Chambers, McGrath, & Asp, 1995; Salmon & Pereira, 2002). Children sense this anxiety, and respond similarly. For example, parental use of reassurances has been found to increase anxiety in children (McMurtry, et al., 1995). Findings such as these continue to suggest children are sensitive to their parents' responses and model similar behavior and coping.

The influential relationship between parents' level of anxiety and children's level of anxiety in the medical setting has consistently been reported over decades (Berenbaum & Hatcher, 1992; Felder-Puig, et al., 2002; Skipper & Leonard, 1968). Our findings further support this and provide new information to the current literature by identifying this relationship in the doctor's office. The medical team can apply this information by recognizing the importance of minimizing parents' anxiety by giving them information, coping promoting roles during the visit, such as providing distraction, and emotional support. Child life specialists are professionals trained in providing families such interventions, and this finding suggests the need for such professionals in the doctor's office.

The children's baseline pulse was related to the nurses' reports of the children's distress (i.e., total anxiety, overall stress, overall pain, and overall difficulty) during triage. Scores of total anxiety, overall stress, overall pain, and overall difficulty are parts of the Nurses' Rating of

Children's Distress Scale (NRCDS). The fact that these variables are all significantly and positively related to the baseline pulse shows that the level of children's anxiety they have coming into the visit is a very strong indicator of their behaviors during the procedures of the doctor's visit. It also suggests the children's initial anxiety is more influential than their anxiety level after the activity since only total anxiety reported by the nurses was related to pulse. Therefore, the initial anxiety may set the tone for children's behaviors during procedures at the doctor's office.

For the children, as pulse increased so did distress behaviors during triage. These findings are congruent with other studies showing that, when children are anxious, they display distress in their behaviors (Lumley, et al., 1993;Visintainer & Wolfer, 1975). Distress behaviors include squirming or kicking with legs, crying, complaining, and grabbing with arms. Katz, et al., (1980) assessed the distress behaviors of children undergoing a medical procedure. Younger children with anxiety were found to display a variety of behaviors while anxious older children were more likely to utilize muscle withdrawal and avoidance during the procedures. Another study found children's anxiety to be displayed as muscle rigidity, cries and screams, and/or verbal expressions of discomfort (Jacobson, et al., 1990). Such behaviors occur because children are worried about undergoing bodily harm, being separated from trusted caregivers, experiencing the unknown, and loss of autonomy (Visintainer & Wolfer, 1975). Distress behaviors may be negative reactions to anxieties about the doctor's visit, which children express in hopes of gaining some control over the situation. If this is the case, methods for reducing anxiety during a doctor's visit should continue to be examined, and effective coping techniques should be provided by a child life specialist in order to decrease the anxiety children have about attending a doctor's visit.

A relationship was also found between the children's fear before the activity and the overall pain the nurses reported the children to experience during triage. This means that children who reported more fear also displayed more pain during triage. Previously, fear has been associated with higher reports of pain during medical procedures for children (Hanas, 2001; Rhudy & Meagher, 2003). For example, one study assessed the effectiveness of distraction for children undergoing a venipuncture procedure. The children's fear was assessed using a visual analogue scale ranging from O (no fear) to 5 (worst fear). Children were asked to report how scared they were during the procedure by pointing to their level of fear. Pain was assessed using another visual analogue scale in the shape of an upside down triangle, with no pain represented at the narrow end and worst pain at the wide end, immediately after the procedure with children pointing to their level of pain. Children who reported more fear during the procedure also reported more pain (Windich-Biermeier, et al., 2007). In these studies, it is likely that fearful children were worried about the possibilities of undergoing procedures (i.e., immunizations, physicals), and as a result of their anticipation of impending pain or harm, the children viewed any procedure as painful. Therefore, it is important to provide children with opportunities that decrease fear in the doctor's office, such as a video providing information about the medical setting. This in turn may decrease the pain children express during procedures.

