

MEDICAL PREPARATION AS AN INTERVENTION TO REDUCE
SCHOOL AGE CHILDREN'S MEDICAL EXAM DISTRESS
IN THE PRIMARY HEALTHCARE SETTING

by

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ABSTRACT

Children frequently experience anxiety when in a medical setting, which can have both short and long term negative psychological consequences. To reduce these negative repercussions, medical preparation programs have been developed to address and avoid procedural fear and anxiety in the pediatric population. These medical preparation programs have also been shown to counteract short term anxieties and possible long term negative effects. While most medical preparation programs are aimed at hospital patients, the current study targeted school age children visiting a pediatrician at a university clinic. The purpose of this study was to determine whether receiving medical preparation by a Certified Child Life Specialist resulted in less anxiety, fear, and procedural distress for children visiting a pediatrician compared to children who did not receive preparation. Thirty-six pediatric patients, ages 5 ½-12 years of age, were randomly assigned to one of two groups: one group receiving medical preparation by a Certified Child Life Specialist (experimental group), and the other group spent time watching an age appropriate video on animal life (control group). The medical preparation group showed decreased levels of fear and anxiety, while the unprepared children in the control group showed higher levels of anxiety.

LIST OF ABBREVIATIONS AND SYMBOLS

ANOVAS	a statistical method for making simultaneous comparisons between two or more means
BOS	Behavior Observation Scale
CD:H	Child Drawing: Hospital
CHEOPS	Children's Hospital Eastern Ontario Pain Scale
<i>df</i>	Degrees of freedom: one of the independent unrestricted random variables constituting a statistic
DP-3	Developmental Profile 3
F	Anova test value
M	Mean: the sum of a set of measurements divided by the number of measurements in the set
NRCDS	Nurses Rating Of Child's Distress Scale
NS	Not Significant
p	Probability associated with occurrence under the null hypothesis of a value as extreme or more extreme than the observed value
SD	Standard Deviation: A measure of the variability of a distribution of scores
<i>t</i>	Computed value of <i>t</i> test
X^2	Chi Square: A statistic used to compare frequencies of two or more groups
Z	a measure that quantifies the distance a data point is from the mean of a data set

< Less than

= Equal to

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INTRODUCTION

Numerous studies have shown that invasive medical procedures can be emotionally devastating for children in medical settings (Li & Lam, 2003; Visintainer & Wolfer, 1975; Ziegler & Prior, 1994). Pediatric patients are especially vulnerable during the medical experience for reasons including (1) physical harm; (2) fear of separation; (3) fear of the unknown; (4) perceived loss of control; and (5) uncertainty about the future (Brewer, Gleditsch, Syblik, Tietjens & Vacik, 2006; Visintainer & Wolfer, 1975). If these pediatric concerns are not minimized, or at least addressed before, during, or after the medical encounter, children will likely be placed under varying degrees of stress and anxiety during their health care experience (Li & Lopez, 2008).

STRESS, COGNITIVE APPRAISAL AND PSYCHOLOGICAL UPSET

Stress in early childhood is not without consequences. Two distinct categories of stressors have been identified in children: normative and nonnormative (Berk, 1997). Normative stressors are considered common developmental stressors (e.g., physical maturation) while nonnormative stressors appear from traumatic or unusual circumstances (e.g, hospitalization and serious illness).

Originally, studies pertaining to stress identified how individuals were able to effectively handle stress. Lazarus's work in 1966 was the beginning of a new stress theory that examined the stimulus response perspective to a process of teaching the individual how to psychologically cope before a stressful event (Lazarus, 1966). Stressors may be social, cultural, physiological, or a combination of events for the individual (Lazarus & Folkman, 1984). The way an individual

interprets a stressor, that is whether the stressor is perceived as positive or negative, as well as what the individual thinks caused the situation is referred to as cognitive appraisal. More specifically, cognitive appraisal is an individual's ability to evaluate, assess, and make a mental judgment on whether or not a situation is stressful (Walker, Wells, Heiney & Hymovich, 2002). One intervention, known as medical preparation, which is designed to give children in healthcare environments specific information before they are placed in the possibly stressful situations, has been reported to decrease children's stress and anxiety.

When children do not cope well with a stressor, they experience "psychological upset", which is often first manifested while in a medical setting, and may continue to be expressed when they return home (Visintainer & Wolfer, 1975). Psychological upset may be manifested in numerous ways including depression, anxiety, denial, physical manifestations, temperament changes, as well as various other indicators (Vernon, Schulman & Foley, 1966). Numerous studies examining children in a hospitalized setting have shown that children experience psychological upset in greater numbers and degree than children in alternate, more familiar environments (Li & Lopez, 2008). Hospitalized children also exhibit lower levels of self-esteem and higher amounts of internalized fears (Meng, 1980; Ziegler & Prior, 1994). Multiple factors have been reported to affect pediatric patients' psychological adjustment to medical encounters, including previous hospital experiences, age, developmental level, and prior experiences with the medical profession (Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998; Ziegler & Prior, 1994).

