CHILD LIFE-DIRECTED VERSUS PARENT-DIRECTED DISTRACTION TO REDUCE PAIN AND DISTRESS DURING AN IMMUNIZATION IN PRESCHOOL AGE CHILDREN

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ABSTRACT

This study examined whether there was a difference between a child life-directed distraction versus a parent-directed distraction in the pediatric medical setting with regard to the reduction of pain and anxiety in preschool age patients receiving an immunization. Additionally, this research examined whether during a simple immunization the caregiver's anxiety affected the child's anxiety. The study assessed 36 children who ranged in age from four to five years old. The children were randomly assigned to a child life distraction group (n=12), a parent distraction group (n=12), or a control group (n=12). These children received a routine immunization upon arriving at the doctors' office. This age group was chosen because one of the main stressors of children in this age range is the fear of bodily harm caused by pain. Results from this study supported the theory that the distraction of the pediatric patient by a child life specialist during an immunization resulted in decreased pain and post-procedural distress for the children. Parents in the child life specialist group reported a marginally significant difference showing that they provided the least amount of reassurances, apologies, and criticisms which correlated with a decrease in pain and researcher reported anxiety. Additionally, parent stress was highly correlated with the child's anxiety and pain. The overall pattern of results on all rating scales supports the use for a child life specialist during a routine immunization to help alleviate and reduce preschool age children's pain and anxiety.

LIST OF ABBREVIATIONS AND SYMBOLS

ANOVA	Analysis of Variance
BOS	Behavioral Observation Scale
CC	Control Group
CHEOPS	Children's Hospital Eastern Ontario Pain Scale
CI	Pharmacologic with Intervention Group
CMFS	Child Medical Fear Scale
CO	Pharmacologic-only group
EMLA	Eutectic Mixture of Local Anesthetics: cream with the equal mixture of lidocain and prilocain that is applied to the skin to help numb the area
F	Fisher's *F* Ratio: A ration of two variances
FLACC	Faces, Legs, Activity, Cry, Consolability
IV	Intravenous: giving substances directly into the vein
M	Mean: the sum of a set of measurements divided by the number of measurements in the set
MONOVA	Multivariate Analysis of Variance
n	Variable Quantity
NS	Not Significant
NUM	Numerical Scale
p	Probability Level

PICC	Peripherally Inserted Central Catheter: a form of an intravenous access that can be used for an extended length of time
SD	Standard Deviation
STAI	State Trait Anxiety Inventory
TPS	Thermometer Pain Scale
t-test	Statistical Hypothesis Test
. [a]	No statistics are computed because value is a constant
*	Correlation is significant at the 0.05 level (2-tailed)
**	Correlation is significant at the 0.01 level (2-tailed)
<	Less than
=	Equal to

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INTRODUCTION

Unfortunately, pain is a natural and unavoidable part of childhood. And, while most pain is the result of minor scrapes and bruises, there is a very different kind of pain that is associated with the delivery of healthcare. Healthcare pain not only involves the actual physical discomfort, but it also has fear, anxiety, and distress associated with it, creating both physical and psychological experiences. Injections are reported to be the most prevalent health-related painful experiences in childhood (Sparks, 2001). And, once the young child has experienced the pain and discomfort of medical care, it is increasingly difficult for the child to feel comfortable and safe during future medical procedures. Although we know it can increase distress, pediatric pain is very often inadequately assessed and addressed during the delivery of childhood medical care. Programs by the healthcare profession to help understand, acknowledge, and provide pain management for children are either insufficient or non-existent.

Pain, anxiety, and fear are common problems for children receiving medical care. Immunizations, the emergency room, pre-hospitalization, and hospitalization are all a part of the medical arena in which medical procedures are a common source of pain, distress, and anxiety for children of all ages. Both fear and the developmental age of the patient determine his or her ability to cope and cooperate with medical procedures. As might be expected, younger children are almost always more anxious and distressed than older children. Young children exhibit more anxiety than older children, suggesting the

need for further development of interventions for young children and their families (Kazak, Penati, Brophy, & Himelstein, 1998).

Furthermore, parents may become distressed and anxious when children are frightened and anxious about a medical procedure. The combination of a frightened child and an anxious parent may increase the chance of negative experiences, such as the child or the healthcare provider, often times resulting in the child needing to be physically restrained, a pharmacologic intervention, or the procedure not being completed (Taddio, Halperin, Rieder, & Shah, 2009). Regardless of the medical procedure, reducing children's pain and stress may help children cooperate during the treatment and develop a positive attitude that will benefit both the patient and healthcare provider during future medical experiences. The young patient will have a more positive memory related to the procedure by reducing or alleviating the pain, which will reduce the stress and anxiety. By relieving pain and stress, the healthcare provider faces a less anxious and more cooperative child, resulting in a better medical outcome.

The American Academy of Pediatrics has made recommendations to reduce the fear and pain associated with medical procedures in children by setting standards and guidelines for practice (Kazak et al., 1998). Both the American Academy of Pediatrics and the American Pain Society emphasize that it is the duty of primary care physicians, general pediatricians, pediatric surgeons, and pediatric sub-specialist to recognize and address all types of pain, including acute, chronic, recurring, procedural-related, and pain related to terminal illness (Committee on Psychosocial Aspects of Child and Family Health, 2001). This jointly issued statement emphasizes the responsibility of pediatricians to become leaders and advocates, insuring humane and competent treatment

of pain and suffering in all infants, children, and adolescents (Committee on Psychosocial Aspects of Child and Family Health, 2001).

The use of intervention through distraction before and during a medical procedure is being recognized as an effective means of reducing pain and fear in children. While distracting the patient's attention away from the procedure, coping skills allow for focus on the task at-hand rather than the pain associated with the procedure. Distraction is defined as concentrating on an activity to prevent attention from focusing elsewhere, thereby, increasing the tolerance for pain by putting pain at the periphery of awareness (Sparks, 2001). Tangible, age-appropriate objects such as toys, books, and movies that children enjoy and can relate to can provide visual, auditory, and tactile distractions. Additionally, guided imagery, hypnosis, and breathing techniques can all be powerful additions to psychological distraction in children (Hom & Burg, 2009).

While the use of distraction is emerging in the pediatric medical setting, there has been little research conducted concerning the effects of child life-directed distraction versus that of parent-directed distraction. The specific purpose of this study is to examine whether the use of distraction during an immunization by a trained professional, such as a child life specialist, will result in decreased pain, anticipatory anxiety, and post-procedural anxiety for the child as compared to parent-directed distraction. Additionally, this study will examine whether the caregiver's anxiety affects the child's anxiety during a simple immunization. Furthermore, this research will look at whether parent reassurance, apologies, and criticism affect the child's anxiety and reported pain.

LITERATURE REVIEW

PAIN

Pain has been defined as an unpleasant sensory and emotional experience related to the actual or possible damage of the tissue (Sparks, 2001). The measurement of pain has become such an important factor in healthcare that it has been labeled the "fifth vital sign" (Committee on Psychosocial Aspects of Child and Family Health, 2001). Pain relief is regarded as a "basic human right," and reducing iatrogenic pain in children should be a priority supported by healthcare providers, researchers, and parents. This idea of atraumatic care is being promoted as a concept when performing needle punctures in children. Atraumatic care has been identified as a philosophy for providing healthcare through interventions that eliminate or minimize the psychological and physical pain and distress experienced by children and families. The basis for this principle lies in minimizing separation of child from family, identifying child and family stressors, minimizing or preventing pain, and promoting parent-professional partnerships (Taddio et al., 2009). Since young children are not in control of their healthcare decisions, it then becomes the responsibility of the healthcare community and parents to explore all the possibilities and try their very best to ensure these children that they will receive as painless and stress-free medical care as can be delivered. For this reason, the personal views and beliefs of the healthcare providers concerning the meaning and value of pain during the development of the child and the treatment of this pain should not stand in the

way of recognizing and treating pain in all children (Committee on Psychosocial Aspects of Child and Family Health, 2001). And, although, no healthcare provider or any parents want to cause the young patient any undo pain and suffering, it is realistic to say that there may be times when painless medical care is just not possible even after all avenues have been explored. However, continued research and cooperation within the healthcare community needs to continue to find ways to minimize pain in such areas.

Although the vaccine injection is just a brief encounter, the pain, fear, and anxiety associated with the injection can be significant and have long-lasting effects on the child: fear of needles, fear of medical care, and fear of doctors and healthcare providers. Much of the problem today is the gap between healthcare providers' acknowledgement of procedural pain and their use of any pain control measures during vaccine injections. Even though primary care providers acknowledge the pain associated with injections and believe pain and anxiety control is an achievable goal in the office setting, the many options available for control of pain and anxiety during immunizations are not often used (Brady, Avner, and Khine, 2011). This study further investigated the barriers to the use of pain control measures in the office setting. Although the primary care providers may acknowledge the pain associated with injections, they do not often administer the injections themselves; therefore, they do not directly observe the fearful child and have a disconnection to the procedure. Additionally, parents who bring their children to the physician's office several times a year may become habituated to the level of the child's pain and anxiety and not feel a need to ask for pain control. And lastly, there is no one agent or technique at the present time that completely controls or eliminates pain;

therefore, primary care providers may view it as a waste of time because of the less than perfect results (Brady, Avner, and Khine, 2011).

The pediatric healthcare community is committed ethically and morally to cause no harm to their patients. Untreated pain that is deemed manageable, especially if that pain has long-term, harmful effects, is inconsistent with the "do no harm" doctrine and unethical (Walco, 2008). Bioethicists have even gone so far as to propose prerequisite conditions that will ensure that children's rights are protected: use the least invasive treatment options; minimize negative impact on health; and secure informed consent, as appropriate (Sparks, 2001).

CHILDHOOD IMMUNIZATIONS

Needle sticks are a necessary part of medical procedures and treatment. Of the 12 billion injections given annually, approximately 5% of those injections are childhood vaccinations. Routine childhood immunizations are the most frequent and painful medical procedure for young children (Taddio, Halperin, Rieder, & Shah, 2009). According to the Center for Disease Control, their immunization schedule recommends that young children ages birth to six years should receive as many as 31 vaccinations to prevent 11 diseases before entering kindergarten (Department of Health and Human Services, 2010). An additional 9 immunizations are recommended for children and adolescents ages 7 to 18, if the recommended childhood schedule was followed (Department of Health and Human Services, 2010). This immunization schedule also recommends that these young children may receive up to as many as five immunization shots during a single office visit. Fortunately, the availability of combination vaccines has reduced the number of needle sticks by two thirds (Taddio et al., 2009). In the future,

however, an even greater number of immunizations can be expected with the development of new vaccines to combat new and re-emerging infectious diseases. With the continuous addition of new vaccines to national immunization programs, today's children have been satirically referred to as "targets for pain" and "pin cushions." Although technology is currently looking at ways to avoid injection pain through mucosal and topical delivery routes, needles will remain the primary method for vaccine delivery and the feared "negative symbol" for routine childhood vaccinations for many years into the future (Taddio et al., 2009).