Limitations

One limitation of this study was the time constraint on the activities. The activities took place while the children were waiting to be taken to a patient room for the doctor's visit. On average, most of the children were in the waiting room for 10 to 12 minutes before they were called back to a patient room. In order to minimize disruption of the clinic, we worked in this time frame. The few previous studies that found positive effects for medical play in the medical

setting entailed a 30 to 45 minute medical play session (Bloch & Toker, 2008; Ellerton, et al., 1985; McGrath & Huff, 2001). It takes time for children to develop their play ideas and move through them fully, and the benefits of play can be inhibited if amble time is not provided (Hendrick & Weissman, 2011). Therefore, children may not have had enough time to initiate, engage, and finalize play, especially those in the medical play group that were expressing more fears. Future studies are needed to examine the effects of time on the benefits of medical play in the doctor's office to better determine if medical play is not effective at the doctor's office because of a time constraint.

A second limitation to this study is the use of a structured typical play activity. The typical play activity was a developmental board game. Although research has shown board games to be effective psychosocial tools that allow children to express themselves, learn to manage behaviors, and cope with anxieties (Matorin & McNamara, 1996; Oren, 2008; Wilde, 1994), a non-structured play activity, such as blocks, might have served as a better comparison to the child-directed activity of medical play. The medical play activities were led by the children. They explored the items how they wanted to and in whatever manner they wanted. In the board game, children were limited in their choices and abilities to manipulate the materials in any manner. Activities with the least amount of structure and control by the adult are the activities that allow for the most self-expression (Hendrick & Weissman, 2011). Therefore, a non-structured activity, such as blocks, would have allowed the children to lead the activity and would have provided the most amount of self-expression. A non-structured activity and the medical play activity would have been more similar, and therefore, might have allowed us to better compare medical play and typical play. With this in mind, this study should be replicated

with the use of a non-structured typical play activity to see if it is beneficial at the doctor's office.

Conclusion and Implications

In summary, our findings showed that viewing a medical information video may be the most effective activity at minimizing anxiety, fear, and procedure distress for children visiting the doctor. Typical play activities were also found to be effective in minimizing procedure distress. In the pediatrician's office, it appears that children benefit more from obtaining information through medical play than the actual hands on manipulation of medical items. Time may inhibit the effectiveness of hands on manipulation of medical equipment in the fast pace of the doctor's office. While the findings need to be replicated, they imply that the best way to provide for the psychosocial needs of patients at a pediatrician's office may be to provide information through a video of a child engaging in medical play and sharing information about medical equipment.

REFERENCES

Alpern, G.D. (2007). *Developmental Profile 3: DP-3*. Los Angeles, CA: Western Psychological System.

American Academy of Pediatrics (2006). Policy statement: Child life services. *Pediatrics, 114*(4), 1757-1763.

Athanassiadou, E. Tsiantis, J., Christogiorgos, S., & Kolaitis, G. (2009). An evaluation of the effectiveness of psychological preparation of children for minor surgery by puppet play and brief mother counseling. *Psychotherapy and Psychosomatics, 78*(1), 62-63.

Axline, V. (1969). *Play therapy.* New York, NY: Ballantine.

Barkey, M.E. & Stephens, B. (2000). Comfort measures during invasive procedures: The role of the child life specialists. *Child Life Focus, 2*(1), 1-4.

Barnett, L. (1984). Research note: Young children's resolution of distress through play. *Journal of Child Psychology and Psychiatry, 25*(3), 477-483.

Barnett, L. & Storm, B. (1981). Play, pleasure, and pain: The reduction of anxiety through play. *Leisure Sciences, 4*(2), 161-175.

Berenbaum, J. & Hatcher, J. (1992). Emotional distress of mothers of hospitalized children. *Journal of Pediatric Psychology, 17*(3), 359-372.

Bettelheim, B. (1987). The importance of play. *Atlantic Monthly,* 35-46.

Bloch, Y. & Toker, A. (2008). Doctor, is my teddy bear okay? The "Teddy Bear Hospital" as a method to reduce children's fear of hospitalization. *Israel Medical Association Journal, 10*(8-9), 646-647.

Bolig, R. (1990). Play in health care settings: A challenge for the 1990's. *Children's Health Care, 19*(4), 229-233.

Bolig, R., Yolton, K., & Nissen, H. (1991). Medical play and preparation: Questions and issues. *Children's Health Care, 20*(4), 225-229.

Burnstein, S. & Meichenbaum, D. (1979). The work of worrying in children undergoing surgery. *Journal of Abnormal Child Psychology, 7*(2), 121-132.

