Parents' Positioning and Distracting Children During Venipuncture

Effects on Children's Pain, Fear, and Distress

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The purpose of this study was to determine the effectiveness of parental positioning and distraction on the pain, fear, and distress of pediatric patients undergoing venipuncture. An experimental-comparison group design was used to evaluate 43 patients (20 experimental and 23 comparison) who were 4 to 11 years old. Experimental participants used parental positioning and distraction. All participants rated their pain and fear; parents and child life specialists (CLS) rated the child's fear, and CLS rated the child's distress. Self-reported pain and fear were highly correlated ($p < .001$) but not significantly different between the two groups. Fear rated by CLS ($p < .001$) and parents ($p = .003$) was significantly lower in experimental participants. Although no difference was found in distress between the two groups, a significant time trend was discovered ($p < .001$). The parental positioning-distraction intervention has the potential to enhance positive clinical outcomes with a primary benefit of decreased fear. Further research is warranted.

Keywords: *distraction, positioning for comfort, parental participation, procedural-related pain, pediatric pain management, body-mind interventions*

Each year, approximately 30 million children experience visits to an emergency department (ED) in the United States (American College of Emergency Physicians, 2001). Venipuncture, a common health care

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procedure (Hodgins & Lander, 1997), and intravenous (IV) catheter insertion occur frequently in an ED, an environment where children typically have few choices and feel a lack of control (Bauchner, 1991; Hodgins & Lander, 1997; Vessey, Carlson, & McGill, 1994; Wong & Baker, 1988). Procedures involving needles are feared by many children (Wong & Baker, 1988); needles are considered painful and are associated with distress (Broome, Bates, Lillis, & McGahee, 1990; Colaizzo & Tesler, 1994; Goldberger, Gaynard, & Wolfer, 1990; Hodgins & Lander, 1997; Wong, 1993). The anticipatory fear caused by such situations may contribute to the intensity of pain and subsequent emotional distress, creating an increasing pain-emotional distress cycle (McGrath, 1993; Tesler, 1994). It is recommended that interventions be developed that target emotional and sensory processes to minimize the child's discomfort during such common procedures (McGrath, 1993).

Related Literature

Research has demonstrated that children who use active forms of coping report less pain (Broome et al., 1990; Lambert, 1999; Manne, Bakeman, Jacobsen, Gorfinkle, & Redd, 1994; Vessey et al., 1994) and display less behavioral distress (Manne et al., 1994) during an invasive procedure than children who do not. Coping strategies provide children with a greater sense of control and mastery of the experience (Broome et al., 1990; Colaizzo & Tesler, 1994; Ellis & Spanos, 1994; Fanurik, Koh, & Schmitz, 2000; Heiney, 1991; Hodgins & Lander, 1997; Lambert, 1999). To facilitate coping, the Agency for Health Care Policy and Research (AHCPR) recommends that parents be with their child before, during, and after medical procedures (AHCPR, 1992). Parental presence has been found to be helpful for children during painful procedures (Weiging & Tesler, 1994), although it is not consistently implemented by health care professionals (Bauchner, 1991; Broome, 2000; Ross & Ross, 1984).

Studies have demonstrated that direct coaching by parents on the use of distraction techniques increases the child's level of coping

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(Cohen, Blount, & Panopoulos, 1997; Manimala, Blount, & Cohen, 2000). However, the type of parental behavior demonstrated during such events influences the child's emotional response. High parental coping and low parental distress, for example, are strongly correlated with better coping and less distress in children (Blount, Schaen, & Cohen, 1999; Cohen et al., 1997; Frank, Blount, Smith, Manimala, & Martin, 1995). In contrast, distress-promoting behaviors of adults—specifically, parental anxiety—negatively influence the child's coping (Bauchner, 1991; Blount et al., 1997; Blount et al., 1999; Frank et al., 1995; Jacobsen et al., 1990). Parental reassurance alone, however, is associated with increased child distress and the need for physical restraints (Manimala et al., 2000).

The benefits of parental closeness in enhancing child and parent coping have been explored by a group of providers at Rainbow Babies and Children's Hospital in Cleveland (Stephens, Barkey, & Hall, 1999). These providers observed that forcing a child to lie flat on a treatment table during a venipuncture often resulted in loss of control, panic, crying, and struggling to get up. Recognizing that the supine position played a significant role in increasing the child's stress during venipuncture, the Cleveland practitioners developed a program of positioning for comfort during invasive procedures that includes a secure, parental-hugging hold and close physical contact during the procedure. They also observed that such positioning requires fewer people to complete the procedure, promotes the child's sense of control, and provides parents with an active role in supporting and comforting their child (Stephens et al., 1999).