The development of immunizations has been regarded as one of the most significant medical advancements of all time (Taddio et al., 2009). However, immunizations are not only a main source of anxiety and distress for children of every age but also for their parents and the healthcare profession. Insufficient pain management at the time of immunizations exposes young children to unneeded suffering and the possibility of life-long negative consequences – fear of needles and phobias toward medical care. Needle phobia develops in approximately 10% of the population and usually appears after a negative medical experience (Taddio et al., 2009). In the United States, the pain associated with immunizations is directly related to the low immunization rates for youngsters. Twenty-five percent of children are not vaccinated according to the recommended schedule. Parents' concerns about the pain and discomfort associated with immunizations have been identified as the direct cause of non-adherence to the immunization schedule (Taddio et al., 2009). Currently, different pain management strategies are available to reduce immunization pain: physical interventions and injection techniques; psychological interventions; and pharmacologic and combined

interventions. To date, however, the acceptance and utilization of pain-relieving techniques in the clinical arena has been less than perfect (Taddio et al., 2009).

The failure to utilize pain-management strategies within the pediatric healthcare setting has had a long history; however, the medical profession is slowly beginning to realize the long-term consequences of early pain exposure in young children. And, even though various pain-management interventions are available today, these interventions are still not routinely being put to use in clinical practice. Many road blocks to pain management still stand in the way of recognizing and treating pediatric pain: myths that children, especially infants, do not feel pain; lack of assessment for the presence of pain; misunderstanding as to how to conceptualize and quantify a subjective experience; insufficient knowledge of pain treatment; time restraint issues; expense; and fear of negative effects from analgesics (Taddio et al., 2009).

Concerning misconceptions and myths for example, "It will only hurt for a minute." is a common response from the healthcare provider administering the injection. On the contrary, the pain may only last a minute, but the effects of the pain can last a lifetime. Unmanaged and untreated pain can create a memory that changes how children will respond to pain in the future. It can lead to an unhealthy fear of needles, medical procedures, doctors, and nurses. Without question, there needs to be a push to help close the gap between current research findings and clinical practice to help encourage and implement the use of pain management strategies in the pediatric care setting (Taddio et al., 2009).

CHILDHOOD FEARS RELATED TO MEDICAL PROCEDURES

Fear is a very real and normal part of childhood development whether imagined or real – fear of abandonment, fear of the dark, fear of monsters, and fear of pain. While fear can become a positive teaching force for recognizing potential danger and creating a self-protective force, fear can also be an internal alarm system that alerts the individual to danger and helps prepare them for escape (Nicastro & Whetsell, 1999). Children in today's society face ever-increasing stressors as crises such as 9-11, natural disasters (tornados/earthquakes/fires), acts of war and terror, man-made tragedies (school shootings/kidnappings), personal disasters (death of parent/divorce), and internal problems (family conflict/failure in school) create insecurity and a sense of being unable to control one's own destiny (Nicastro & Whetsell, 1999). Fears that are left untreated can result in psychological impairments and have harmful effects on learning, social skills, and self-concept development, while excessive fears create crippling pathological behaviors that include behavioral, depressive, and emotional disorders (Nicastro & Whetsell, 1999).

While the young child's fears change with age, these fears are very real in the minds of these children. Children show a commonality in fears at certain ages, and a 1990 study conducted by Burke showed that fear of medical procedures was one of the five most reported, common fears among children. Additionally, the article acknowledged that in a 1994 study, two very real and common hospital-related fears within school-aged children were receiving a shot and receiving a finger stick (Nicastro & Whetsell, 1999). Needless to say, the question most frequently asked by children upon entering a doctor's office is: "Am I going to get a shot?" (Taddio et al., 2009).

Medical fear is defined as an unpleasant emotional reaction and sense of danger relating to healthcare events (Taddio et al., 2009). Fear of doctors, needles, medical treatment, and pain can keep people from seeking needed medical treatment. Repeated exposure to anxiety-producing medical situations early in life may lead to adult dysfunctional cognitions and avoidant attitudes about health care (Zelikovsky, Rodrique, Gidycz, & Davis, 2000). Often medical phobias are the result of traumatic experiences from childhood that were never addressed or resolved. Fear of needles or blood being drawn are among the most common problems relating to medical phobia. Unacknowledged and untreated childhood fears will carry over into adulthood and develop into greater fears and maladaptive behaviors later in life. Childhood memories and fear of doctors and dentists have lead to generations of older adults who do not seek medical attention in either of these specialties due to their fear of the pain associated with the treatment. This, in turn, increases morbidity and mortality throughout life as a result of consciously avoiding medical treatment (Taddio et al., 2009). Had the pain and fear been addressed and eliminated at a young age through the proper techniques, however, coping skills may have been developed to aid the individual in dealing with these life-long fears of painful medical events occurring in early childhood. Therefore, developing effective early interventions to reduce children's fears and pain during all medical treatment is extremely important and can have immediate and long-term benefits (Zelikovsky et al., 2000).

PHYSICAL AND PSYCHOLOGICAL PAIN IN CHILDREN

Stress, fear, and anxiety can be pronounced in young children who must frequently undergo testing or medical procedures to diagnose and treat a medical problem

(Dresser & Melnyk, 2003). In order to understand pain, it is important to understand what factors are involved in the creation of pain. Pain has both a physical and psychological presence. Pain is a learned perception and is always a subjective experience. Early life experiences help shape each individual's concept of pain and their pain response. Anxiety and fear have both been found to be very important factors in the concept of pain perception. Fear and anxiety combine to help create stress and are universally experienced emotions that create powerful instincts within the human body to protect itself (Dresser & Melnyk, 2003). Fear can be a positive adaptive force if it teaches children to be aware of potential dangers, or it can produce debilitating effects that render the child physically impaired, emotionally distraught, and behaviorally ineffective (Nicastro, & Whetsell, 1999). The psychological pain of both fear and anxiety combined with the physical pain of the actual procedure, may create a memory of that pain that may negatively impact all future medical procedures for that child.

Pain is a combination of sensory, emotional, cognitive, and behavioral elements that are interconnected to environmental, developmental, socio-cultural, and contextual factors. The suffering that arises out of pain is a result of several factors: the person feels out of control; the person feels overwhelmed; inability to identify the pain source; reason for pain is believed to be dire; and the pain is chronic. The whole idea of pain and suffering is far greater than just a simple sensory experience (Committee on Psychosocial Aspects of Child and Family Health, 2001). Early painful experiences may have long lasting negative effects on neuronal development, pain threshold and sensitivity, coping strategies, emotions, and pain perception (Cohen, 2008).

Managing the pain children feel during medical procedures is particularly challenging, but must be a goal of the healthcare profession. Currently, studies continue to be conducted to investigate children's, parents', and healthcare workers' perception of pain in the pediatric patient. In one study, differences on procedural pain ratings were examined between parent and child, parent and nurse, and nurse and child (Schneider, & LoBiondo-Wood, 1992). Using the Oucher scale, a reliable measure for self-reported pain, data were collected from 40 subjects from a triad of children, parents, and nurses. This scale has a vertical numeric rating system of 0 to 100 for children who can count and understand the relationship of numbers. For children who cannot comprehend numbers, the scale has a vertical photographic scale of 0 (no pain) to 5 (greatest pain). Following a routine physical, the children received immunizations. The age of the children ranged from 2 years, 11 months to 6 years, 6 months. Research revealed that the child-parent perception showed little difference, the child-nurse perception showed significant difference, and the parent-nurse perception was of little significance. This study supported previous research that suggested that nurses perceive children's pain differently than the children who are actually experiencing the pain; hence, the pediatric patient's pain may go unacknowledged and untreated by nurses (Schneider, & LoBiondo-Wood, 1992).

Throughout the years, pain in children has been ignored, misunderstood, and misguided while going unreported and untreated. Prior to the beginning of the child life profession, pain management was left to the discretion of the nurses, and children in pain were treated with analgesics. Nurses believed that assessment was always the first step in alleviating pain in the pediatric patient (Jacob & Puntillo, 1999). However, in a study of

25 post-operative patients, only 12 children were administered 24 doses of an analgesic; even though, medication had been prescribed for all 25 patients (Jacob & Puntillo, 1999). Misconceptions and personal beliefs clouded the decision-making abilities of nurses who determine what drug or, if any drug, should be administered for both procedural and diagnosis-related pain. The purpose of this study was to determine if today's nurses still embrace these beliefs and misconceptions or if the push for recent educational efforts has helped to dispel them once and for all. While the study concluded that many nurses still need to learn more about pain assessment in the young patient, it also stressed the importance of communicating pain management strategies with other health team members to facilitate good decision-making regarding interventions to eliminate pain in children (Jacob & Puntillo, 1999). Open communication with every member of the interdisciplinary team as well as the parents or caregivers can result in pain-free treatment through the use of topical medications, interventions, and distraction.

PAIN IN VERY YOUNG CHILDREN

The first step to alleviating pain in young patients is to acknowledge that their pain is real. Until very recently, children who were too young to express their pain and fears were thought to be too young to experience pain. And, outward appearances do not necessarily reflect the child's pain level, as well as, an infant's inability to verbally respond to pain does not negate the presence of painful stimuli (Hom & Burg, 2009). Current research has suggested that even neonates will show a physiologic response to painful stimuli and have been able to distinguish between real and sham heel sticks. In fact, it is now believed that newborn infants may have a greater response to pain from the same sensory input compared to older children due to the immaturity of the pain system.

The infant neurologic system includes larger receptive fields but lacks inhibitory controls for pain; therefore, infants may actually experience more pain than even adults (Taddio et al., 2009).

Very often, young children receive no analgesia before treatment or even after major surgery. Although the use of drugs is not recommended for minor procedures, invasive medical procedures have always warranted the administration of pain-relieving medicines. A bone marrow aspiration, suturing, and fracture reduction are all medical procedures that require the use of medications. However, procedural treatments such as the IV (intravenous access), lumbar puncture, or PICC access (peripherally inserted central catheter) can be managed very well with the use of distraction allowing that young children are not exposed to the use of unnecessary pharmaceuticals. If necessary, topical analgesics and/or position for comfort may also be used. Doellman (2003) explains the importance of preparation and distraction during the placement of a PICC. Although drugs are certainly an option for the procedure, the child life specialist can help reduce the pain, anxiety, and stress of a threatening and frightening procedure through the proper use of preparation and distraction; thereby, eliminating the use of unnecessary drugs (Doellman, 2003). Through the proper and effective use of distraction, the procedure can be performed drug-free and without any lasting memories of pain and anxiety for the patient or parents (Doellman, 2003).