Carroll, M. & Ryan-Wenger, N. (1999). School-age children's fears, anxiety, and human figure drawings. *Journal of Pediatric Health Care, 13* (1), 24-31.

Clatworthy, S. (1981). Therapeutic play: Effects on hospitalized children. *Journal of Association for Care of Children's Health, 9*(4), 108-113.

Clatworthy, S., Simon, K., & Tiedeman, M. (1999a). Child drawing: Hospital- An instrument designed to measure the emotional status of hospitalized school-aged children. *Journal of Pediatric Nursing, 14*(1), 2-9.

Clatworthy, S., Simon, K., & Tiedeman, M. (1999b). Child drawing: Hospital manual. *Journal of Pediatric Nursing, 14*(1), 10-18.

Cohen, L., Blount, R., & Panopoulos, G. (1997). Nurse coaching and cartoon distraction: An effective and practical intervention to reduce child, parent, and nurse distress during immunizations. *Journal of Pediatric Psychology, 22*(3), 355-370.

Dahlquist, L., Pendley, J., Landthrip, D., Jones, C., & Steuber, C. (2002). Distraction intervention for preschoolers undergoing intramuscular injections and subcutaneous port access. *Health Psychology, 21*(1), 94-99.

Das, D., Grimmer, D., Sparnon, A., McRae, S., & Thomas, B. (2005). The efficacy of playing a virtual reality game in modulating pain for children with acute burn injuries: A randomized controlled trial. *BMC Pediatrics, 5* (1), 1-10.

Ellerton, M.L., Caty, S., & Ritchie, J. (1985). Helping young children master intrusive procedures through play. *Children's Health Care, 13*(4), 167-173.

Farquhar, S. (1983). A study in the relationship of anxiety in children in a school setting and children in a hospital setting, ages 5-11. (Unpublished master's thesis). Wayne State University: Detroit, MI.

Farver, J., Kim, Y., & Lee-Shin, Y. (2000). Within cultural differences: Examining individual differences in Korean American and European American preschoolers' social pretend play. *Journal of Cross-Cultural Psychology, 31*(5), 583-602.

Fedler-Puig, R., Maksys, A., Noestlinger, C., Gardner, H., Stark, H., Pfluegler, A., & Topf, A. (2003). 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, 67*(1), 35-41.

Fisher, E. (1992). The impact of play on development: A meta-analysis. *Play and Culture, 5*(2), 159-181.

French, G., Painter, E., & Coury, D. (1994). Blowing away shot pain: A technique for pain management during immunizations. *Pediatrics, 93*(3), 384-388.

Frost, J. (2005). Lessons from disasters: Play, work, and the creative arts. *Childhood Education, 82*(1), 2-8.

Gariepy, N. & Howe, N. (2003). The therapeutic power of play: Examining the play of young children with leukemia. *Child: Care, Health, and Development, 29*(6), 523-537.

Garvey, C. (1977). *Play*. Cambridge, MA: Harvard University Press.

Goodenough, B. & Ford, J. (2005). Self-reported use of humor by hospitalized pre-adolescent children to cope with pain-related distress from a medical intervention. *Humor, 18*(3), 279-298.

Hart, D. & Bossert, E. (1994). Self-reported fears of hospitalized school-aged children. *Journal of Pediatric Nursing, 9*(2), 83-90.

Hatava, P., Olsson, G., & Lagerkranser, M. (2000). Preoperative psychological preparation for children undergoing ENT operations: A comparison of two methods. *Pediatric Anesthesia, 10*(5), 477-486.

Hanas, R. (2001). Reducing injection pain in children and adolescents with type 1 diabetes: Studies on indwelling catheters and injection needles. (Unpublished doctoral dissertation). Faculty of Health Sciences: Sweden.

Hendrick, J. & Weissman, P. (2011). *Total Learning: Developmental Curriculum for the Young Child.* New York, NY: Pearson.

Hoffman, I. & Futterman, E. (1971). Coping with waiting: Psychiatric intervention and study in the waiting room of a pediatric oncology clinic. *Comprehensive Psychiatry, 12*(1), 67-81.