To minimize psychological upset in pediatric patients, developmentally appropriate procedural preparations/interventions were developed (Francis & Cutler, 1957; Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998). The main goal of preparation interventions is to reduce the fear and anxiety experienced by children who are undergoing a medical procedure and encourage long term adjustment to future health care challenges (Edwinson, Arnbjornsson & Ekman, 1988; Lynch, 1994; Melamed & Siegel, 1975). The lasting effects of anxiety due to even minor medical procedures can be profound, including eating and sleeping changes, separation anxiety, decreased cooperation, increased fears, and increased anxiety in children even after the procedure has been completed (Roberts, Wurtele, Boone, Ginther & Elkins, 1981; Tiedeman & Clatworthy, 1990; Vernon, Schulman & Foley, 1966).

REDUCING ANXIETY THROUGH INTERVENTION

There have been multiple studies examining the effects of medical preparation on children's anxiety levels. A study conducted by Schwartz, Albina, and Tedesco (1983) specifically examined the use of play therapy to educate and inform children about their upcoming procedures. The study's results indicated that play therapy, specifically before anesthesia, helped alleviate many of the negative responses that pediatric patients previously reported, such as fear and anxiety. Therapeutic play consists of specialized activities that are developmentally supportive and assist in the emotional well being of a pediatric patient (Vessey & Mahon, 1992).

Procedural preparation has also been shown to limit both the long and short-term effects of medical encounters, and immediately reduce anxiety experienced by the patients (Gaynard,

Wolfer, Foldberger, Thompson & Redburn, 1998; Roberts, Wurtele, Boone, Ginther & Elkins, 1981). Procedural preparation helps facilitate coping in patients and utilizes a variety of methods to assist in optimal comprehension of procedures. Although in the United States, multiple medical facilities employ preparation programs, their methods of preparing the patient are vastly different. Methods of preparation, for example, include, but are not limited to filmed modeling, role rehearsal/reversal, therapeutic play, teaching coping and relaxation skills, educational videos, books and pamphlets and operating room tours, as well as other methods specifically designed to lessen pediatric patients' anxiety and negative responses to medical circumstances (Cassell, 1965; Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998; Hatava, Olsson & Lagerkranser, 2000; Melamed & Ridley-Johnson, 1988).

Therapeutic play consists of at least one of the following types of activities: 1) support of emotional expression and encouragement, 2) informational play to educate children regarding medical encounters, and 3) physiologically enhancing play (e.g. blowing a pinwheel to improve breathing) (Vessey & Mahon, 1992). Li and Lopez (2008) conducted a study examining the use of therapeutic play in preparing children ages 7-12 for surgery. A randomized controlled trial was employed with 203 children admitted for surgery. The experimental group of this study was provided medical play specifically, play pertaining to their upcoming anesthesia induction. This intervention consisted of children and their parents receiving a preoperative tour visit to the operation room, a doll demonstration by the researcher, and a return demonstration by the children on preoperative procedure. The demonstration and return demonstration focused primarily on anesthesia induction. The medical play group displayed significantly lower state

anxiety scores in the preoperative period and the postoperative period compared to the control group.

Additionally, a pre-procedural study by Visitainer and Wolfer (1975) examined various preparation types for surgical procedures: 1) rehearsal, where the children often take the role of the healthcare professional, 2) preparation, providing clear and accurate medical information to the child about the upcoming procedure, and 3) supportive care measures to alleviate anxiety in pediatric patients. Eighty-four children, aged 3-12, admitted for tonsillectomies were randomly assigned to one of three treatments conditions or to a control group. By utilizing these three measures in a pre-procedure preparation, the participants exhibited fewer signs of anxiety and apprehension before the procedure, and were also more cooperative with the medical team throughout their hospitalization.

Edwinson, Arnbjornsson, and Ekman (1988) assessed psychological preparation prior to emergency surgery in children ages 5 to 14. This study utilized two randomized groups of patients to determine whether specific information preceding an emergency operation would reduce anxiety and fear in the pediatric patients. One group was given very basic information about what was occurring during their procedure while the other group was given very specific, detailed information regarding their emergency surgery. The study found that children who received specific information concerning their surgery exhibited far less anxiety than the children who were only given general information about the procedure.

Campbell, Berry, and Lamberti (1995) conducted a similar study associating the amount of information provided and the anxiety of the pediatric patient. However, instead of providing

the experimental group specific verbal information, the researchers demonstrated the surgical procedure the child was scheduled to receive on a stuffed doll. Additionally, the sensations the child might experience before and after the procedure were explained to the child. This demonstration was also accompanied by a hospital tour by members of the medical team, and the teaching of individualized and appropriate coping skills for each patient. The study found that patients who received the additional and more detailed information exhibited fewer negative behaviors during hospitalization as well as after returning home.

A comparable research study conducted by Havata, Olsson, and Lagerkranser (2000) included children aged 2-10. In this study, the control group was given the standard level of care from their health care providers. The experimental group received the same amount and type of information as the control group, in addition to a group teaching session that included role playing practices by the patients, introduction to the pediatrics medical team, and hands on manipulation of the medical equipment. The child's procedure was also demonstrated on a doll for the experimental group to gain better comprehension by the pediatric patients. The results of this study, again, showed that children who received numerous preparation methods gained a better sense of understanding about their procedure and exhibited decreased levels of anxiety than children who received no preparation. One problem with this study is that it implemented a self-rating style of questionnaire to assess children and parent's emotional experience of premedication and didn't employ any behavioral methods for the younger age set participating in the study, which included children as young as age 2.