In addition to parental closeness and positioning, parents also have been taught to use various distraction strategies during procedures. Distraction has been demonstrated to be an effective technique for coping with the pain, fear, and distress experienced during painful medical procedures (Broome, 1990; Lambert, 1999; Tesler & Weiging, 1994). Distraction, a cognitive, nonpharmacologic intervention, tends to refocus thinking by directing attention away from the pain associated with the procedure (McCaffery & Pasero, 1999; Tesler & Weiging, 1994) to a non-noxious stimulus in the immediate environment (Fernandez, 1986; McCaul & Malott, 1984). McCaul and Malott (1984) postulated that the effectiveness of distraction depends on the patient's interpretation of the pain experience and the diversional capacity of the distracter.

The effectiveness of a distracter is based on the perception that the painful stimuli can, in part, be controlled cognitively and is not

completely autonomic (McCaul & Malott, 1984). If the diversional capacity of a distracter is high, thus consuming most of one's attention, then less cognitive capacity exists for attending to the painful stimulation (McCaul & Malott, 1984; Vessey et al., 1994). An effective distracter should stimulate the senses and be developmentally appropriate, easily implemented, acutely engaging, and able to captivate and sustain a child's interest (Blount et al., 1999; Fanurik et al., 2000; Vessey et al., 1994).

Distracters that have been found to be effective in helping children cope with procedure-related pain include blowing bubbles (Fanurik et al., 2000; Lambert, 1999; Rusy & Weisman, 2000), movies (Fanurik et al., 2000), cartoons (Cohen et al., 1997), books (Fanurik et al., 2000; Lambert, 1999), party blowers (Manne et al., 1994; Manne, Redd, Jacobsen, Gorfinkle, & Schorr, 1990), nurse coaching (Cohen et al., 1997; Cohen, Cohen, Blount, Schaen, & Zaff, 1999), parent coaching (Lambert, 1999; Manne et al., 1994), guided imagery (Fernandez, 1986; Lambert, 1999; Rusy & Weisman, 2000), music (Fanurik et al., 2000; Rusy & Weisman, 2000), novel toys (Colaizzo & Tesler, 1994; Ellis & Spanos, 1994), Illusion Kaleidoscope (Carlson, Broome, & Vessey, 2000; Kleiber & Harper, 1999; Lambert, 1999; Rusy & Weisman, 2000; Vessey et al., 1994), counting (Rusy & Weisman, 2000), breathing (Kleiber & Harper, 1999; Lambert, 1999; Rusy & Weisman, 2000), video games (Rusy & Weisman, 2000), hypnosis (Ellis & Spanos, 1994; Lambert, 1999; Rusy & Weisman, 2000), and virtual reality glasses (Schneider & Workman, 2000; Wint, Eshelman, Steele, & Guzzetta, 2002).

In evaluating the potential effectiveness of these various strategies in reducing procedural pain and distress, scientific logic might dictate that parental presence, positioning for comfort, and distraction be compared to determine which strategy is the most effective. Rather than dissect these strategies into an either-or reductionistic approach, however, we believed that the next logical step was to investigate the combined, holistic potential benefits of these strategies (Guzzetta, 2004) in treating the emotional and sensory responses associated with painful procedures.

Purpose

The purpose of this study was to determine the effectiveness of a multimodal intervention package that consisted of parental

participation using positioning for comfort and distraction to divert attention on the level of pain, fear, and distress of pediatric patients undergoing venipuncture. To achieve this purpose, the following research questions were evaluated: (a) Are there differences in the child's self-reported ratings of pain and fear, observed fear, and observed behavioral distress between children whose parents participate in the use of a positioning-distraction intervention during venipuncture and those who receive standard care? (b) Is there a relationship between the child's self-reported ratings of pain and fear? (c) Is there a relationship between the child's self-reported ratings of fear and observer ratings of fear and behavioral distress?

Method

Design

This study used an experimental-comparison group design. A convenience sample of 43 pediatric patients who were undergoing venipuncture or IV insertion was randomly assigned to the experimental or standard-care comparison group by a table of random numbers.

Participants

Patients selected for the study were English speaking, between 4 and 11 years old, and had a medical order written for venipuncture or IV insertion. Children with chronic illness (e.g., cancer, cystic fibrosis, and sickle cell anemia) and those who presented with possible child abuse were excluded. Written informed consent was obtained from each parent before the start of the study. The study was conducted in the ED of a private, 322-bed, pediatric medical center in the Southwest and was approved by the hospital's Institutional Review Board.

Intervention

Three child life specialists (CLSs) received standardized instruction and training on (a) methods for obtaining informed consent, (b) how to use and teach parents and patients about the positioning-distraction intervention, and (c) methods of collecting demographic and outcome data. A nurse or a pediatric technician performed all

venipunctures or IV insertions. The procedure was divided into three time periods: (a) the preprocedural period was defined as the time from obtaining consent to just before the tourniquet was placed on the child's arm, (b) the procedural period included the time from the tourniquet being placed on the child's arm to the Band-Aid or tape being placed on the blood-draw/IV site, and (c) the postprocedural period included the period following placement of the Band-Aid or tape to completion of the child, parent, and CLS ratings of the procedure.