PAIN MEMORY

The belief that children have no memory of pain is a misconception. Not only do children remember the pain, but, often times, they exaggerate the pain. Diagnostic and treatment procedures for children with cancer are invasive and painful and must be

performed repeatedly over long periods of time. During a state of extreme anxiety, patients focus on threatening information. Clinically anxious children will form a bias toward threatening information as well as interpret any ambiguous situation as threatening. The same is true for pain perception. Anxiety can also affect subjective memory and recall, causing children to remember more pain than was actually experienced and remembering pain to be more intense than it was at the time of the actual procedure (Chen et al., 1999). In one study, the aim was to alter the memories of pediatric leukemia patients who had to undergo painful and repeated lumbar punctures (Chen, Zeltzer, Craske, & Katz, 1999). Post-treatment, children in the intervention group, showed reductions in anticipatory physiological and self-report ratings. At follow-up, these effects generalized to reductions in procedural distress, suggesting that a simple memory-based intervention is effective at reducing children's distress and is maintained over one week without continued intervention (Chen, Zeltzer, Craske, & Katz, 1999).

Another study conducted to investigate memory as it relates to painful lumbar procedures showed that a psychological intervention to alter children's memories of previous lumbar puncture procedures had an immediate effect in reducing heart rate and cortisol levels during anticipatory distress (Chen et al., 1999). However, the study was not conclusive as to whether memory changes actually resulted from the therapy. Furthermore, the study noted that memory intervention is more time intensive than many distracting techniques (pinwheel, bubbles, party blower) that are effective in reducing pain at the time of the actual procedure as well as erasing memory of the painful procedure (Chen et al., 1999).

ALTERNATIVE PAIN REDUCING METHODS

In a study conducted on pain related to lumbar punctures alternative methods were examined for reducing distress, anxiety, and pain in children experiencing painful procedures (Broome, Rehwaldt, & Fogg, 1998). Today, many facilities practice the use of conscious sedation for children undergoing painful procedures. The use of conscious sedation is helpful in reducing behavioral distress and memory; however, it does not help children cope with or master the pain associated with the actual painful procedure. Additionally, it is not effective for pre-procedure, anticipatory anxiety, and fear which may appear several days before the actual procedure. The study measured the relationship of temperament and children's responses to painful procedures following an intervention of relaxation, distraction, and imagery. Over a five-month period the study concluded that these simple techniques were significantly related to a decrease in the children's reports of pain intensity (Broome et al., 1998).

PAIN REPORTING MEASURES

Assessing the patient's pain level is the first, and most important, step to recognizing and treating pain. All healthcare providers should be familiar and comfortable with the basic procedures and tools of pain assessment. This assessment should begin immediately upon admission to the medical facility and continue throughout discharge (Zempsky et al., 2004). Correct pain assessment is critical for proper and comprehensive pain management. Assessing pain in infants and children can be a challenge because of a child's perception of pain and the wide range of developmental and cognitive levels of every child (Liebelt, 2000). Also, there is no perfect rating system for each child because every child is different and pain is very personal.

Today, there are numerous measures and scales for assessing pain, fear, and anxiety in children. When assessing a child's pain, the instrument of measure must take into consideration the child's age, level of cognition, type of pain, and the situation under which the pain is occurring. Additionally, there is no single measure that is useful and reliable for all children and with every type of pain: acute, chronic, and recurrent. Just as every patient is unique, pain is also individual. With all of the assessment tools that are available to the medical profession today, however, it is possible to have a practical, valid, and reliable measure to evaluate children's pain in any particular setting. The most effective means of pain measurement, however, is the self-report method. Children as young as three years of age have been shown to be reliable in self-reporting pain intensity with the use of age-appropriate assessment tools (Bulloch & Tenenbein, 2002). When self-report of pain is not an option, the health care arena has many tested and reliable instruments of measure to rely upon to assess pain in the pediatric patient.

MEASURES: FACES

Since pain is a very personal and subjective experience, self-report appears to be the best method. A patient's self-report is the single best indication of pain, thus patients' needs must be addressed through appropriate pain assessment tools that include self-report (Pasero, 1997). Most self-measurement scale for pain requires the individual to rate his or her pain on a scale of 1 to 10. This is most often used on children of school age and older and allows for a personal input on pain and tolerance. A visual-measurement scale like the Wong-Baker FACES Pain Rating scale is best used on younger children who cannot comprehend the number-rating system. The scale is composed of carious facial expressions ranging from happy to sad/crying. In a study of

preschoolers, the children reported the same pain scores after the instructions were given which did not contain any references to affect as was the case with the original instructions (Pasero, 1997). Although there was some concern as to whether the scale might be measuring fear as well, another 1995 study by Patricia Stein found that preschoolers' ratings for anxiety after receiving injections were not related in any way to their pain scores (as cited in Pasero, 1997).

MEASURES: FLACC

The FLACC tool is a behavioral scale for scoring pain in young children and relies upon the observation and expertise of the care provider. The FLACC pain scale was designed for children between the ages of 2 and 7. Because assessing pain in young children who lack verbal and cognitive skills necessary to express their pain and discomfort can be difficult, if not impossible, the FLACC Pain Assessment Tool is effective in assessing and managing pain in this age group. Use of this scale depends on the observation and skills of the healthcare provider. Incorrect assessment of the patient's pain leads to ineffective pain management for the patient.

DISTRACTION

The latest trend to psychologically sedating the pediatric patient is a non-pharmacological approach known as distraction, which is a class of cognitive coping strategies that divert attention away from a noxious or unpleasant stimulus (Kleiber & Harper, 1999). Distraction enables the person suffering pain to focus their attention on something other than their pain. While these techniques will not eliminate pain entirely, they are believed to help the patient experience considerably less pain. The techniques are meant to distract the child sufficiently throughout the procedure to divert attention

away from the painful stimuli and redirect attention to a pleasant activity (Lininger, 2003). Distraction is a mental coping strategy that channels attention away from a painful stimulus by passively redirecting attention to an activity or actively involving the subject in a distracting task (Murphy, 2009). The distraction uses up the patient's attention capacity which leaves little attention to perceive pain (Murphy, 2009). The brain is believed to have limited ability to focus attention on stimuli. When attention-devoted resources are focused on a source of distraction, there is little attention left to focus on painful stimuli (Cohen, 2008).

Distraction allows the patient to be entertained and amused. As a primary intervention, it provides a simple and effective approach to reducing fear and anxiety. Distraction as an instrument of pain-management includes many and varied interventions. Distraction seems to make sense when working with children in the healthcare setting because they are very easily distracted, especially the younger ones (Davis, 2008). Since children are easily distracted then, it is reasonable to believe that simple distraction will be an effective technique to divert their attention away from a painful and scary procedure. It must always be remembered, however, that just because young children can be temporarily distracted from the pain does not imply that they do not experience that pain or that the pain does not return once the distraction has been removed (Davis, 2008).

EFFECTIVENESS OF DISTRACTION

Effectiveness of distraction depends on the patient, person delivering the distraction, and the distraction tool. It can be used by every member of the pediatric patient's healthcare team, including the parents and the patients themselves. And, by giving the patient his or her choice of distractions, the most effective distraction will most

likely be chosen. While some distraction techniques require training, others can be easily performed by the doctor, nurse, or parents: guided imagery, telling a story, reading a book, watching a favorite movie, or blowing bubbles. Getting the parents involved by having them read a book, staying during the procedure, or participating in the distraction of the child may help to some degree toward reducing anxiety and fear. However, studies have shown that in some cases parent participation can have a reverse effect, causing the child to experience fear and pain. Children can pick up on negative facial expressions, vocal tones, and verbal content. The child's distress level during a painful medical procedure will be strongly influenced by the adult's negative behavior. Additionally, adults who offer up reassurances ("it won't hurt", "you'll be okay") are more likely to cause distress; whereas, distraction is associated with increased child coping (McMurtry et al., 2009). A trained professional, such as a child life specialist, may provide an effective method of distraction to achieve the best results for the present medical procedure. Distractions that have shown promising results as a pain management intervention include: singing, storytelling/books, game playing, reading, favorite toys, blowing bubbles, and watching a favorite video. Pre-procedural distraction coupled with distraction during a painful procedure has been shown to lessen both reported and observed pain levels (Davis, 2008).

DISTRACTION TECHNIQUES

Distraction techniques vary with the age, temperament, and interests of the child, and their effectiveness is supported in today's literature (Schechter et al., 2006). For example, 80 children, ages three to six years of age and who were receiving routine immunizations were distracted with either a party blower or a pinwheel during the

procedure. Children who were introduced to the party blower were significantly less upset, while no significant difference was found in the pinwheel and control group. However, the nurses in the study believed that the party blower and pinwheel had similar ratings in all four categories: upset, pain, cry, and hold (Bowen & Dammeyer, 1999).

In a study review of children receiving routine immunizations, Chambers, Taddio, Uman, and McMurtry (2009) searched databases for controlled trials to determine the effect of psychological interventions on pain and anxiety on children during immunizations. The study review of 1,380 children, birth to 18 years of age, supported the theory of psychological interventions for reducing pain and anxiety in children receiving immunizations. Of the seven categories tested, evidence suggested that simple psychological strategies, such as breathing exercises, child-directed distractions, nurse-led distractions, and combined cognitive-behavioral interventions, reduced immunization pain and anxiety in children significantly (Chambers et al., 2009).

Another study compared the effects of two types of distraction on the perception of injection pain on 105 (53 girls and 52 boys) 4 to 6 year olds who were receiving DPT immunizations. Data was collected from a school-based clinic, public health center, and a walk-in immunization program. Children were randomly selected to receive touch, bubble blowing, or standard care at the time of the immunizations. Because immunization pain is two-fold, the pain of the needle insertion into the skin and the pain of the solution dispersed into the tissue, the distraction technique had to be effective on both aspects of the pain. Pre-immunization fear was measured with the Child Medical Fear Scale (CMFS), and scores indicated that there were no significant differences between age, gender, or treatment group. Data was collected over an 18 month period,

and pain scores were measured with the Oucher scale. Results showed that both touch and bubble blowing significantly reduced pain perception. Fear was an important covariate; however, distraction remained effectual even when fear was not held constant (Sparks, 2001).

Distraction is an easy, inexpensive, and practical psychological pain-management strategy (Dahlquist, Busby, Slifer, Tucker, Eischen, Hilley, & Sulc, 2002). Additionally, it shows the potential to remain effective after repeated invasive procedures (Dahlquist et al., 2002). Data from this study supported the use of distraction as effective for children who undergo repeated needle sticks. Five out of six children experienced significant decreases in overt distress, while nurses rated four of the six participants as more cooperative during the procedure. Parents believed some of the children to be less anxious prior to the procedure, and benefits of the procedure continued over the nine-week period of treatment.