These and multiple other studies demonstrate that medical preparation programs that provide accurate, developmentally appropriate medical information may help children cope better with the medical experience, both in the short and long term (Child Life Council, 2006; Edwinston, Arnbjornsson & Ekman, 1988; Melamed & Siegel, 1975, Zahr, 1998; Skipper & Leonard, 1968; Wolfer & Visintainer, 1979). However, each of these studies had methodological flaws, such as a lack of randomization, using multiple procedures, small sample sizes and particularly young participants, a lack of control group in certain studies, confounds, and one-sided information delivery.

ENHANCING CHILDREN'S COPING

Studies have shown that the information provided about the medical procedure should be as specific as possible as opposed to a more generalized overview. Providing specific procedural information has been shown to lessen negative behavior and encourages faster recovery post-operatively while addressing children's fears and anxieties (Edwinston, Arnbjornsson & Ekman, 1988; Lynch, 1994; Wolfer & Visintainer, 1979). In addition, alongside the procedural preparation process, coping strategies targeted to reducing fear and anxiety should be discussed.

When preparation programs discuss and practice coping strategies before surgery, school age children show favorable behavioral outcomes as well as reduced anxiety (Campbell, Kirkpatrick, Berry & Lamberti, 1995). Furthermore, when children age 2-10 receive modeling techniques in addition to coping strategies, they were more cooperative and less anxious than when they received only one form of preparation (Peterson & Shigetomi, 1981). However, these coping and modeling techniques should be tailored to fit the developmental, as well as medical,

needs of the patients. The benefits of procedural preparation with children extend throughout the health care team. By providing preparation programs, children are able to gain a more trusting relationship with the medical staff (Melamed & Ridley-Johnson, 1988). By offering specific information tailored to meet the needs of each child, a coping strategy set in place during the procedure, and clearing up any misconceptions the child previously held, the child gains a better understanding of the necessity of the medical encounter and is better able to emotionally cope with the situation.

AGE AND ANXIETY IN MEDICAL SETTINGS

There has also been speculation on the age group that may experience the most anxiety during medical encounters. While a study by Hathaway (1999) suggests that there is no known age that is best for medical preparation, he does suggest that if a child is verbal and is able to understand what is being said, he/she should be considered a priority for preparation. However, many argue that it is the preschool and school age children that are most at risk for psychological upset due to their very active imagination and tendency to use “magical thinking” to explain events while in the hospital (Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998; Stewart, Algren & Arnold, 1994). Magical thinking is an inaccurate belief that one’s thoughts, words, or actions will cause or prevent a specific outcome that does not demonstrate a realistic relationship between cause and effect (Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998). Preschool and school age children are particularly susceptible to hold misconceptions about medical procedures due to a lack of understanding and the usage of fantasy thinking (Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998).

Common fears for preschool and school age children are: separation from parents, fears of mutilation, fear of pain and shots, and a misconception that hospitalization is a punishment for something they did wrong (Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998). Therefore, it is essential to provide these children with accurate, complete, and developmentally appropriate information to include both what will happen and why it will happen in terms the children can understand. In addition, explanations should include sensations that the child can expect to experience, such as what the operating room or the instruments that will be used on them might look or feel like, what the drugs or medicines that will be applied will smell like or feel like, etc., (Koller, 2007). By providing developmentally appropriate medical preparation for this at risk population, it will likely result in the reduction of potential misconceptions that may lead to psychological upset.

The Current Study

Although there has been advancement in pediatric care in recent years, there has been little research that has methodically and scientifically tested medical preparations' effectiveness in pediatric patients. The majority of research that is currently circulating has rated children's anxiety levels by observational measures or by parental Likert and rating scales (Hatava, Olsson & Lagerkranser, 2000; Prugh, Staub, Sands, Kirsehbaum & Lenihan, 1953; Schmidt, 1990). Moreover, studies in the literature have shown numerous methodological flaws. One of these flaws include a lack of a viable control group to compare measures to one another, as well as a feasible way to determine exactly which intervention was optimal or whether it was a combination of treatments that have proven to be a more effective intervention. Since numerous

studies employed a system of exposing participants to various interventions and rarely methodically tested for only one procedure or factor at a time, it is difficult to determine which intervention was actually the most optimal.

Also, there are very few studies that use pediatric self-report measures to gauge the patient's anxiety levels both before, as well as after their medical experiences (Francis & Cutler, 1957; Schwartz, Albina & Tedesco, 1983). The current thesis is unique to this emerging field of research because it utilizes two child-directed measures to assess children's worries as well as employs physiological measures and behavioral rating scales conducted before and after the child's medical encounter. Furthermore, while there is a growing amount of research being done in the field of pediatrics to prepare children in a hospitalized setting, there is very limited research being done in a primary health care setting. This study will assess whether pre-procedural interventions conducted by a Certified Child Life Specialist prior to children's medical examination in a primary health care setting are effective in reducing anxiety and fears in school-age children.