Children in the comparison group received the institution's standard care for venipuncture, including a full explanation of the procedure and parental presence for support. In addition to receiving the standard care, the experimental group's parents were taught by one of the CLSs, using a standardized script, how to position and distract their child during venipuncture. The two types of positioning used included side-sitting, wherein the parent sat in a chair next to the exam table and the child sat sideways on his or her lap, or chest-to-chest sitting, wherein the parent sat in a chair next to the exam table and the child sat on his or her lap chest-to-chest. The parent and patient decided which of the two types of positioning to use based on age and size of the patient and parent. In addition, all patients in the experimental group chose from one of three distraction items to use during the procedure. Distracters were selected on the basis of their level of sensory input, age-appropriate characteristics, recommendations found in the literature, and capacity for use without disturbing the procedure. First offered was the Illusion Kaleidoscope (Wildwood Creative Products, Sonora, California) in which glitter suspended in a fluid-filled tube passes before the lens when held to the eye; it requires no manipulation to change images. Patients also could choose the *I Spy: Super Challenger* book (by W. Wick & J. Marzollo, published by Scholastic, 1997) in which parents asked children to find items hidden on the page among multiple graphic designs. A child who chose *Thomas the Tank Engine's Big Lift-and-Look Book* (by Rev. W. Awdry, published by Random House, 1996) was encouraged to open flaps to find hidden items.

Following parental positioning, parents were instructed to engage their child with the distraction by asking the child repeated questions about the activity and reminding them to concentrate on what they were saying and what they were asking the child to do (e.g., "Look at colors in the Kaleidoscope. Tell me what you see." "Can you name all the red items on this page?" "Can you find anything else that is red?" "I wonder what is under this flap. Let's look together."). The use of the

distracter began when the tourniquet was placed on the child's arm and ended when a Band-Aid or tape was placed on the venipuncture or IV site.

Instrumentation

Demographic and clinical data were collected for all patients. The ease of the venipuncture or IV insertion was rated by the nurse on a scale from 1 (*very easy*) to 5 (*very difficult*). The FACES scale was used to measure the patient's perception of pain. It consists of six faces, ranging from very happy to very sad. Each face is assigned a Likert-type rating score from 0 (*no hurt*) to 5 (*as much hurt as you can imagine*). Wong and Baker (1988) reported reliability and validity of this tool for children 3 to 18 years of age. Following the venipuncture or IV insertion during the postprocedural time period, the child was asked to point to the face that represents "how much hurt (pain) you felt during the poke (venipuncture)."

The Glasses Fear scale was used to assess the child's fear. The Glasses scale (see Figure 1) is a variation of the visual analog scale (VAS) (Wong & Baker, 1988). The VAS is estimated to be a valid and reliable tool for measuring self-reports of subjective experiences such as pain and fear (Aiken, 1959; Gift, 1989). The child's version (Glasses Fear scale) consists of six cylinders, or "glasses." The first cylinder is empty and represents *no fear* (not scared at all). The other five cylinders are filled with increasing amounts of fear. The completely filled cylinder is the *most fear* (most scared). For statistical purposes, the glasses are assigned a value from 0 to 5. Wong and Baker (1988) reported test-retest reliability (> .70) and concurrent validity of the Glasses scale in rating painful procedures and consistency of responses when analyzed against five other pain scales in children ages 3 to 18. Although the Glasses scale was previously used to assess pain rather than fear, it is well documented that unpleasant symptoms such as pain, fear, and fatigue are subjective patient experiences that require self-report. For this study, the child was asked following the procedure to choose the glass that best described how scared (fearful) they felt during the poke (venipuncture) (Whaley & Wong, 1987). The parent and CLS also assessed the child's level of fear using the Glasses Fear scale during the preprocedural and postprocedural time periods.

The Procedural Behavior Checklist (PBCL), a behavioral observation scale, was used to measure behavioral distress. The PBCL

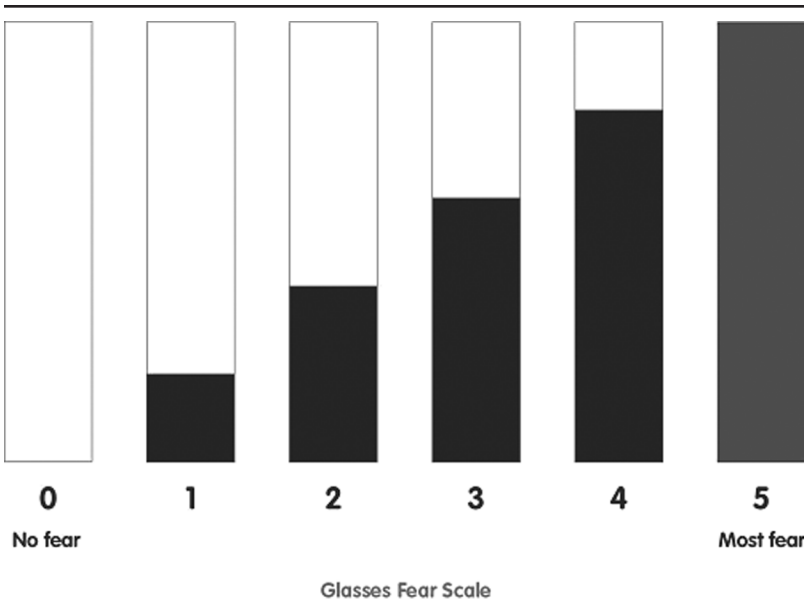

Figure 1: Glasses Fear Scale.