Hollingshead, A. (1975). Four-factor index of social status. Unpublished working paper. Yale University, New Haven, CT.

Holzheimer, L., Mohay, H., & Masters, B. (1998). Educating young children about asthma: Comparing the effectiveness of a developmentally appropriate asthma education video tape and picture book. *Child: Care, Health, and Development, 21*(1), 85-99.

Ispa, J., Barrett, B., & Kim, Y. (1988). Effects of supervised play in a hospital waiting room. *Children's Health Care, 16*(3), 195-200.

Jacobson, P., Manne, S., Gorfinkle, K., Schorr, O., Rapkin, B., & Redd, W. (1990). Analysis of child and parent behavior during painful medical procedures. *Health Psychology, 9*(5), 559-576.

Katz. E., Kellerman, J., & Siegel, S. (1980). Behavioral distress in children with cancer undergoing medical procedures: Developmental considerations. *Journal of Consulting and Clinical Psychology, 48*(3), 356-365.

Kain, Z., Caramico, L., Mayes, L., Genevro, J., Bornstein, M., & Hofstadter, M. (1988). Preoperative preparation programs in children: A comparative examination. *Anesthesia and Analgesia, 87*(6), 2149-1255.

Keck, J., Gerkensmeyer, J., Joyce, B., & Schade, J. (1996). Reliability and validity of the faces and word descriptor scales to measure procedure pain. *Journal of Pediatric Nursing, 11*(6), 368-374.

Kenealy, P. (1989). Children's strategies for coping with depression. *Behavior Research and Therapy, 27*(1), 27-34.

Knell, S. (1998). Cognitive-behavioral play therapy. *Journal of Clinical Child Psychology, 27*(1), 28-33.

Koller, D. (2008). *Child Life Council Evidence-Based Practice Statement: Therapeutic Play in Pediatric Health Care: The Essence of Child Life Practice*. Retrieved June 22, 2010, from: http://www.childlife.org/files/EBPPlayStatement-Complete.pdf.

Lacey, C., Finkelstein, M., & Thygeson, M. (2008). The impact of positioning on fear during immunizations: Supine versus sitting up. *Journal of Pediatric Nursing, 23*(3), 195-200.

Lindsey, E. & Colwell, M. (2003). Preschoolers' emotional competence: Links to pretend and physical play. *Child Study Journal, 33*(1), 39-52.

Loxton, H. (2009). Monsters in the dark and other scary things: Preschoolers' reports. *Journal of Child and Adolescent Mental Health, 100*(2), 47-60.

Lumley, M., Melamed, B., & Abeles, L. (1993). Predicting children's presurgical anxiety and subsequent behavior changes. *Journal of Pediatric Psychology, 18*(4), 481-497.

McCue, K. (1988). Medical play: An expanded perspective. *Children's Health Care, 16*(3), 75-85.

McGrath, P. & Huff, N. (2001). 'What is it?': Findings on preschoolers' responses to play with medical equipment. *Child: Care, Health, and Development, 27*(5), 451-462.

McGrath, P., Johnson, G., Goodman, J., Schillinger, J., Dunn, J., & Chapman, J. (1985). CHEOPS: A behavioral scale for rating postoperative pain in children. In H. Fields, et al, (Eds.), *Advances in Pain, Research, and Therapy*, (Vol 9). New York, NY: Haven Press.

Matorin, A. & McNamara, J. (1996). Using board games in therapy with children. *International Journal of Play Therapy, 5*(2), 3-16.

McMurtry, M., Chambers, C., McGrath, P., & Asp, E. (2010). When "don't worry" communicates fear: Children's perceptions of parental reassurance and distraction during a painful medical procedure. *Pain, 150*(1), 52-58.

Midori Entertainment. (Producer). (2008). *Animal atlas: Animal passport* [DVD]. Available from http://NCircleEntertainment.com.

Moore, M. & Russ, S. (2006). Pretend play as a resource for children: Implications for pediatricians and health professionals. *Journal of Developmental and Behavioral Pediatrics, 27*(3), 237-248.

Nelson, C. & Allen, J. (1999). Multimedia computer instruction in pediatric psychology. *Children's Health Care, 28*(1), 1-13.