Two stressors that children may face when visiting their pediatrician are fear of receiving a shot and anxiety about the overall medical examination. We examined if we could reduce children's fear and anxiety associated with the visit to the pediatrician. Fear was measured through a child self-report scale. Anxiety was measured by the child's increased or decreased pulse rate post intervention and post doctor's examination as well as the Child Drawing: Hospital measure administered post doctors examination. School age children in the study were randomly

assigned to a medical preparation (intervention) group or to a (control) group that watched a nature video.

Hypotheses

In agreement with current literature, it is anticipated that children receiving medical preparation (intervention group) by a Certified Child Life Specialist at a pediatric clinic will show decreased anxiety, fear, and distress when compared to children who watched a video (control group). In contrast to current literature, this study utilized self-report measures in addition to behavior observational measures. Furthermore, a Certified Child Life Specialist conducted the current study at a primary physician's office to examine the effects of receiving medical preparation in this setting as opposed to a hospitalized setting.

Hypotheses

1. Compared to children in the control group, children receiving medical preparation by a Certified Child Life Specialist will exhibit less distress as indicated by lower scores on the Behavior Observation Scale (BOS) post intervention and post doctor's visit, as well as lower scores on the Nurses' Rating of Children's Distress Scale (NRCDS) after their preliminary health screening.
2. Compared to children in the control group, children receiving medical preparation by a Certified Child Life Specialist will exhibit decreased fear indicated by a lower score on the Fear-o-Meter post intervention and post medical examination.
3. Compared to children in the control group, children receiving medical preparation by a Certified Child Life Specialist will exhibit decreased anxiety as indicated by a lower

score on the Child Drawing: Hospital measure following their medical examination, as well as a lower pulse rate post intervention and post medical examination.

METHOD

Study Overview

Adults with children who appeared to be of school age were approached in the waiting room of the General Pediatric Clinic of the University of Alabama's Medical School in Tuscaloosa, Alabama. School age children between the ages of 5 ½ to 12, and their primary caregivers were recruited for the study. All children who participated in the study first received the intervention (medical preparation) or control session (animal video), then were given a preliminary health screening by a nurse (triage), and finally examined by a pediatrician at the clinic. Children in the intervention group were expected to self-report and display less anxiety, fear, and procedure distress related to the two medical stressors (i.e. the nurse's screening and the physical examination by the pediatrician). The parents, or primary caregivers, were consented and the children were assented. The children were randomly assigned into either a medical preparation group, or a non-preparation control group, which watched an animal video. Each group (i.e. medical preparation and nature video) lasted 10 minutes. The medical preparation and the nature video sessions were conducted in the same room to control for the setting and to minimize distractions.

Participants

Thirty-six children (M age = 8.6, SD=2.1) participated in the study. The children in the medical preparation group did not differ from children in the control group on background demographic variables (see Table 1).

Table 1. Demographic questionnaire, Developmental Profile-3, and Background Questions for the Medical Preparation group versus the Nature Video control group (standard deviations in parentheses).

Variables	Medical Preparation	Video Control	Z	F	χ^2	<i>p</i>
<u>Children</u>						
Age	8.65 (2.12)	8.64(2.01)		.000		NS
DP-3	8.63 (2.52)	9.31 (2.3)		.710		NS
Gender					.740	NS
Male	8	9				
Female	10	9				
Race					.240	NS
White	10	9				
Black	5	9				
Hispanic	1	0				
Biracial	1	0				
Reason for seeing the doctor today					4.13	NS
Checkup	8	9				
Illness	7	8				
Immunizations	1	0				
Follow up	0	1				
ADHD	2	0				
Immunization during visit					.364	NS
Yes	1	2				
No	17	16				
Has your child been hospitalized before					.380	NS
Yes	9	6				
No	9	11				

Variables	Medical Preparation	Video Control	Z	F	χ^2	<i>p</i>
Do you talk to your child about going to the doctor					.546	NS
Yes	17	16				
No	1	2				
How worried are you now about this doctor's visit			.964			NS
None	13	16				
A little	5	2				
A lot	0	0				
How worried do you think your child is about this doctor's visit			.766			NS
None	8	12				
A little	7	6				
A lot	3	0				
<u>Parent</u>						
Socioeconomic status					.541	NS
Upper	1	0				
Upper Middle	2	3				
Middle	6	3				
Lower Middle	4	7				
Lower	4	5				
Mother						
Age	36.8(7.89)	33.0(6.6)		2.35		.13
Ethnicity					.247	NS
White	10	8				
Black	6	9				
Hispanic	2	0				

Variables	Medical Preparation	Video Control	Z	F	χ^2	p
Father						
Age	38.8(11.19)	35.4(7.4)		.700		NS
Ethnicity						
White	8	6				
Black	7	6				
Hispanic	1	1				

Study Groups/Interventions

Participants assigned to the medical preparation group were shown safe, authentic medical supplies such as a stethoscope, otoscope (instrument to look in the ear), tongue depressor, blood pressure cuff, and bandages. A researcher presented a doll for demonstration and asked the child appropriate questions regarding each medical supply to gauge what the child already understood about the function of each medical piece. The researcher addressed each question using developmentally appropriate responses and corrected any misconceptions the child had expressed regarding the medical item. This intervention lasted 10 minutes and was led by the investigator, who is a Certified Child Life Specialist, by telling the child specifically about each medical piece, as opposed to allowing the child to direct the session or play freely with the materials. Prior to, and after, the medical preparation session the child's pulse was recorded, and the child was asked to rate his/her fear level by pointing to faces on a fear scale.