contains eight behaviors that children exhibit during painful procedures. The intensity of each behavior is rated on a scale of 0 (*none*) to 5 (*extremely intense*). Scores range from 0 to 40, with a high score indicating extremely intense distress (Broome, 1991). The PBCL is a revised version of the Procedural Behavior Rating Scale (PBRS) (Katz, Kellerman, & Siegel, 1980). Studies have demonstrated that the PBRS is sensitive to fluctuating levels of children's distress (Jacobsen et al., 1990; LeBaron & Zeltzer, 1984; Manne et al., 1990) and has an interrater reliability of .80 and above (Broome, 1991; Ross & Ross, 1988). For this study, a CLS assessed the child's level of distress during the preprocedural, procedural, and postprocedural time periods. To establish interrater reliability of the PBCL, the three CLSs who were trained in the use of the PBCL simultaneously observed 13 patients undergoing painful procedures and independently recorded their PBCL scores. A Pearson's *r* was calculated for the total scores of each set of paired observations, resulting in an interrater reliability coefficient of .84 before enrolling the first patient in the study.

Data Analysis

Data were entered into Microsoft Excel and analyzed using SAS, Version 8.0. Two-tailed p values of less than 0.05 were considered to be significant. Comparisons between participants in experimental and comparison groups based on demographic (i.e., age, gender, race) and clinical characteristics (i.e., diagnosis, previous sticks, number of needle stick attempts, and ease of the venipuncture) as well as scores for pain and fear rated by the child were performed using a t test, chi square, or Fisher's exact test. Agreement between the child's self-reported levels of pain and fear as well as between the child's self-reported levels of fear and observed ratings of distress were evaluated by Kendall's tau. Using a difference score, formed by subtracting the preprocedural observed fear score from the postprocedural fear score, a one-factor within (types: CLS and parent) and a one-factor between (group: experimental and comparison) ANOVA was performed. Post hoc pairwise comparisons were completed using the Bonferroni technique of dividing the overall alpha level by the number of comparisons performed for significant ANOVAs. The distress scores rated by the CLS during the preprocedural, procedural, and postprocedural time periods were not normally distributed, and a log transformation did not improve the normality. Thus, the scores were rank ordered before analysis in a one-factor (time) and a one-factor between (group) ANOVA. A trend analysis was done to determine any differences in distress scores among the preprocedural, procedural, and postprocedural time periods. Agreement between the child's level of self-reported fear and observed levels of fear was calculated using Cohen k, an index of agreement beyond that expected by chance. (A k of 0.81 to 1.0 indicates almost perfect agreement; 0.61 to 0.80, substantial agreement; 0.41 to 0.60, moderate agreement; 0.21 to 0.40, fair agreement; 0.01 to 0.20, slight agreement; and 0.00, poor agreement; Dunn, 1989; Landos & Koch, 1977.)

Results

Demographic and Clinical Characteristics

A total of 43 participants were enrolled in the study, with 23 (53.5%) in the comparison and 20 (46.5%) in the experimental group. As shown in Table 1, participants ranged in age from 4 to 11, with a mean

TABLE 1
Demographic and Clinical Characteristics of Patients

	Comparison (n = *23*)	*Experimental* (n = *20*)	*Total* (n = *43*)	p *Values*
Age, years				0.66
Range	4.35-10.55	5.35-10.34	4.35-10.55	
M ± *SD*	7.77 ± 1.89	8.02 ± 1.58	7.88 ± 1.74	
Gender				0.18
Male	8 (35)	11 (55)	19 (44)	
Female	15 (65)	9 (45)	24 (56)	
Race				0.17
Caucasian	5 (22)	11 (55)	16 (37)	
African-American	7 (30)	3 (15)	10 (23)	
Hispanic	8 (35)	5 (25)	13 (30)	
Other	3 (13)	1 (5)	4 (10)	
Diagnosis				0.79
Surgical	5 (22)	6 (30)	11 (26)	
Trauma	3 (13)	4 (20)	7 (16)	
Vomiting	5 (22)	4 (20)	9 (21)	
Other medical	10 (43)	6 (30)	16 (37)	
Previous number of venipunctures				1.0
0	13 (75)	12 (60)	25 (58)	
1	9 (39)	7 (35)	16 (37)	
2	1 (4)	1 (5)	2 (5)	
Number of needle stick attempts				0.54
1 Attempt	17 (61)	17 (71)	34 (65)	
2 Attempts	9 (32)	7 (29)	16 (31)	
3 Attempts	2 (7)	0 (0)	2 (4)	
Ease of venipuncture				1.0
1 = Very easy	13 (57)	12 (60)	25 (58)	
2 = Easy	4 (17)	3 (15)	7 (16)	
3 = Somewhat easy	3 (13)	4 (20)	7 (16)	
4 = Difficult	2 (9)	1 (5)	3 (7)	
5 = Very difficult	1 (4)	0 (0)	1 (3)	