Ollendick, T & King, N. (1991). Origins of childhood fears: An evaluation of Rachman's theory of fear acquisition. *Behaviour Research & Therapy, 29*(2), 117-123.

Oremland, E. (1988). Mastering developmental and critical experiences through play and other expressive behaviors in childhood. *Children's Health Care, 16*(3), 150-156.

Oren, A. (2008). The use of board games in child psychotherapy. *Journal of Child Psychotherapy, 34*(3), 364-383.

Parten, M. (1932). Social participation among pre-school children. *Journal of Abnormal and Social Psychology, 27*(3), 243-269.

Piaget, J. (1970). Piaget's theory. In P.H. Mussen (3rd ed.), *Carmichael's Manual of Child Psychology.* New York, NY: Wiley.

Rollins, J., Bolig, R., & Mahan, C. (2005). *Meeting Children's Psychosocial Needs.* Austin, TX: Pro-ed.

Rozanski, A. & Kubzansky, L. (2005). Psychological functioning and physical health: A paradigm of flexibility. *Psychosomatic Medicine, 67*(S1), 47-53.

Rubin, K., Watson, K., & Jambor, T. (1978). Free-play behaviors in preschool and kindergarten children. *Child Development, 49*(3), 534-536.

Rhudy, J. & Meagher, M. (2003). Negative affect: Effects on an evaluative measure of human pain. *Pain, 104*(3), 617-626.

Salmela, M., Salantera, S., Ruotsalainen, T., & Aronen, E. (2010). Coping strategies for hospital-related fears in pre-school-aged children. *Journal of Pediatrics and Child Health, 46*(3), 108-114.

Salmon, K. & Pereira, J. (2002). Predicting children's response to an invasive medical investigation: The influence of effortful control and parent behavior. *Journal of Pediatric Psychology, 27*(3), 227-233.

Schaefer, C. & Reid, S. (1986). The psychology of play and games. In C. Schaefer & S. Reid (Eds.), *Game play: Therapeutic use of childhood games.* New York, NY: John Wiley & Sons.

Shandor, M., Burchinal, P., Holditch-Davis, D., Brunssen, S., & Wilson, S. (2002). Perceptions of stress, worry, and support in black and white mothers of hospitalized, medically fragile infants. *Journal of Pediatric Nursing, 17*(2), 82-88.

Skipper, J. & Leonard, R. (1968). Children, stress, and hospitalization: A field experiment. *Journal of Health and Social Behavior, 9*(4), 275-287.

The Cleveland Clinic (2010). *Pulse and Target Heart Rate.* Retrieved February 24, 2010, from: http://my.clevelandclinic.org/heart/prevention/exercise/pulsethr.aspx.

Urbaniak, G. & Plous, S. (2010). *Research Randomizer*. Retrieved August 18, 2010, from: http://www.randomizer.org.

Vessey, J. & Mahon, M. (1990). Therapeutic play and the hospitalized child. *Journal of Pediatric Nursing, 5*(5), 328-331.

Visintainer, M. & Wolfer, J. (1975). Psychological preparation for surgical pediatric patients: The effects on children's and parent's stress responses and adjustment. *Pediatrics, 56*(2), 187-202.

Webb, J. (1995). Play therapy with hospitalized children. *International Journal of Play, 4*(1), 51-59.

Wennstrom, B., Hallberg, L., & Bergh, I. (2008). Use of perioperative dialogues with children undergoing day surgery. *Journal of Advanced Nursing, 62*(1), 96-106.

Wilde, J. (1994). The effects of the Let's Get Rational board game on rational thinking, depression, and self-acceptance in adolescents. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 12*(3), 189-196.

Williams, Y. & Powell, M. (1979). Documenting the value of supervised play in a pediatric ambulatory care clinic. *Children's Health Care, 9*(1), 15-20.

Windich-Biermeier, A., Sjoberg, I., Conkin Dale, J., Eshelman, D., & Guzzetta, C. (2007). Effects of distraction on pain, fear, and distress during venous port access and venipuncture in children and adolescents with cancer. *Journal of Pediatric Oncology Nursing, 24*(1), 8-19.

Wong, D. & Baker, C. (1988). Pain in children: Comparison of assessment scales. *Pediatric Nursing, 14*(1), 9-17.