Participants assigned to the control group watched a Mutual of Omaha Wild Kingdom DVD video on a laptop computer with a set of provided headphones to minimize sound distractions. This DVD was developmentally appropriate for school-age children and discussed a

variety of African safari animals. Once the child's pulse and Fear-o-Meter scores were recorded the participants watched approximately 10 minutes of the animal video, which correlates to one chapter of the DVD. Children's pulses were again taken after watching the DVD.

Measures

The caregivers, children, nurses, and researchers completed the following assessments.

I. Parent/Caregiver Scales

1) Background/Demographic Questionnaire

This questionnaire asked information concerning the caregiver's age, ethnicity, levels of education, and occupation. In addition, the questionnaire asked about the child's age, gender, reasons for seeing the doctor, previous hospitalizations, and whether or not the parent discusses going to the doctor with the child. The background questionnaire was used to describe the sample, to compare groups at baseline and by gender, and to examine whether "previous hospitalizations" correlated with the assessments.

2) Developmental Profile 3 (DP-3; Alpern, G., 2007)

The Developmental Profile 3 was administered, as an interview style questionnaire, to the parent to assess the child's developmental level. Within each area of development, there are upper and lower limits to ensure that only age appropriate questions are asked. This developmental profile provides insight to the patient's physical, adaptive behavior, social-emotional, communication, and cognitive development to determine if the child is typically developing or is experiencing developmental delays. A completed DP-3 offers five comprehensive measures to score the participant: standard scores, percentile ranks, stanines, age

equivalents, and descriptive ranges. The validity of the DP-3 was based on an average sample of 2,216 typically developing children in the United States, spanning all ethnicity, geographical, and socioeconomic status. Only the cognitive subscale was used in this study to properly evaluate the Child Drawing assessment. Data on the children's cognitive developmental level are presented on Table 1.

II. Child Assessments

1) The Child Drawing

The children were given a standard sheet of clean, white 11-by 8 1/2 inch paper and asked to draw a person visiting the doctor's office. Participants in the current study were asked to draw immediately after the doctor completed their medical examination to assess the effects of the medical preparation (vs. watching the nature video) for reducing children's anxiety. A box of 8 different colored crayons was provided to make their drawings. Since children's artwork provides insight into their personal feelings, fears and apprehensions, their drawings were used to assess their anxiety level in relation to their doctor's visit. The Child Hospital: Drawing (Clatworthy, Simon & Tiedeman, 1999) manual was used to score the artwork and assess the anxiety levels of each patient involved in the study. This manual includes three distinct categories. The first category uses a 1-10 rating scale of 14 items to decipher common anxieties among children. This category looks at specifics in the picture such as colors used in the drawing, who is involved or not involved in the picture, size relation of medical equipment, and where the patient is in relation to the picture, as well as multiple other revealing nuances in the

child's artwork. The second category looks more in-depth at specific concerns and higher anxiety levels among children. For example, more points would be added to the artwork if the patient omitted a body part, the body was distorted, or the body showed exaggeration. Finally, the last category of the manual is an overall rating of the picture by the scorer on a scale of 1-10, with 10 indicating a higher level of anxiety. The sum of the three categories can range from 15-210, with the lower numbers corresponding to lower child anxiety.

The Child Drawing: Hospital study's sample (1999) consisted of 139 children ages 5-11 years old. These children were divided into two groups: the experimental group receiving half an hour of therapeutic play daily from a play therapist, and the control group receiving no play therapy. The Child Drawing: Hospital guidelines were given to parents and children within 24 hours of admission and within 24 hours before discharge from a children's hospital. Research assistants blind to group assignments scored the drawings using the Child Drawing: Hospital Scoring Manual, which was found to be a valid and reliable measure. Drawings typically took 5-10 minutes to complete.

2) Fear-o-meter

A scale to measure children's fear specifically designed for a medical play study was also used in this study (Burns-Nader, 2011). The child was assessed on fearful feelings about the doctor's visit before the intervention or control video, directly after the intervention or control video, and again after being seen by the doctor. Fear was assessed by asking the child to point to one of five basic faces, ranging from a visibly happy smiling face to a noticeably distraught face. A number accompanies each face from 0-5. The 0 corresponds to the smiling, happy face, while

the 5 corresponds to the most upset face. The researcher showed the child the Fear-o-Meter and asked him/her to point to the face that looked like how he/she was feeling right now. To ensure validity the researcher also asked the child “can you tell me about the face you chose?” and recorded their response. A similar measure, the Wong-Baker Faces Pain Scale, has been used in previous studies and is a self-report measure used to assess the intensity of children’s pain by pointing at faces. A study conducted by Garra, Singer, Taira, Chohan, Cordoz, Chisena, and Thode (2009) validated the Wong-Baker Scale in children presented to the emergency department with pain by identifying a corresponding mean value of the visual analog scale for each face of the Wong-Baker Scale. The pain severity ratings on the Wong-Baker Scale proved to be highly correlated with those of the visual analog scale.