NOTE: Values are numbers followed by (percentage) unless otherwise indicated.

age of 7.88 ± 1.74 years. Slightly more than half of them were females (56%), and the majority (67%) were either Caucasian (37%) or Hispanic (30%). Fifty-eight percent of the patients had no previous history of a venipuncture or IV insertion, whereas 37% had one such experience in the past, and 5% had experienced one of the procedures twice. The venipuncture or IV start was successfully completed on the first attempt in 79% of the patients. The majority of venipunctures

(74%) were rated by nurses as very easy or easy to perform. In the experimental group, all parents/patients chose the side-sitting position for comfort. In addition, 16 (80%) participants chose the book *I Spy: Super Challenger* for distraction during the procedure, 2 (10%) chose *Thomas the Tank Engine's Big Lift-and-Look Book*, and 2 (10%) chose the Illusion Kaleidoscope.

No significant differences were found between the participants in experimental and comparison groups based on age, gender, race, diagnoses, previous number of venipunctures, number of needle stick attempts, or rating the ease of venipuncture (see Table 1). There were no significant differences at baseline between the experimental and comparison groups for fear rated before the procedure by the CLS ($p = .45$) or the parent ($p = .73$) or for distress rated before the procedure by the CLS ($p = .57$).

Pain

Self-reported pain scores for the total group ranged from 0 to 5 with a mean of 2.53 ± 1.74, indicating moderate discomfort during the procedure as perceived by the patient. The self-reported mean pain scores were 2.3 ± 1.87 for those in the experimental group and 2.74 ± 1.63 in the comparison group. Although no significant difference was found in the children's rating of their pain between the two groups, self-reported pain scores tended to be lower in the experimental group ($p = .68$; see Figure 2).

Fear

Self-reported fear scores rated by the total group ranged from 0 to 5, with a mean score of 2.47 ± 1.84 also indicating moderate fear during the procedure. The self-reported mean fear scores were 2.15 ± 1.81 for those in the experimental group and 2.74 ± 1.86 for comparison participants. Although these scores were not significantly different between the two groups, the statistical probability was $p = .058$, indicating that fear scores tended to be lower in the experimental group (see Figure 2). In addition, the children's rating of their own pain was highly correlated with their own ratings of fear ($\tau = .59$, $p < .001$), indicating a direct relationship between pain and fear. Observed fear was found to be significantly different between the two groups ($p = .04$). Fear scores were lower in the experimental participants than in the comparison participants as rated by the CLS ($p < .001$; see Figure 3)

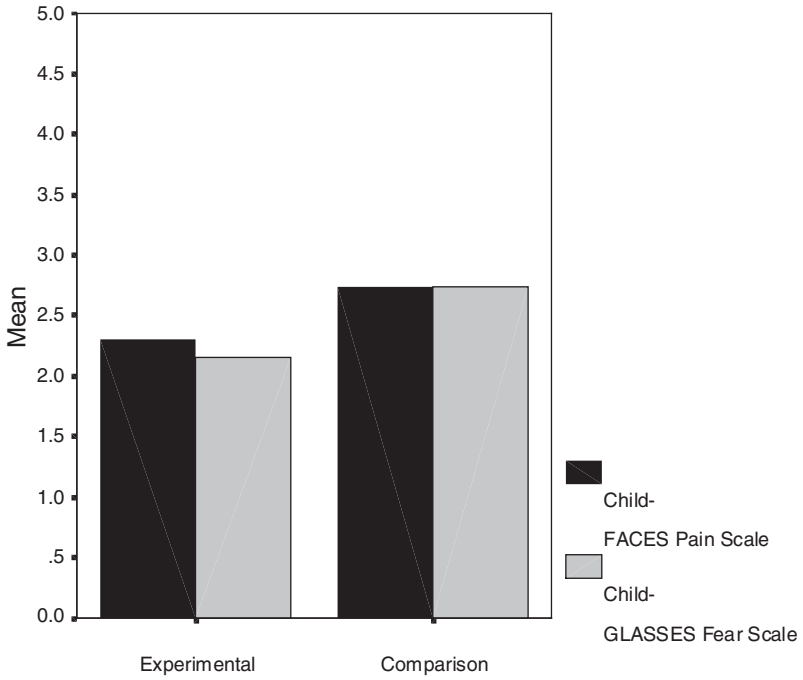

Figure 2: Pain and Fear Scores Reported by Patients in the Experimental and Comparison Groups.

and the parent ($p = .003$; see Figure 4). There was moderate agreement between the child's self-report ratings of fear and the fear ratings assessed during the postprocedural period by the CLS ($k = .41$) and the parent ($k = .42$).