More than 18 million peripheral venous access procedures (IV), which include blood draws and IV insertions, are performed on hospitalized children each year in the United States (Anesiva, 2008). Additionally, it takes upon average of four needle sticks to achieve a successful insertion in the pediatric patient (Lininger, 2003). Healthcare providers and parents often view these two procedures as quick, routine and relatively painless (Zempsky, 2008). Consequently, this attitude of the parents and clinical staff leaves the pediatric patient vulnerable for pain and suffering. While venipuncture procedures are an integral and necessary part of today's clinical practice, these procedures are also the causes of the two most common sources of pain and distress for hospitalized children. Pediatric inpatients report that IV line placement is the leading

cause of procedural-related pain and is equivalent to post-surgical and disease-related pain (Zempsky, 2008).

Venipuncture is one of the most feared medical procedures for young children who are seen at the hospital. Since painful venipuncture is a common healthcare procedure in the Emergency Department each year, behavioral interventions should be used to help the young patient cope with fear and pain. In a study to determine the effectiveness of parental positioning and distraction on pain, fear, and distress of children receiving venipuncture, an experimental-comparison group design was used to evaluate 43 children ages 4 to 11 (Cavender, Goff, Hollon, & Guzzetta, 2004). In this study, pain and fear were self-reported, while parents and nurses also rated the children's pain and fear, and the child life specialist rated the children's distress (Cavender et al., 2004). Although additional research is warranted, findings suggest that parental positioning and distraction used as an intervention procedure during venipuncture has the possibility to increase positive clinical results with the primary benefit being decreased fear (Cavender et al., 2004).

In another study, the effects were compared of two venipuncture stress-management distractions that differed by the degree in which they required children's interaction. Since distraction has been identified as the front-runner in distress-management interventions for preschool-age and younger children, several non-pharmacological treatment protocols were studied. The effectiveness of distraction relies on its ability to use up cognitive capacity; therefore, fewer resources remain to devote to pain. Using both a passive movie and an interactive toy to promote participation in distraction, this study included 81 children between the ages of 1 and 7.

Results indicated that distraction produced significantly better results than the control group with the movie being more effective, especially in the older children. This finding suggests that sufficiently engaging and easy-to-use distractions might be a cost-effective and time-efficient pediatric distress management technique (MacLaren & Cohen, 2005).

In 1994, there were very few studies on non-pharmacologic interventions for pain-management. Recognizing this inadequacy, Vessey et al. (1994) conducted a study using a kaleidoscope as a distraction technique. Findings confirmed that children did, in fact, experience less pain using this technique. This study became the turning point for pain management in children (Murphy, 2009). Since that time, additional research has been conducted comparing pharmacologic and non-pharmacologic solutions for reducing pain and anxiety in the pediatric patient during procedures involving needle sticks. One study consisting of 162 leukemia patients was conducted to determine if drugs were more effective than drugs combined with an intervention. Participants were divided into a pharmacologic-only group (CO), a pharmacologic with intervention group (CI), and a control group (CC). Data from this study did conclude that mothers of children with leukemia detected lower levels of distress in the children in the CI group (distraction aided by pharmacologic help). This finding was also supported by the nurses involved in the study. Parents also reported improvements in parenting stress when the child was less stressed (Kazak et al., 1998).

To further support the theory that distraction aids in the reduction of pain and anxiety, Fanurik, Koh, and Schmitz put (2000) forth in their study that children receiving the topical anesthetic, EMLA, in combination with distraction techniques displayed less behavioral distress before, during and after IV insertion than those patients who had only

EMLA. The study also determined that distraction techniques were most effective with the youngest children. Additionally, this study focused on the anticipatory, procedural, and recovery phases of the treatment. Interventions that are carried out strictly at the time of the procedure are not as effective in helping to minimize distress and enhance coping for future procedures as those interventions that are performed throughout all phases of the procedure (Fanurik et al., 2000).

Survival rates of children with cancer have increased, as has the increase in awareness of the extent of pain and anxiety associated with treatment and the needs of families in dealing with the child's pain and anxiety (McCarthy, Cool, & Hanrahan, 1998). In response to this, a pilot program introduced at a university examined cognitive behavioral interventions implemented for painful pediatric procedures. The goal of the program was to train parents in the distraction techniques, assess the effectiveness of the techniques, and assess the acceptability of the program with hospital staff and parents. Although the study had to be stopped early, the researchers believe that the program was successful. Parents who had been trained in distraction and controlled breathing to assist their children were enthusiastic about the program when they saw the positive effects. Additionally, the enthusiasm of the staff members suggested that the hospital staff may finally be ready to embrace the use of cognitive behavioral interventions into their routine practice to prevent pediatric cancer patients from having to experience painful medical treatments (McCarthy et al., 1998).

CHILD LIFE ADVOCATES

In at least one study, child life specialists were ranked the highest within the health care team as most important for patients' psychosocial well-being (Cole, Diener,

Wright, & Gaynard, 2001). This is extremely important because the medical arena presents sick children and their families with many and varied stressors. For this reason, the child life profession was created to focus on the psychosocial care and well-being of hospitalized children and their families by preparing young patients for health care procedures, providing emotional support, facilitating therapeutic play, and using knowledge of child and family development to enhance children's experience in the health care setting. With the steady growth of the child life profession, health care systems are increasingly recognizing the importance of the profession for the psychosocial health of their young patients (Cole et al., 2001).

The unfamiliar hospital setting can be intimidating and unsettling for the young patient. Psychologically, children are unprepared for the separation from their family, unfamiliar routines, and painful procedures, not to mention, the sights, smells, tastes and sounds of their surroundings. The pain associated with needle sticks is a source of anxiety and distress for the children undergoing the procedure, their parents, and the healthcare providers who administer them. Younger children are most in need of intervention because they self-report more pain and display more behavioral distress during medical procedures (Kleiber & Harper, 1999). It was not reported, however, whether younger children perceive more pain or if they have fewer coping skills at a younger age. Additionally, research has shown that distress behavior during a painful medical procedure is influenced by a child's innate temperament (Kleiber & Harper, 1999). One only has to observe a child receiving an injection to validate that children fear shots and perceive them as extremely painful. Children, nurses, and parents consistently reported that children do indeed fear "the shot" (Bowen, & Dammeyer,

1999). Considering the routine use of needles in medical treatment today, it only makes sense that the medical field discovers an inexpensive, practical, and effective way to ease children's pain and distress during medical treatment. Non-pharmacologic stress management and emotional support is essential to providing a comfortable and pain-free environment for the child during needle sticks.

Child life specialists in the Emergency Department setting have the ability to decrease anxiety and pain perception, teach the child and staff simple distraction techniques, and support family involvement in the child's care. The child life specialist has an important role in the pediatric medical setting. Because he or she is one of only a few medical professionals in the emergency setting who is not in a position to cause emotional or physical pain to the child; rather, the child life specialist is there to advocate for the well-being of the child and family (Zempsky & Cravero, 2004). Therefore, it is important that the child life profession not only educate, support and advocate for the children and families of these young children, but continue to educate the health care arena on their commitment to family-centered care.

PARENTAL DISTRACTION, COACHING, AND REASSURANCE

According to Kleiber and Harper (1999), one of the most frequently used non-pharmacological interventions for acute pain management in the pediatric patient is to draw the patient's attention away from the medical procedure through distraction. However, they also stress the difficulty in showing the usefulness of distraction to decrease children's distress behavior and pain during medical procedures because of the small number of studies and the fact that many of these studies use very small samples and report inconsistent findings (Kleiber & Harper, 1999). Bowen and Dammeyer (1999)

believe that not only does distraction of the child during the procedure provide added reduction in anxiety and subsequent pain, but that distraction prior to the start of the procedure is also beneficial. It is further believed that during the procedure, the behavior of the parents or caregiver clearly affects the child's behavior, albeit good or bad (Bowen & Dammeyer, 1999).

Whereas distraction techniques help to significantly decrease distress in the pediatric patient during needle procedures, learning how to distract is extremely important. Parental behavior can affect the child both negatively and positively. Schechter et al. (2007) clarify the term "parent" as most often meaning mother rather than father. Fifty-three percent of the variance in childhood distress during a routine immunization was a direct result of maternal behavior. Behaviors that were associated with increases in child coping included humor, commands to use coping strategies, and non-procedural talk. Excessive parental attention, empathy, reassurances, criticism, apologies and giving control to the child all seem to increase distress with reassurances being the most common adult vocalization used during immunizations. Therefore, teaching parents techniques to promote coping should benefit both the parents by giving them roles that reduce their sense of helplessness and should also benefit the child by reducing distress and in increasing his mastery (Schechter et al., 2007).

Manimala, Blout, and Cohen (2000) present a study that compared the effects of parental distraction versus parental reassurance on children's coping and distress during routine immunizations. Eighty-two parent-child dyads were randomly assigned to three different groups: attention control, distraction, or reassurance. The children ranged in

age from 3.8 to 5.9 years old and were all receiving pre-school immunizations at a county health department. The results supported the hypotheses that reassurance produces increases in the child's distress. Children in the reassurance group reacted with greater verbal fear than the children in the control group and distraction group. In addition, three times as many children in the reassurance group needed to be restrained as compared to the distraction group (Manimala et al., 2000). Additionally, parents in the reassurance group were more upset following the immunizations than the parents in the other two groups, supporting the counter-therapeutic effect of reassurance on children's reactions during this acute, but painful, pediatric procedure (Manimala et al., 2000).

Adult behavior during medical procedures can play an important role in the development of children's pain memories (Noel, McCurtry, Chambers, & McGrath. 2009). This study included 24 males and 24 females between the ages of 5 to 10 years old who were receiving a venepuncture. The study examined the relationship between children's pain, anxiety, adult behaviors, and the children's memories of the venepunctures. Children self-reported pain intensity and anxiety immediately following the procedure and at a two week follow-up. Additionally, contextual questions were asked at the two-week follow-up. As with previous research, several adult behaviors during the procedure were negatively related to the children's distress, coping, pain intensity, and anxiety. On the other hand, the staff's coping-promoting behaviors were related to the children's memories of the medical procedure allowing them to recall more contextual details of the medical procedure. The findings showed that children's initial experience of pain intensity during the venepuncture related to their memories of the procedure. At follow-up, children who reported high levels of pain intensity immediately

following the procedure tended to over-estimate their prior level of anxiety over time, while the opposite was true of children who reported low levels of pain, thus, showing that negative parental behaviors do affect subsequent pain memories in children (Noel et al., 2009).