Researcher’s Scale

1) Behavior Observation Scale (BOS)

This scale has 15 items in 5 different observable behavior domains. In the current study, a researcher blind to who was assigned to the video control group versus the medical preparation group observed the child three separate times: 1) in the waiting room, 2) directly following the intervention or control video, and 3) after the doctor examined the child. The researcher rated the following categories of the child’s behaviors each time: state, affect, activity, vocalization, fidgeting/squirming. Each category was rated 1-3, with 1 being high, 2 being moderate, and 3 being low. State, affect, activity, and vocalization have an optimal score of 1, or high, while fidgeting/squirming had a reverse optimal score of 3, or low. Previous studies have utilized the Behavior Observation Scale and concluded the validity and reliability of the measure. In each of

these studies a research assistant blind to participant groups coded behavior both before and after intervention or control group. These studies found that by using Cohen's kappa statistic, the measure was concluded as reliable. (Schachner, Field, Hernandez-Reif, Duarte, & Krasnegor, 1998; Field, et al., 1998).

2) Heart Rate-

As another index of child anxiety, a researcher took the child's pulse on three separate occasions: 1) before the intervention or control session, 2) immediately following the conclusion of the intervention or control session, and 3) child has completed the doctor's visit. For the demographic population of 5-1/2 to 12 years of age the typical beats per minute are estimated at 70-100. Higher pulse may be associated with distress as well as with illness.

Nurses' Scales

1) Nurse's Rating of Child's Distress Scale (NRCDS)

Consented nurses were asked to complete an observational scale following their preliminary health screening of the participant (or triage), was conducted after the intervention or control video session, and before the child was seen by their doctor. At the screening, the nurse took the child's blood pressure, temperature, height, weight, and checked the child's vision and hearing. The screening occurred prior to the medical examination by the doctor and took roughly 5-7 minutes. The nurses rated the child's 1) overall level of stress, 2) level of pain experienced, and 3) overall difficulty during their preliminary health screening. Each rating ranged from 0-5, with 0 being very relaxed and easy and 5 being very tense and difficult. Nurses also marked observable behaviors during the screening using the Children's Hospital of Eastern Ontario Pain

Scale including 1) crying (no cry to screaming), 2) facial descriptive (smiling to grimace), 3) verbal descriptive (positive to complaint), 4) torso descriptive (neutral to restrained), 5) touch descriptive (no touching to restrained), and 6) leg descriptive (neutral to restrained).

The Children's Hospital of Eastern Ontario Pain Scale (CHEOPS; McGrath, et al., 1985) is used to code the distress behaviors measured by the nurses. This scale has been used by previous studies and has found a strong correlation between the CHEOPS and nurses' self-report scores of patients' pain (McGrath, et al., 1985). The minimum score on the CHEOPS is a 4 describing the child showed no signs of pain, while the maximum score is 13, and the child showed considerable amounts of pain. The CHEOPS validity was established by comparing self-reported pain with the Visual Analog Scale scores and an appropriate decrease in CHEOPS scores (Hain, 2011).

RESULTS

Chi square, Kolmogorov-Smirnov, and one-way ANOVAs showed that statistically the medical preparation group and the video control groups were similar with respect to age, gender, and race of the children, parents' educational attainment and socioeconomic status, as well as reasons for seeing the pediatrician, medical experiences and worries. This suggests that the groups were homogenous at the start of the study. (see Table 1).

Behavior observations, the child's pulse, and the child's self-reported fear pre and post medical preparation or control and post doctor's visit can be seen on Table 2. The results of the t-tests showed that participants in the medical preparation group exhibited: 1) a decreased score in vocalization from pre-preparation (M=2.35, SD= .43) to post doctors visit (M=1.24, SD=.57); 2) a decreased pulse rate from pre-preparation (M=86.33, SD=7.4) to post preparation (M=82.89, SD=9.11), but an increased pulse rate from post preparation (M=82.89, SD=9.11) to post doctor's visit (M=85.76, SD=8.42); and 3) decreased fear score from pre medical preparation (M=1.61, SD=.70) to post preparation (M=1.22, SD=.43).

Participants in the video control group, however, showed increased state behavior from pre (M=1.28, SD=.58) to post video (M=1.72, SD=.46), and a significant increase in state behavior scores from pre video (M=1.28, SD=.58) to post doctor's visit (M=1.67, SD=.49). Activity scores on the behavior scale also increased for the video control group from pre video (M=1.83,SD= .71) to post video (M=2.22, SD=.65), as well as significantly increased from pre video (M=1.83, SD=.71) to post doctors' visit (M=2.22, SD=.65).

After screening, the nurses completed the Nurses Rating of Child's Distress Scale (NRCDS). ANOVA results showed only one significant difference between the medical preparation group and the video control group, and that was in total leg movement. The medical preparation group had an average leg movement score of 1.33 (.49) while the video control group had an average leg movement score of 1.00(.00), $t(34) = 2.92$, $p = .01$, suggesting that overall the medical preparation group moved their legs more than the control group while the nurses were screening them.

Table 2. Behavioral Observations (BOS), Pulse and Fear responses (Fear-o-meter) pre, during and post doctor's visit for medical preparation versus the control group.