Behavioral Distress

The mean distress scores for the entire group as rated by the CLS during the preprocedural, procedural, and postprocedural time periods were 11.37 ± 5.57 (range 1 to 34), 15.14 ± 8.38 (range 8 to 36), and 9.56 ± 3.13 (range 2 to 20), respectively, indicating an overall moderate level of distress. Although there was no difference between the experimental and comparison groups for distress as rated by the CLS, ($p = .13$), there was a significant difference among the three time peri-

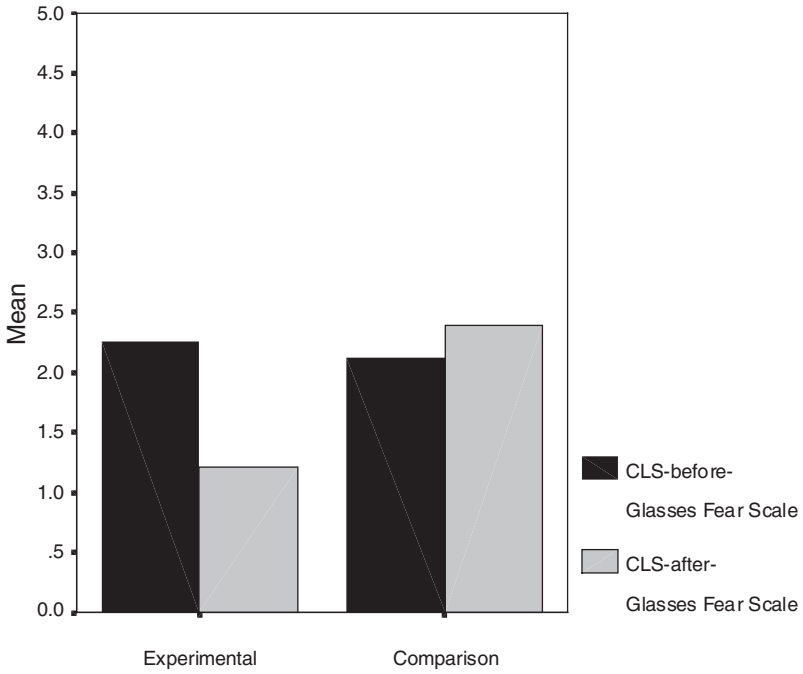

Figure 3: Fear Scores Before and After the Procedure Observed by the Child Life Specialist Between the Experimental and Comparison Groups.

ods ($p < .001$). A significant quadratic trend was found between the preprocedural, procedural, and postprocedural distress scores, indicating a significant difference across each of these three time periods ($p < .001$; see Figure 5). As expected, this trend revealed that both groups demonstrated the same preprocedural levels of distress, a significant rise in distress during the procedure, and a significant fall following the procedure. Although not statistically significant (see Figure 5), distress scores were higher in comparison participants during the procedure and did not return to or fall below baseline following the procedure as was seen in the experimental group. In addition, there was a high correlation between the child's rating of his or her fear and the CLSs ratings of behavioral distress during the procedure ($\tau = .49$, $p < .001$) and after the procedure ($\tau = .39$, $p = .002$).

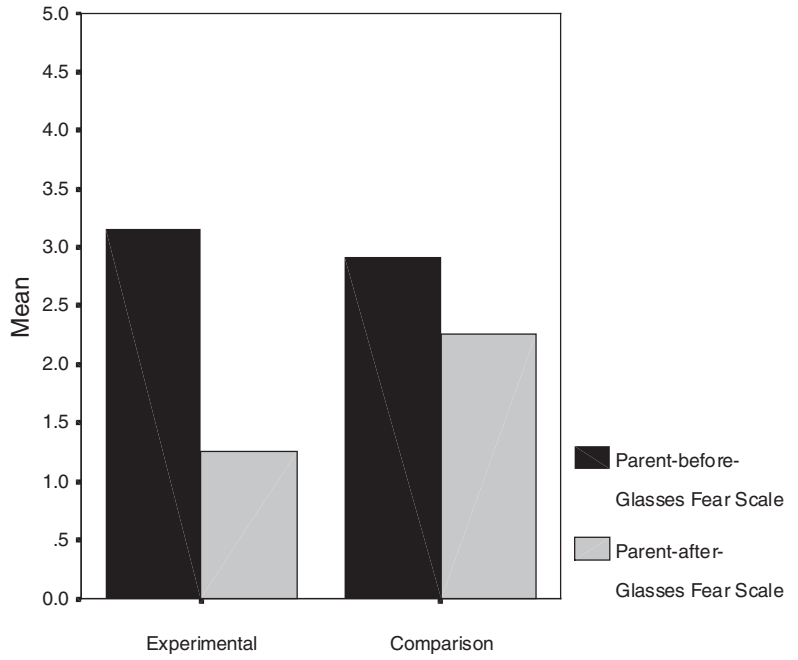

Figure 4: **Fear Scores Before and After the Procedure Observed by the Parent Between the Experimental and Comparison Groups.**

Discussion

The results of this study indicate that children whose parents used a positioning-distraction intervention demonstrated significantly less fear, as assessed by both the CLS and parent, during their venipuncture than children who received standard care. Although levels of self-reported pain, self-reported fear, and observed distress were not statistically different between the two groups, all of these measurements tended to be lower in the experimental group. Because this observation demonstrates that descriptively, the same pattern occurred consistently across all the outcome measures, it provides evidence that further investigation is warranted.