Mahoney, Ayers, and Seddon (2010) examined the association between parent's and healthcare professional's behaviors and children's distress and coping abilities during a venipuncture. The study's results demonstrated a need for continued research into pediatric needle procedures to increase understanding and knowledge and find appropriate methods to reduce needle-related stress. This study utilized 22 males and 28 females, ages 7 to 17 years, along with 43 parents and 7 guardians. In contrast to other studies, the child's age was not significantly associated with distress behaviors which could have been due to the fact that healthcare professionals used less coping-promoting behavior with the older children. Consistent with other studies, this study also found that parent distress-promoting behavior is more significantly associated with child distress than the behaviors of the healthcare professionals. Parents' distress-promoting behaviors consisted mostly of giving reassurance as opposed to apologizing, empathizing, or giving control to their child. Additionally, this study gives credence to the idea that the healthcare professionals are in a more empowered position than the parents, allowing for more influence on the children's coping behavior (Mahoney et al., 2010).

To further demonstrate that a child's distress to a painful medical procedure is strongly influenced by adult behavior, McMurtry, Chambers, McGrath, and Asp (2010) presented a study that examined children's perceptions of adult emotions during reassurance and distraction. One hundred children ages 5 to 10 and their parents

participated. In the first part of the study, spontaneous parent to child interactions during a venepuncture were recorded and used for a recall task; whereby, the children viewed parental reassurance and distraction and then rated their parents' fear and happiness. Secondly, the children were asked to rate the intensity of parental fear and happiness in twelve video vignettes that used an actor posing as a parent during a venepuncture. The vignettes were made to manipulate facial expression (happy versus fearful), vocal tone (rising versus falling), and content (informative reassurance versus uninformative reassurance versus distraction). For both tasks, the children gave higher ratings of fear during reassurance than distraction. Regarding the vignettes, the children gave higher ratings for parental fear for a fearful facial expression; however, vocal tone differed with vocal content. Not only do the results give insight into the complexity of adult reassurance, but they also draw attention to the important role of parental facial expression, tone, and verbal content during painful pediatric medical procedures (McCurtry et al., 2010).

Although it is not totally clear why parental reassurance is associated with increased distress in children during stressful medical procedures, a possible answer could be that reassurance may act as a signal of parental anxiety and fear to the child. In the study by Chambers, Taddio, Uman and McMurtry (2009), they believed that parents in these types of studies had difficulty appropriately implementing the distraction and other procedures because the parents were feeling anxious about the procedure and/or they were they were unable to withhold their more instinctive responses. A child may analyze the reassurance given by the parent and then detect fear, anxiety, or stress from the parent which may be communicated through facial expression, vocal tone, or verbal

content (Mahoney et al., 2010). Chambers, Taddio, Uman, and McMurtry (2009) reported that there was insufficient evidence at this time to support parent-led distraction or parent coaching since these interventions were only effective in reducing observer-rated distress and no differences in other measures of pain or distress. In the study conducted by Manimala, Blout, and Cohen (2000), they concluded that their findings were consistent with previous correlational research which indicated that parental reassurance could have a harmful effect on children's distress.

Current research, albeit small, supports the use of distraction in the pediatric setting. This same research also suggests that a trained professional or child life specialists is more likely to achieve a better result with the pediatric patient during the administration of distraction. It has been shown that using distraction with children during medical procedures will, indeed, reduce the amount of observed distress behavior for most children. Since pain is personal, the amount of benefit will vary from child to child. Distraction is a low-cost intervention that has a measurable benefit with no risk to the patient (Kleiber & Harper, 1999). Distraction with age-appropriate distraction tools has the advantage of being the only psychological intervention that can be used effectively for children of any age from infants to adolescents (Chambers et al., 2009).

A NEW APPROACH

As attitudes and the knowledge for minimizing procedural pain in children begin to change, medical facilities strive to comply with policy statements and clinical guidelines. The American Academy of Pediatrics along with the American Pain Society (2001) are now recommending that even minor procedures such as IV access and PICC insertion be administered with minimal pain and anxiety. Leahy, Kennedy, Hesselgrave,

Gurwitch, Barkey, and Millar (2008) review four case studies on venepuncture and present information from the perspective of the nurse, doctor, pharmacist, and child life specialist on multidisciplinary programs to manage needle pain in the pediatric patient, and stress the importance of instilling a pain-free philosophy among the staff and a non-pharmacologic, child life approach to confronting pain and anxiety during routine medical procedures.

Because children will experience so many painful medical treatments in their young lives, the healthcare community must become sensitive to their needs and strive to make treatment as painless as possible. Newborns will experience heel sticks, immunizations, vitamin K injections, and circumcision within their first few days after birth (Blout, Piira, Cohen, & Cheng, 2006). Pre-term infants, low-birth weight babies, and children with chronic illnesses may require additional procedures such as venous or arterial catheters, chest tube placement/removal, tracheal intubation, lumbar punctures and injections. Children who become ill and need hospitalization will face venepunctures (IV's and blood draws), PICC's, ports (small medical device installed beneath the skin where a catheter connects to a vein), broviacs (intravenous catheter which usually reminds in place over an extended period of time), and possibly burn debridement (removing bad tissue while cleansing the area). Additionally, children will experience immunizations and dental treatment (Blout et al., 2006). Children will face the possibility of many needle sticks in their young lives leaving them at risk for pain and suffering. While all of these procedures are designed to contribute to the health and welfare of America's children, they also contribute to their fear, anxiety, distress, and

pain. It is difficult to explain to a child that you are truly trying to help them when they cannot understand why you are hurting them.

Literature, albeit it small, has shown that distraction is effective with infants, toddlers, pre-school, school-age, and adolescents in helping to reduce stress, anxiety, and pain associated with procedural medical care (Murphy, 2009). Distraction is one of the most frequently used non-pharmacologic interventions for relieving pain in children today (Gilboy & Hollywood, 2009). Distraction is a low-cost, easy to use intervention that has no risk to the patient and a measurable benefit (Gilboy & Hollywood, 2009).

FUTURE PAIN MANAGEMENT

Although attitudes on minimizing procedural pain in young children are finally changing, there is still a need for expansion and replication of research if pain management for children is to be forthcoming, timely, and effective. A review of current literature in the area of children's pain and how to manage that pain demonstrates that this is a relatively new area of research with some conflicting results. If research can provide an increased understanding of pediatric pain, treatment of children will improve greatly as pain management education grows and the subject of pediatric pain is brought to the attention of the public (Committee on Psychosocial Aspects of Child and Family Health, 2001). The best long-term common approach to changing the way children are treated in healthcare facilities will come about with the education of physicians, nurses, and healthcare technicians both before and after certification (Southall, Burr, Smith, Bull, Williams, & Nicholson, 2000). With expanded knowledge, interventions for pain can become more specific and widely accepted by parents and the rest of the healthcare profession.

Managing the pain and anxiety of the pediatric patient requires a unified effort, using a variety of distractions. Non-drug interventions start with age-appropriate education at the patient's level of understanding, followed by various methods of distraction. Involving the entire healthcare team will improve the effectiveness of these methods. A planned approach, documentation of interventions and distractions and their effect, and continuity of care between the healthcare team will ensure that the best possible care for each individual has been reached and the goal of effective pain management has been met (Davis, 2008).

CURRENT STUDY

This current study is unique in that there is no research that specifically examines child life-directed distraction versus parent-directed distraction in a pediatrician's office to reduce children's distress during an immunization. This child life study was conducted in a pediatrician's office whereas, most research in this field of study is conducted in a hospital or clinical setting. This may be, and most likely is, due to the fact that child life is not utilized in the pediatricians' offices to the extent that it is used in the hospital setting. Also, there is little research with the use of the *I Spy* book as the only distracter. Child life studies exist using books in general, or the *I Spy* book coupled with other distracters, such as comfort positioning, parent holding the child, and the use of analgesics. The *I Spy* book is inexpensive, readily available, requires little to no instruction, and is easily understood. The book also has a wide-range of appeal in the 4 to 11 year age group. It is oversized so that when opened it blocks the visual field from the procedure. The pictures and colors engage and sustain the child's attention, and the

hidden items challenge the child to search for and find the items. The book is also culturally neutral (Cavender, Goff, Hollon, & Guzzetta, 2004).

All children deserve the benefit of continued research into the management of procedural pain. Currently, there is enough knowledge about pediatric pain to treat children humanely and effectively, with new research continuing to promote the use of procedural interventions as a means of reducing and alleviating the pain and distress associated with pediatric care (Committee on Psychosocial Aspects of Child and Family Health, 2001). And, although data supporting the use of behavioral intervention for pediatric procedural pain is currently available, literature documenting the effectiveness of a specific intervention for a particular patient undergoing a specific procedure can be hard to find. There is sufficient supportive data, however, to provide guidelines that will benefit most children. Currently, behavioral approaches being utilized in pediatric pain management are pre-procedural and interventions that occur at the time of the actual procedure (Cohen, 2008).

Until recently, responsibility for procedural pain management has fallen upon the nurse and parents. That is now changing with the expansion and acceptance of the child life profession that is trained to specifically handle the fears, anxieties, distress, and pain of the pediatric patient. All healthcare professionals are encouraged to advocate for and facilitate the use of services offered through child life programs that can have a dramatic effect in improving psychological and physical comfort in the pediatric patient (Committee on Psychosocial Aspects of Child and Family Health, 2001).

It is the absolute duty of all healthcare professionals to provide compassionate care to all children. While there are still medical procedures that require analgesics to control

pain, non-pharmacological approaches to calming and sedating children are gaining in popularity and acceptance. Spending just a few minutes distracting the fearful child from a medical procedure is always in the child's, parents, and healthcare provider's best interest. Eliminating pain and anxiety associated with pediatric medical procedures will go a long way to help ensure patient cooperation and a positive procedural outcome as well as a more positive attitude for future medical treatment.

Due to a gap in the current literature, it is not known whether child life-directed distraction is more effective than parent-directed distraction for preschool-age children receiving immunizations in the pediatrician's office. Additionally, further research is needed to determine if parent reassurance, apologies, and criticism affect the young patient's anxiety and reported pain. In the current study, preschool age children visiting their pediatrician for an immunization were randomly assigned to a distraction group led by a child life specialist or a parent, or they were assigned to a control group. This study examined the following hypotheses:

1. Children in the child life-directed distraction group will display less pain than those children in the parent-directed distraction and control groups as measured on the FLACC, CHEOPS, and thermometer pain scale.
2. The children in the control group will display the greatest amount of pain as measured on the FLACC, CHEOPS, and thermometer pain scale.
3. Children in the child life-directed distraction group will display less anxiety than those children in the parent-directed distraction and control groups as measured on the BOS and FACES.