	Medical Preparation			Video Control		
	Pre Preparation	Post Preparation	Post Doctor's Visit	Pre Video	Post Video	Post Doctor's Visit
State	1.44(.62)a	1.29(.47)a	1.41(.51)a	1.28(.58)a	1.72(.46)b*	1.67(.49) b*
Affect	1.59(.51)a	1.50(.51)a	1.47(.62)a	1.56(.51)a	1.56(.51)a	1.50(.51)a
Activity	2.06(.56)a	1.78(.55)a	1.88(.60)a	1.83(.71)a	2.22(.65)b*	2.22(.65)b*
Vocalization	2.35(.43)a	1.5(.62)a,b	1.24(.57)b*	2.28(.75)a	2.22(.647)a	2.28(.669)a
Fidgeting/Squirming	1.22(.43)a	1.50(.62)a	1.24(.56)a	1.44(.71)a	1.33(.69)a	1.22(.55)a
BOS Total	8.56(1.72)a	8.22(1.77)a	8.00(1.50)a	8.28(1.71)a	8.94(1.60)a	8.78(1.73)a
Pulse	86.33(7.40)a	82.89(9.11)b*	85.76(8.42)a*	90.35(11.47)a	91.18(9.57)a	88.00(10.68)a
Fear-O-Meter	1.61(.70)a	1.22(.43)b*	1.35(.79)a,b	1.61(.92)a	1.78(.88)a	1.53(1.13)a

Note: * < .05, A lower score is more optimal.

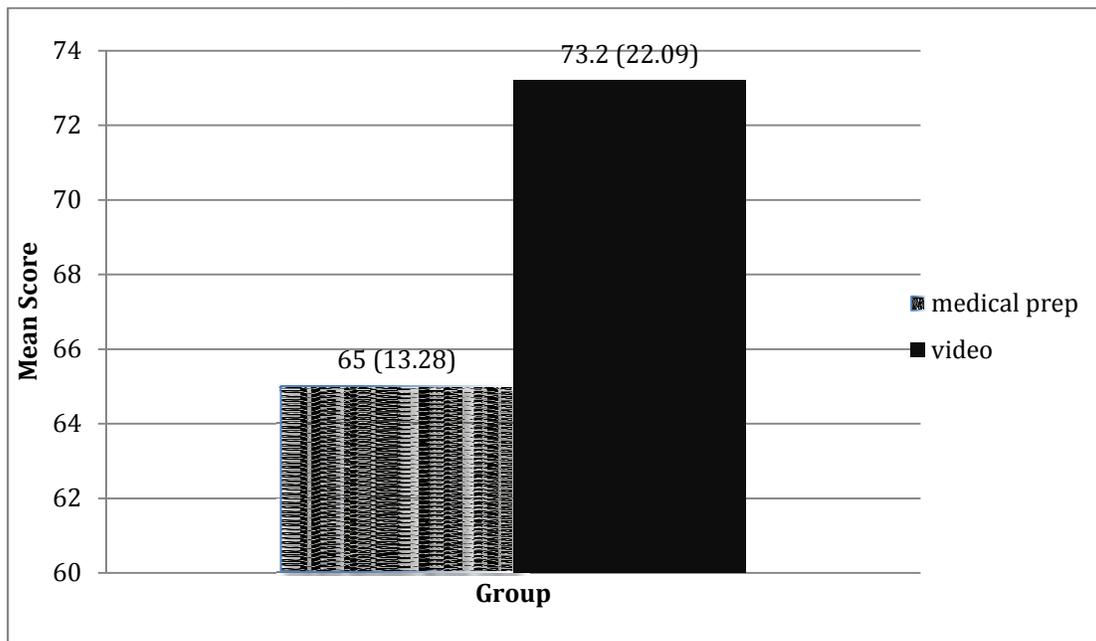
Table 3: Nurses Rating Of Child's Distress Scale (NRCDS) completed after pre-pediatrician examination of vitals and typical growth check.

	Medical Preparation	Video Control	t	p
Overall stress	.56(.78)	.28(.46)	1.30	NS
Overall pain	.11(.32)	.39(1.24)	.92	NS
Overall difficulty	.11(.32)	.00(.00)	1.46	NS
Crying	1.00(.00)	1.00(.34)	1.00	NS
Facial expressions	.33(.61)	.33(.59)	.28	NS
Verbal expressions	.50(.62)	.33(.49)	.76	NS
Torso movement	1.28(.46)	1.06(.24)	1.45	NS
Touch reaching out	1.06(.24)	1.00(.00)	1.00	NS
*Legs movement	1.33(.49)	1.00(.00)	2.92	.01
Total anxiety	5.5(1.69)	4.72(1.18)	1.60	NS

*<.05

The Child Drawing: Hospital (Figure 1) was taken post doctor's visit and an ANOVA showed a trend toward significance for lower anxiety for the medical preparation participants ($F(25) = 3.16, p = .06$ one-tailed). The medical preparation mean score is 65 (SD=13.28) while the video control group is 73.2 (SD=22.09), with a lower score indicating lower anxiety for the participants

Figure 1. Child Drawing: Hospital (CD:H) post doctor's visit drawing for medical preparation versus the control group.