Our findings add to the growing body of knowledge aimed at developing effective body-mind pain management interventions for

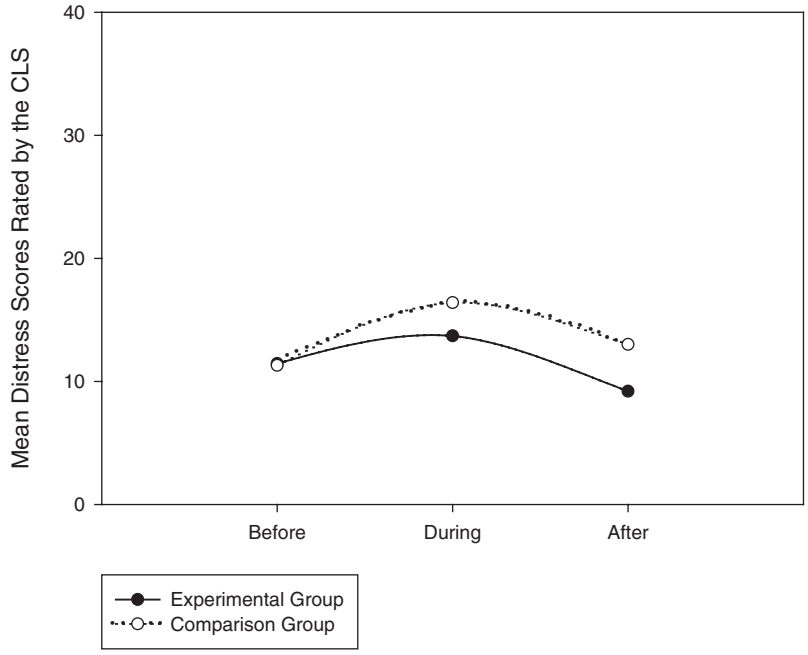

Figure 5: **Statistically Significant Quadratic Trend for Distress Scores Observed by the Child Life Specialist During the Preprocedure, Procedure, and Postprocedure Time Periods Between the Experimental and Comparison Groups.**

children. The effects of distraction on pain and observed behavioral distress in children during invasive procedures have been studied extensively and were evaluated in a 1999 meta-analysis (Kleiber & Harper, 1999). Distraction was found to be effective in reducing observed distress in 16 studies, whereas the effects of distraction on self-reported pain in 10 studies were not as strong and were found to be influenced by moderator variables (i.e., age and type of procedure) (Kleiber & Harper, 1999). Studies conducted in 1999 (Cohen et al., 1999) and 2000 (Fanurik et al., 2000) also documented the effectiveness of distraction in reducing behavioral distress. Some studies have documented a reduction in self-reported pain (Blount et al., 1997; Lambert, 1999), whereas others have not (Hodgins & Lander, 1997). For example, in 1994, self-reported pain and observed distress were

found to be reduced using a kaleidoscope for children undergoing venipuncture in an ED (Vessey et al., 1994), although in a later, multicenter study, which again used the kaleidoscope for distraction in the ED, no reductions in pain or distress were found (Carlson et al., 2000).

Differences in outcomes found in various pain-intervention studies may, in part, reflect differences in the measurement tools used. The FACES pain scale, which has been used extensively in previous research, is the preferred pain scale for children ages 3 to 18 (Wong & Baker, 1988). The results of our study, which revealed no differences in self-reported pain between the two groups, are similar to the findings of Manne and colleagues (1990), who also used this same scale for self-reports of pain during venipuncture. It is possible that the limited statistical variability associated with the 5-point FACES scale makes it insufficiently sensitive to detect subtle changes exerted by interventions aimed at reducing procedural-related pain. In the future, researchers might consider other self-report scales, such as the Color Analogue Scale (McGrath et al., 1996), which resembles but is less onerous than the VAS, has ratio scaling properties, and has the potential for greater sensitivity in measuring pain.

Measuring the level of anxiety associated with painful procedures is being used more extensively in research. Various approaches to measuring anxiety include self-reports of fear and observed behavioral ratings of distress (Katz et al., 1980). If self-reports of fear and observed distress are, in fact, measuring the level of anxiety associated with pain, then both measures, which should be correlated, could furnish a broader view of anxiety than either fear or distress alone. We wanted to provide the child with a visual scale by which to rate fear. Therefore, we adapted the Glasses Fear scale to one that would measure the subjective experience of fear. Children in our study understood the concept of filling a glass with less or more, and the researchers had no difficulty in administering this tool to children. Because children's self-reported levels of fear were highly correlated with their self-reported levels of pain and demonstrated moderate agreement with observed levels of fear as rated by the CLS and parent, the construct (convergent) validity of the Glasses Fear scale was strengthened.