4. The children in the control group will report the greatest increase in anxiety as measured on the BOS and FACES.
5. Greater parental reassurance, criticism, or apologies will correlate with children's pain on the FLACC, CHEOPS, and thermometer pain scale.
6. Greater parental reassurance, criticism, or apologies will correlate with children's anxiety on the BOS and FACES.
7. Children's anxiety on the BOS and FACES will correlate with parent's STAI anxiety scores.
8. Children's pain rating on the FLACC, CHEOPS, and thermometer pain scale, will correlate with parent's STAI anxiety scores.

METHODS

STUDY OVERVIEW

This current study included 36 typically developing children who were recruited from Tuscaloosa Pediatrics and West Alabama Family Practice and Sports Medicine. The participants were recruited from four different doctors, including one general practioner and three pediatricians. The children ranged in age from four to five years old and were visiting their doctor to receive an immunization. The children were scheduled to receive between three to five different immunizations. Parents were consented and asked to complete a demographic questionnaire and an anxiety scale (STAI) before and after their child's immunization. Children were assented and asked to point to a face on the scale (FACES) that described how they were feeling before and again after their immunization. Next, a researcher completed the Behavioral Observation Scale (BOS) while observing the child to determine his/her pre-procedural anxiety. While the immunization procedure was being performed, the researcher completed the FLACC scale and the nurse completed the CHEOPS scale to assess the child's observed pain. Finally, when the immunization was over, the children were asked to point to a specific spot on the thermometer pain scale (TPS) that described how much pain they felt during the immunization.

GROUP ASSIGNMENT

The children were randomly assigned to one of three groups, the child life-directed distraction group (n=12), the parent-directed distraction group (n=12), or the control group (n=12). During the immunization, the communication of the parent directed at the child was audio recorded. These were later coded for parent reassurance, apologies, criticism, and empathy. The distraction groups used an *I Spy* book to help draw the child's attention away from the immunization.

MEASURES

Parent Assessment

The parents were asked to complete two forms at the beginning of the study. The first form was a demographic/background questionnaire, which is a 19-item survey. The questionnaire is split into two parts; one part is for information about the child, and the other part is for parent information. The child section inquires about the child's age, sex, race, age at last shot, whether he or she is current on immunizations, serious past medical history, and/or if any physical, verbal, social, and psychological problems exist. The parent information requests age, sex, martial status, education, and occupation of both parents, whether they usually accompany their child to the doctor, if the child knows why they are visiting the doctor, if they have other children and their ages, and if they are currently participating in any other studies.

The parents completed the State Trait Anxiety Inventory (parent anxiety scale) next. This is a 20-item questionnaire where they bubble in the answers that refer to how they are feeling at that specific moment. Answers range from 1 point to 4 points: not at all (1 point), somewhat (2 points), moderately so (3 points), and very much so (4 points).

Questions 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20 were reversed, which means any score of 4 would translate to a 1; any score of 3 would translate to a 2; and so on. The possible range of the scores is between 20 and 80. A score of 20 to 36 demonstrates low anxiety, 37 to 45 indicates moderate anxiety, and 46 to 80 exhibits high anxiety. Parents' anxiety on the STAI was assessed before and after the immunization. The STAI was created to provide reliable, moderately brief, self-report scales for determining state and trait anxiety in both research and clinical practice because it is important to distinguish between anxiety as an emotional state and individual differences in anxiety as a personality trait. The STAI has outstanding psychometric properties for high school and college students, working adults and the elderly. Since being introduced 40 years ago, the STAI has been translated and adapted to 70 languages and dialects, and is used extensively in research as evidenced by citations in more than 16,000 archival publications (Speilberger, 2010).

Child Assessment (self-reports)

The child was asked both pre and post immunization to point to a face on the FACES scale that described how he/she was feeling right now. The FACES scale uses six faces of expression ranging from 0 (smiling) to 5 (sad and crying), with 0 indicating no pain and 5 indicating excruciating pain. This numerical-rating system provides for a number rating which is assigned to the patient's pain and then permanently charted in the patient's records (Pasero, 1997). The validity of the FACES scale has been confirmed in several studies – that the scale, can, indeed, measure what it is designed to measure (Pasero, 1997).

Immediately following the immunization, the child was asked to point to the Thermometer Pain Scale (TPS) to indicate how much pain he or she experienced during the immunization. The TPS is a colored scale which ranges from no pain to most pain. The scale is smaller at the bottom and gradually becomes wider as it reaches the top. Also, the colors change from white to dark red, demonstrating more pain moving to the top of the scale. The TPS has a number scale that ranges from 0 to 10 to designate a specific number for where the child points. The higher the number, the greater the reported pain perception.

Nurse Assessment of Child

The nurse's measure included the Children's Hospital Eastern Ontario Pain Scale (CHEOPS), which was completed while the child was receiving the immunization. The CHEOPS scale is a 6- item behavioral scale for young children that is used for evaluating post operative pain and focuses on cry, facial expression, verbal communication, torso, touch, and legs. Additionally, it is beneficial when used to monitor the effectiveness of interventions for reducing pain and discomfort. Each area lists definitions that explain a specific behavior demonstrated by the child. The scoring can range from 0 to 3, with a total score ranging from as low as 4 and as high as 13, with higher scores indicating greater child distress. In a study on pediatric burns, the CHEOPS scale was used to effectively measure the distress behaviors of young burn victims. According to this study, inter-rater reliability between 90% and 99.5% has been reported for the CHEOPS scale when monitoring 1 to 5 years olds following various surgical procedures (Hernandez-Reif, et al., 2001).

Researcher Assessment of Child

The researcher completed the Behavioral Observational Scale (BOS) based on the child's behavior both before and after the immunization. The BOS is a 7-item behavioral scale which ranks state, affect, activity, vocalization, anxiety, cooperation, and fidgeting/nervous behavior as either low, moderate, or high. Low indicates a score of 1, moderate indicates a score of 2, and high indicates a score of 3. Both anxiety and fidgeting/nervous behavior scores are reversed; therefore, low would indicate a score of 3 and high would indicate a score of 1. The BOS ranges from 7 to 21, with higher scores indicating less anxiety. In one study, the BOS was used to measure the symptoms of atopic dermatitis on young children following massage therapy. Since it is unlikely that the positive findings were the result of the placebo effect, the independent behavioral observations of the children and the parents' observations of their children combined to suggest that massage therapy was, indeed, beneficial in relieving symptoms of atopic dermatitis (Schachner, Field, Hernandez-Reif, Duarte, & Krasnegor, 1998).

While the immunization was administered, the researcher completed the FLACC scale based on how the child was reacting to the immunization. The FLACC Pain Assessment Tool (behavioral assessment scale) is based on a mnemonic device, and each of the five categories of pain behavior is scored either a 0, 1, or 2 and is based upon a response or assessment (Merkel, Voepel-Lewis, Shayevitz, & Malviya, 1997). FLACC stands for and assesses (f)acial expressions, (l)eg movement, (a)ctivity, (c)ry, and (c)onsolability. A study on the FLACC scale to determine its reliability and validity concluded that FLACC provides a simple framework to quantify behavioral observation for research as well as for clinical purposes. The study further showed a high degree of

correlation between the two observers' FLACC scores, illustrating a good inter-rater reliability. This scale is invaluable for measuring infants, very young children, and children who have trouble communicating verbally (Merkel et al., 1997), with the scores ranging from 0 to 10. Higher scores indicate greater procedural pain.

RESULTS

DEMOGRAPHICS

The results of ANOVAs and chi-square tests revealed no differences between groups on the demographic data (see Table 1).

Table 1

Demographic Data and Background Questions (standard deviations in parentheses)

Variables	Child Life	Parent	Control	F	X^2	*p*
Children						
Age (in months)	56.25(5.83)	55.00(6.12)	53.00(5.56)	.95		NS
Gender					.71	NS
Male	6	4	5			
Female	6	8	7			
Race					.53	NS
Caucasians	12	11	10			
African-Americans	0	1	1			
Other	0	0	1			
Age of last shot(years)	3.00(.43)	2.95(.69)	3.00(.54)	.12		NS
Child current on immunizations					.59	NS
Yes	11	12	11			
No	1	0	1			
Past medical experiences					1.00	NS
Yes	11	11	11			
No	1	1	1			
Physical, verbal, social, or psychological problems					.36	NS
Yes	0	1	0			
No	12	11	12			

Parent gender					.59	NS
Male	0	1	1			
Female	12	11	11			
Parent age	35.25(3.49)	35.25(3.91)	34.33(3.63)	.25		NS
Martial status					.59	NS
Married	11	12	11			
Divorced	1	0	1			
Socioeconomic status					.47	NS
Class 1	1	0	1			
Class 2	11	10	9			
Class 3	0	1	2			
Class 4	0	0	0			
Class 5	0	1	0			
Do you usually accompany child to doctors visit					.59	NS
Yes	12	11	11			
No	0	1	1			
Does child know why they are at the doctors					.49	NS
Yes	9	9	11			
No	3	3	1			
How many other children do you have?	1.42(.90)	1.25(.75)	1.17(1.03)	.24		NS
Participating in other studies?					.[a]	NS
Yes	0	0	0			
No	12	12	12			

Note:
NS=not significant
.[a] shows that no statistics are computed because value is a constant