$F=3.16, p = .06$

DISCUSSION

The purpose of this study was to test the effectiveness of medical preparation, a technique used by child life specialists, to help children become ready for a visit with their pediatrician. The study was conducted at a University pediatric clinic. The medical preparation strategy, which was conducted by a child life specialist, included showing school age children safe, authentic medical supplies, such as a stethoscope, otoscope (instrument to look in the ear), tongue depressor, blood pressure cuff, and bandages. A researcher presented a doll for demonstration and asked the child appropriate questions regarding each medical supply to gauge what the child already understood about the function of each medical piece. The researcher addressed each question using developmentally appropriate responses and corrected any misconceptions the child had expressed regarding the medical item. Certified Child Life Specialists are trained in medical preparation in order to decrease fear and anxiety experienced by a child in a medical setting and to promote the child's long-term coping and adjustment to future health care challenges. Medical preparation was expected to reduce children's fears and anxiety associated with being in a medical setting, such as being evaluated by a nurse (e.g., having blood pressure and temperature taken, etc.) and being examined by a pediatrician. A control group of children watching a nature video was included for comparison. Both the medical preparation and the control group were comparable in age, developmental level, background, and medical experiences.

The results of the study indicated that medical preparation may be an effective tool to decrease children's fears and anxieties related to visiting their primary physician. The benefits of psychologically preparing children for a medical visit are similar to those reported by other investigators, such as immediate decreased fears associated with medical procedures (Gaynard, Wolfer, Foldberger, Thompson & Redburn, 1998; Roberts, Wurtele, Boone, Ginther & Elkins, 1981). In the current study, children who received the medical preparation vocalized less and had lower pulse rates after the medical preparation session. In addition, they reported less fear after the medical preparation session.

In contrast, children in the control group who watched a nature video showed increased state changes and were rated as being more active when compared to baseline, after watching the video and after being examined by their doctor. Children in the control group showed no changes in self-reported fear scores after watching the video or after the doctor's visit. These findings may be attributed to the control group's lack of familiarity and understanding of the medical equipment that they saw during the examination given by the pediatrician. This lack of familiarity has been identified as a major stressor for children in earlier literature (Visintainer & Wolfer, 1975). According to Lazarus and Folkman's (1984) theory of cognitive appraisal, stress, and coping, individuals' assessments for a potential threat are influenced by their perception of control over it. Therefore, it was reasoned that if children believe they have adequate control and understanding over the unfamiliar environment and upcoming stressful procedures, their perception of that threat would decrease.

The current study also showed that children receiving medical preparation projected less anxiety, or distress, in their drawings compared to the video control group. In sum, the children who were prepared for the medical visit reported they were less fearful and demonstrated less anxiety in their drawing of a child visiting a doctor's office. Children prepared for their medical visits by a Certified Child Life Specialist may have shown less fear due to a better understanding and comprehension of the medical equipment they encountered. This decreased fear was projected as a lower average score on the children's drawing of a person visiting the doctor. This supports previous research that psychological preparation before medical encounters reduces children's anxiety (Edwinson, Arnbjornsson & Ekman, 1988, Schwartz, Albina & Tedesco, 1983, Visintainer & Wolfer, 1975). In contrast, children in the video control group projected higher fear scores in their drawings than children in the medical preparation group. This could be due to heightened fears and misconceptions throughout their medical encounter, as their fears and concerns were never fully addressed prior to being examined by the doctor. The findings failed to reveal that medical preparation was effective in reducing the children's distress as rated by nurses. In fact, the nurses rated the children in the medical preparation group as moving their legs more than the children in the video control group. It is unclear why the children in the medical preparation group moved their legs more than the children in the video control group when they were being checked by the nurses. These findings need to be replicated so that this finding can be further explored.

The primary purpose of medical preparation used in this study was to help children gain an understanding and control over the unfamiliar medical equipment they would encounter at the

doctor's visit. It was believed that the developmentally appropriate information provided by the Certified Child Life Specialist would give the children an opportunity to learn and understand how the medical equipment they would experience at the pediatrician would be used on them. If the children perceive the medical environment as less threatening, it was expected that they would display less fear and anxiety. Also possible is that the medical preparation strategy helped the children habituate to the potentially stressful medical tools. That children reported less fear after the medical preparation, compared to baseline levels, supports that medical preparation can be an effective tool in reducing children's fears about a primary physicians visit.

The study had a few limitations. First is the sample size was small. While certain trends and statistically significant findings were demonstrated, the smaller sample size might have inhibited the study's ability to have statistically stronger findings. Furthermore, this study was designed specifically for the school age group, ages 5 ½ to 12, and the findings cannot be generalized to other age groups. Each participant visiting their doctor had their own specific reason for their visit, some receiving well check ups, others due to illness or injury. These unique appointments required differing levels of invasiveness perhaps unique challenges for each patient and were not controlled for in the current study.

In spite of the limitations, the results of this investigation lend support for the use of medical preparation provided by a Certified Child Life Specialist before a child visits their primary physician. Children who received the preparation intervention showed decreased levels of fear and anxiety, while children unprepared showed higher levels of anxiety. Indications are that when children are prepared for their medical encounter, their coping abilities increase and

their anxiety is relieved. Child Life Specialist and health professionals alike can help reduce the typical increase in anxiety associated with medical encounters by providing developmentally appropriate preparation. As medical experiences will continue to be anxiety provoking for children, decreasing their anxiety may build a foundation for success with future medical experiences.

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