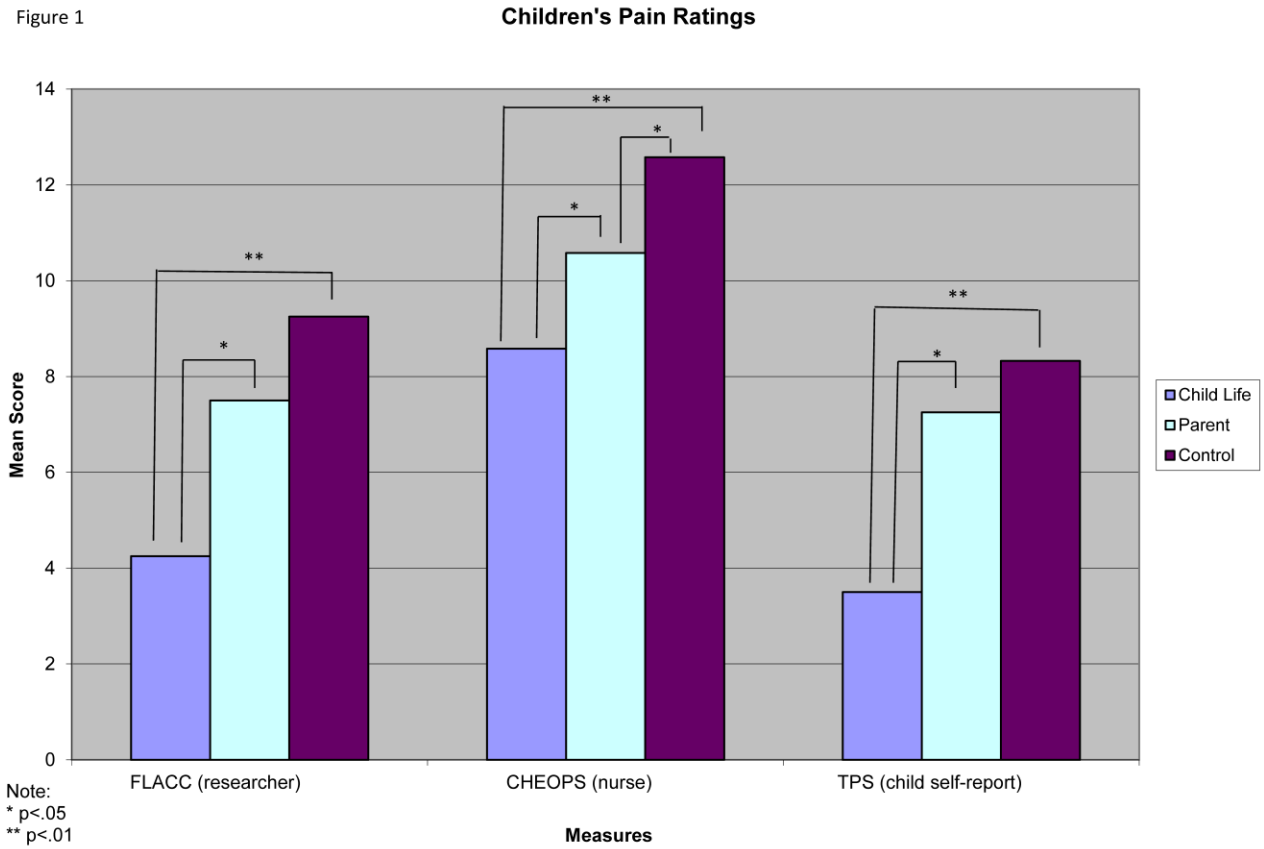
CHILD'S PAIN

Figure 1 illustrates the results of the children's observed and reported pain measures. Ratings of researcher observed pain (FLACC) during the immunization for the child life-directed distraction group showed a significant difference from the other groups, $F(2,35)=12.651$, $p<.05$. The parent-directed and the control group did not differ significantly from each other on the FLACC (See Figure 1).

In addition, ratings on the nurse assessment of the children's observed pain during the immunization (CHEOPS) differed significantly among the three groups, $F(2,35)=12.115$, $p<.05$. Planned comparison showed that the children in the child life-directed distraction group scored the lowest (M=8.58, SD=2.7), the parent-directed distraction group scored the second lowest (M=10.58, SD=2.1), while the children in the control group scored the highest (M=12.58, SD=.52). These three means differed from each other (See Figure 1).

Finally, in addition to the observer rating, the children self-reported their pain level. Children assigned to the child life-directed distraction group reported the lowest pain score as measured on the TPS, $F(2,35)=13.27$, $p<.05$. The self-reported pain for the parent and control group differed significantly from the child life group, but not from each other (See Figure 1).

Figure 1



Note:
* p<.05
** p<.01

Because more than one dependent measure was being evaluated for anxiety (BOS and FACES) across two time periods, a repeated measures multivariate analysis of variance (MANOVA) was used to evaluate mean differences among the three groups. The repeated measure was time (pre-and-post), and the between groups variable was group (child life distraction, parent-directed distraction, and control group). The MANOVA revealed a significant time by group interaction effect, $F(6,64)=2.644$, $p<.05$. Subsequent ANOVAs showed a significant pre-to post difference in child anxiety for the BOS, $F(2,33)=6.469$, $p<.05$, and the FACES, $F(2,33)=9.362$, $p<.05$, measures. Paired sample t-tests were then conducted to reveal pre-to-post differences within groups. The child life-directed distraction group showed no significant difference pre-to post on the BOS or FACES measures. In contrast, the results for the BOS showed a significant difference pre-to post in both the parent-directed distraction group, $t(11)=4.8$, $p<.01$, (M=17.50 pre vs. M=13.83 post) and control group, $t(11)=6.67$, $p<.01$, (M=16.83 pre vs. M=13.00 post), with lower means suggesting greater anxiety. Lastly, the ratings for the FACES showed statistically significant differences pre-to post in the parent directed distraction group, $t(11)=5.04$, $p<.01$, (M=.50 pre vs. M=3.33 post), and control group, $t(11)=6.79$, $p<.01$ (M=.50 pre vs. M=3.75 post) with higher scores indicating greater anxiety (See Table 2).

Table 2

Pre and Post Anxiety Test Results (standard deviations in parentheses)

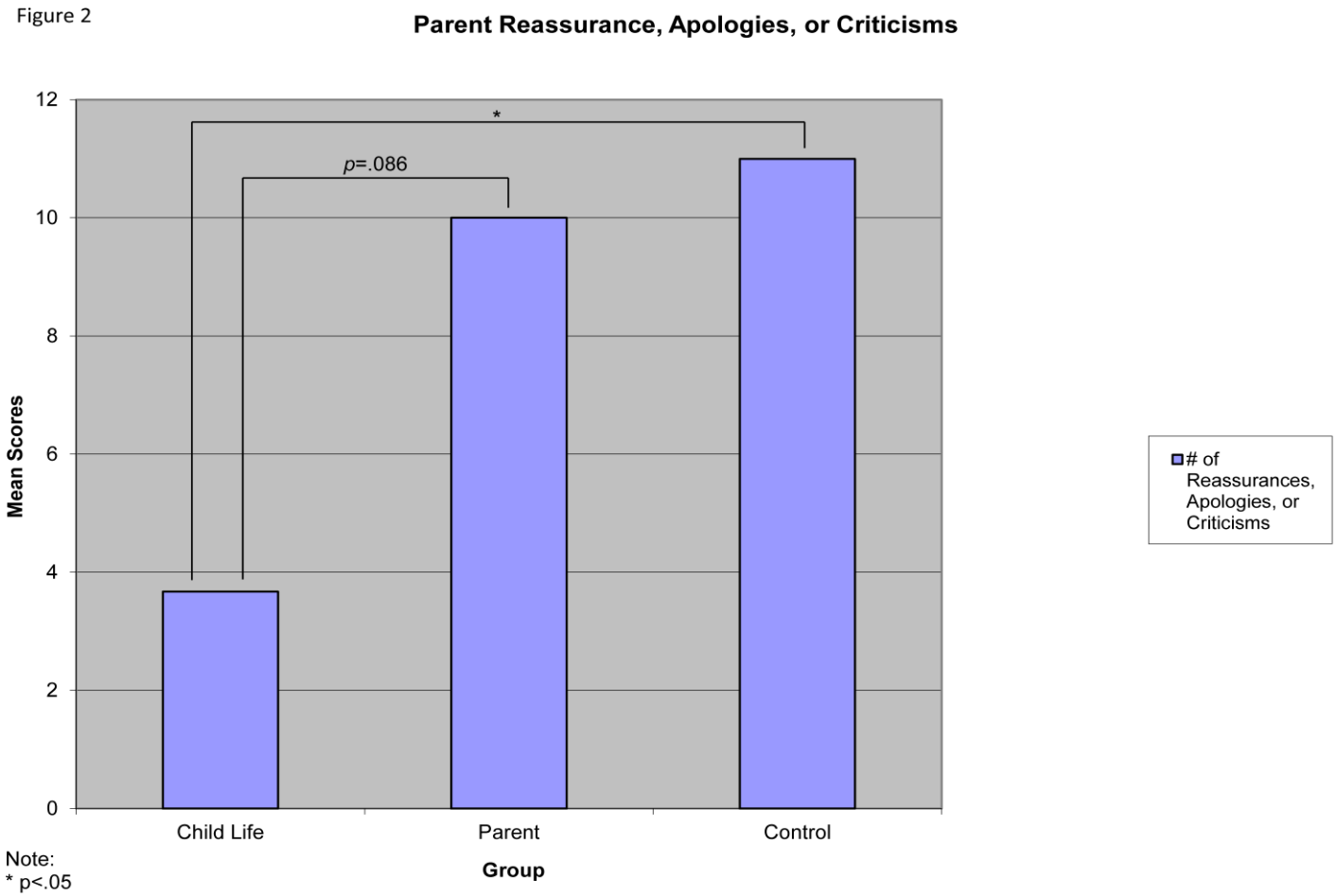
Variables	Child Life		Parent		Control		F	*p*
	Pre	Post	Pre	Post	Pre	Post		
Child anxiety (BOS)							6.47	.004
	17.25(2.1)$_a$	16.42(3.3)$_a$	17.50(1.8)$_a$	13.83(2.0)$_b$	16.83(1.9)$_a$	13.00(1.5)$_b$		
Child anxiety (FACES)							9.36	.001
	.33(.8)$_a$	.83(1.3)$_a$	.50(.8)$_a$	3.33(1.8)$_b$	.50(.7)$_a$	3.75(1.6)$_b$		
Parent anxiety (STAI)							.47	NS
	31.42(9.9)$_a$	34.17(9.4)$_a$	29.50(9.9)$_a$	34.75(9.1)$_b$	31.67(9.9)$_a$	36.75(10.4)$_b$		

Note: different letter subscripts refer to significant mean differences within groups. Lower BOS scores indicate greater anxiety; Higher FACES and STAI scores indicate greater anxiety

PARENT REASSURANCE, APOLOGIES, OR CRITISISM

Results of an ANOVA showed that there was a marginally significant effect between groups for the number of reassurances, apologies, or criticisms, $F(2,35)=2.48$, $p=.10$. The comparison showed that the parents in the child life-directed distraction group provided the least amount of reassurances, apologies, or criticisms (M=3.67, SD=3.5), the parent-directed distraction group provided the second least (M=10.00, SD=9.6), while the parents in the control group provided the most (M=11.00, SD=11.2). Post hoc tests revealed that the child life group stated fewer reassurances, apologies, and criticisms than the parent group, $p=.09$, and the control group, $p<.05$ (See Figure 2).

Figure 2



Note:
* p<.05

CORRELATION ANALYSIS

A correlation analysis was performed to determine the relationship among the variables. Greater parental reassurance, apologies, or criticisms during immunization was related to greater child anxiety as rated by the researcher after the immunization (BOS post), greater child pain as rated by a blind researcher (FLACC), greater pain during the immunization as rated by the nurse (CHEOPS), and greater self-reported pain as rated by the child (TPS) (See Table 3).

Greater parental anxiety before the immunization (STAI pre) was related to greater parental anxiety after the immunization (STAI post), and greater child anxiety before the immunization (BOS pre) (See Table 3).

Greater child anxiety before the immunization as rated by the researcher (BOS pre) was related to greater child anxiety after the immunization as rated by the researcher (BOS post) (See Table 3).

Greater child anxiety after the immunization as rated by the researcher (BOS post) was related to greater self-reported child anxiety after the immunization (FACES post), greater child pain as rated by a blind researcher (FLACC), greater pain during the immunization as rated by the nurse (CHEOPS), and greater self-reported pain as rated by the child (TPS) (See Table 3).

Greater self-reported child anxiety after the immunization (FACES post) was related to greater child pain as rated by a blind researcher (FLACC), greater pain during the immunization as rated by the nurse (CHEOPS), and greater self-reported pain as rated by the child (TPS) (See Table 3).

Greater child pain as rated by a blind researcher (FLACC) was related the greater pain during the immunization as rated by the nurse (CHEOPS), and greater self-reported pain as rated by the child (TPS) (See Table 3).

Finally, greater pain during the immunization as rated by the nurse (CHEOPS) was related to greater self-reported pain as rated by the child (TPS) (See Table 3).

Table 3

Correlation Between Measures

Variables	1	2	3	4	5	6	7	8	9	10
1. # of Reassurances, Apologies, or Criticisms		.048	.146	-.048	-.352*	-.079	.216	.406*	.430**	.464**
2. STAI (Pre)			.734**	-.374*	-.035	.085	-.014	.031	-.117	.230
3. STAI (Post)				-.247	-.134	.014	.221	.226	.191	.304
4. BOS (Pre)					.408*	-.247	.011	-.230	-.095	-.145
5. BOS (Post)						-.165	-.662**	-.769**	-.730**	-.616**
6. FACES (Pre)							.150	.280	.224	.312
7. FACES (Post)								.671**	.721**	.580**
8. FLACC									.898**	.635**
9. CHEOPS										.630**
10. TPS										

Note:
* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

DISCUSSION

It is estimated that needle phobias range from 4.9% to 9% of the population; hence, stress-reducing interventions could impact a large group of people. If only 1% of the population suffers from needle phobia, this figure still amounts to more than 2.5 million people just in the United States alone (Bowen & Dammeyer, 1999). It is no secret that children fear needle sticks as proven by the fact that the question most frequently asked by children entering the doctor's office is whether or not they are going to receive a shot (Bowen & Dammeyer, 1999). In the current study, 10 out of 36 patients asked that question. And, of the 12 million injections given annually, approximately 5% of those injections are childhood immunizations (Taddio et al., 1999). It must be acknowledged that iatrogenic pain (pain caused by a physician) in children is not simply a short-lived experience that must be endured as part of routine medical treatment. Instead, this pain is a potential traumatic experience associated with long-term adverse effects that can be prevented as a result of well-researched and well-implemented medical care (Taddio et al.,2009).

It was hypothesized that a simple, easy-to-implement, and inexpensive distraction would be helpful for reducing children's pain perception and anxiety during routine immunizations. Specifically, it was predicted that children who were distracted by a child life specialist who asked the child to search for objects in an *I Spy* book during an immunization would report and be rated as experiencing less pain and anxiety than

children who were distracted by their parents, who also used an *I Spy* book, or a group with no distraction during their immunization. It was hypothesized that parents would not be good at distracting their child because the parent would be more distracted by their child screaming and crying and would worry about consoling their child rather than distracting the child. Parents are naturally anxious during their child's painful procedure interfering with their ability to perform successful distraction. In a review (meta-analyses) of previous studies involving parent-led distraction, the findings also showed that the two parent-targeted interventions were ineffective (Chambers et al., 2009).

The results from this study support that the psychosocial intervention of distraction by a child life specialist significantly decreased the pain and anxiety for children who were receiving an immunization at a general practitioner's office or at a pediatric doctor's office. Past research has shown that there is every reason to be optimistic that simple and inexpensive distraction techniques may be useful tools during routine immunizations. In one such study, distraction techniques were consistently more effective than simple verbal interaction and instructions with preschool children ages three to six years old (Bowen and Dammeyer, 1999). Interventions, such as distraction, have been shown to be beneficial to patient, family and healthcare provider.

This study found that the child's self-reported pain and anxiety decreased if the child received distraction from the child life specialist. In the current study, it was also documented that observers and nurses rated the children as experiencing less pain and anxiety when receiving the distraction from the child life specialist. These findings indicate that the distraction technique used by the child life specialist was consistently more effective than the parent providing the distraction or the children receiving no

distraction. Perhaps the technique used by the child life specialist to begin the distraction prior to the immunization and to continue the distraction following the immunization could explain why the child's anxiety and pain scores were better.

Overall, children who received the child life specialist distraction experienced less pain than the children who received either the parent distraction or no distraction at all when measured with the researcher pain scale, nurse pain scale, or self-reported scale. Additionally, from the nurse's point of view, the control group experienced the most pain. The nurses were unaware of the hypotheses of the study; however, because they were in the room, they were aware of which children were being distracted. And, even though the children in the parent distraction and group with no distraction had similar pain ratings on the researcher scale and self-reported scale, the children who did not receive any distraction still displayed higher scores when looking at the mean scores, furthers indicating that the children who received no distraction experienced the most pain.

Children who were distracted by the child life specialist experienced no change in of anxiety pre-to post-immunization as measured on the self-report anxiety scale and the researcher anxiety scale. In contrast, the parent-directed distraction group and the control group demonstrated a significant increase in anxiety scores pre-to post-immunization as measured on the self-report anxiety scale and the researcher anxiety scale. As was hypothesized, the control group reported the highest anxiety ratings post-procedural. It was thought that scores would be higher pre-immunization.

Parents in the child life specialist group provided the least amount of reassurances, apologies, or criticisms during the immunization. This was followed by the

parents in the group who provided the distraction, and lastly, the group where no distraction was provided. This can be explained as a result of the child life specialist encouraging the parents to be involved in the distraction by having them help the child find items in the *I Spy* book. On the other hand, parents in the group who provided the distraction seemed to be more concerned with reassuring their child instead of distracting them. In addition, the parents in the group where no distraction was provided only had that option of reassuring their child.

It was discovered that as parent reassurance, apologies, and criticisms increased, children became more anxious, according to the researcher ratings. Greater parental reassurances, apologies, and criticisms were also associated with greater child pain, as rated by the researcher and nurse. Apparently, the more the child screamed and cried during the immunization, the more the parent provided reassurance, apologies, and criticisms. Perhaps, parent behaviors brought negative attention to the children's pain and anxiety behaviors and served as a reinforcer. These results suggest that parent reassurance, apologies, and criticisms negatively affect children's mood and pain perception. An alternative explanation is that the parents' behaviors may have made the child more frightened or even mad because the child is looking to the parent for protection, but the parent is unable to help or make the child feel safe. The child is most likely wondering why the parent is telling them that it is going to be okay or that it will not hurt when this is exactly the opposite of what the child is experiencing. The reassurances, apologies and criticisms may cause the child to lose trust in the parent. In a study comparing the effects of parental distraction versus parental reassurance on coping and distress of children receiving immunizations, results supported the hypothesis that

children in the reassurance group would be more distressed. As was predicted, children in the reassurance group were restrained during a longer portion of the immunization process as well as three times more children had to be restrained. Also, children in the reassurance group displayed more verbal fear (Cohen, 2000).

Stress ratings for the parents in the child life specialist-led distraction group indicated that parents did not feel stressed as a result of the immunization procedure. However, in the parent-led distraction and control groups parents reported having more anxiety following the procedure. Parental anxiety before the immunization was also associated with parental anxiety after the immunization. This seems only natural because seeing your child crying and in pain would cause the parent to experience stress and anxiety as parents want to protect their children from pain and danger. Anecdotally, two parents became so emotionally distraught from seeing their child screaming and crying that they, too, began to cry. Additionally, parents may experience high levels of stress due to their fear of needles. The parents in the group where they provide the distraction reported the greatest increase in anxiety, followed by the group who received no distraction. Additionally, parental anxiety was associated with child anxiety pre-immunization suggesting that children of anxious parents are more anxious. Interestingly, parent stress did not correlate with the child's pain. Parents who are anxious may not be effective at distracting their children perhaps because they are too stressed to provide and implement appropriate distraction techniques. In fact, most parents who provided the distraction were not able to provide any form of distraction with the book, often laying the book down on the table to reassure or attempt to comfort their child.

It was discovered that children who were anxious before the immunization, as rated by the researcher, were also more anxious following the immunization. In addition, greater child anxiety, as rated by the researcher, after the procedure was associated with greater self-reported anxiety and greater pain, as measure by the researcher, nurse, and child's self-report. Greater self-reported child anxiety after the immunization was also related to greater child pain after the immunization. It can be hypothesized that children who were anxious before the procedure would continue to be anxious after the procedure because the child is still in the environment where the immunization took place. Also, the child who is anxious and scared after the procedure will relate those feelings towards experiencing more pain.

It was revealed that all three pain ratings for the child were correlated with one another. Greater pain, as measured by the researcher, was associated with greater pain as measured by the nurse, as well as greater self-reported pain ratings. It can be suggested that the more the child cried and squirmed, the more likely the observer was to rate the child as experiencing more pain.

Despite the strengths of this study, several limitations need to be addressed. One limitation of this study was that only four and five year olds participated in the study. The study may be replicated in the future using a wider range of ages. Additionally, the effects of child life distraction should be assessed for other needle stick procedures, such as IV insertion, blood draws, PICC's, broviacs, and dental injections. If a distraction as simple as searching in an *I Spy* book can help to alleviate the child's pain, then the research is warranted.

Any other distraction technique for future research may include such as "positioning for comfort;" whereby, children sit on the parent's lap, allowing for a feeling of safety. The child can either sit facing forward or chest-to-chest like they are being hugged. When children are forced to lie down in a supine position and are then restrained, they feel frightened and vulnerable, which leads to higher levels of stress and anxiety. Although the best results were achieved with the participation of a child-life specialist administering the distraction, parents and nurses should be trained in providing appropriate and effective distraction in the absence of a child life specialist.

In summary, the results of this study lend support for the use of child life-directed distraction during the administration of routine immunizations to help alleviate and reduce young children's pain and anxiety associated with needle sticks. In contrast, the findings revealed that parents are not very effective at distracting their children and may actually promote greater feelings of child anxiety and pain during immunizations. Not providing children with distractions during an immunization was also associated with greater child pain and anxiety. It is practical to say, however, that there will not always be a child life specialist available during pediatric medical procedure; therefore, given the potentially positive impact of distraction on pediatric procedural pain, it is imperative that parents and nurses become familiar, comfortable, and effective with the distraction process. Practice and perceived effectiveness of the use of distraction warrants further investigation to broaden our understanding of children's responses to these painful medical procedures and methods that may be useful to decrease or alleviate their pain during future healthcare procedures.

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