The PBCL was an effective tool in differentiating behavioral distress across the preprocedural, procedural, and postprocedural time period. Moreover, construct validity of the Glasses Fear scale also was estimated in this study by the high correlation between the participant's self-rating of fear and the PBCL rating of distress by the

CLS. This relationship suggests that the distress behaviors that are being observed are related to and consistent with what the subject is experiencing and self-reporting. It is suggested that although self-report is important when measuring subjective phenomena such as fear, behavioral observations of anxiety are also advantageous. Behavioral observation provides an opportunity for more fully assessing the effect of intense stress on generally normally functioning children in an ED and evaluating how much stress might be altered as a result of a variety of interventions (Katz et al., 1980). Thus, as a result of the findings from our study, we recommend that the Glasses Fear scale be used together with the PBCL as a multidimensional measure of procedural-related anxiety.

Limitations

This study has several limitations. The small sample size and wide age range limit generalizations about the effect of the positioning-distraction intervention on all outcome variables measured. Similarly, child life specialists, who have a vested interest in reduction of pain and fear in children using these types of interventions, were used to rate the child's fear and discomfort. The study should be replicated with a larger sample and with children undergoing other painful procedures whose length and intensity differ from venipuncture. In addition, the Glasses Fear scale has not been used previously in studies to rate fear. Although the high correlations in this study between self-reported fear and observed fear and distress strengthens the construct validity of this scale for rating fear, further research should be done to estimate its validity and reliability.

No participant in this study received a topical anesthetic for reducing the discomfort of needle insertion. Subsequently, our institution implemented a policy in which all patients who are undergoing nonemergent needle insertions receive a topical anesthetic. Had this study been conducted after the implementation of this policy, topical anesthetics would have been included as standard care for participants in both the experimental and comparison groups. Because of the strong evidence demonstrating the effectiveness of topical anesthetics in significantly reducing children's distress and pain during needle sticks (Evers, Von Dardel, Juhlin, & Vinnars,1985; Hallen & Uppfeldt, 1982; Lander, Hodgins, Nazarali, McTavish, & Friesen, 1996; Robieux, Kumar, Radhakrishnan, & Koren, 1991; Young, Schwartz, &

Sheridan, 1996), we recommend they be incorporated into future research designs.

Implications for Practice

Parental participation using positioning and distraction represents a holistic intervention package that integrates current best evidence to sustain the integrity of the whole child during a painful procedure. It honors the importance of the family unit, promotes the parent's and child's capacity for the highest level of participation in care, fosters independence by offering choices, refocuses the child's cognitive attention away from the fear and pain, and partners and collaborates with the child and parent in creating a strategy that empowers them both to cope with the health care event. It also is likely that parental presence, positioning for comfort, and distraction exert a synergistic effect during a painful procedure that has greater impact on patient outcomes than any one of these interventions alone.

The results of the present study support the practice of family-centered care for children (Broome, 2000) and provide the framework for offering the option of family presence during invasive procedures as recommended by the Emergency Nurses Association (2001). Our findings are consistent with the results of other studies indicating that parents need to be given a clear role, guidance, and coaching to maximize their presence in facilitating a child's coping (Bauchner, 1991; Broome, 1990, 2000; Cohen et al., 1997; Colaizzo & Tesler, 1994; Fanurik, Koh, Schmitz, & Brown, 1997; Goldberger et al. 1990; Kristensson-Hallstron, 1999; Manne et al., 1994; Rusy & Weisman, 2000). Moreover, children's distress (Naber, Broome, & Rehwaldt, 1995) and parents' anxiety (Bauchner et al., 1996) have been found to be reduced when parents receive guidance on providing positive parental attention and physical closeness with their child.

As a result of this study, we found that parents were readily available, willing to participate in providing support for their child, and easily instructed regarding their role. It is likely that the established relationship between a parent and child enabled parents to successfully position the patient and maximally divert their thoughts from the procedure to the distraction. Thus, involving parents as active participants and providing them with specific and clear instructions about their role likely augmented the potential benefits of their presence. Likewise, in the ED, where children are often

subjected to painful procedures over which they have no control, the positioning-distraction intervention allowed the children to choose both the position and type of distraction they wished to use. Such choices have the potential to increase the child's feeling of control, encourage their cooperation, and positively affect their coping in future experiences.

Our observations are also consistent with the theoretical assumptions on which positioning for comfort is based. We found that allowing the child to sit on the parent's lap reduced the resistance and fear often observed in comparison patients who routinely were required by to lie flat on the treatment room table prior to the procedure. Positioning for comfort allowed caregivers to participate in positive assistance rather than negative restraining, it immobilized the extremity during the venipuncture, and it provided parents with an active role in supporting and comforting their child (Stephens et al., 1999).

The distracters selected for this study had multiple benefits. They gave patients a choice, were inexpensive and readily available, required minimal staff teaching time, were easily learned by both patients and families, and were of no risk to the patients. Eighty percent of the children chose the *I Spy: Super Challenger* book, which perhaps indicates the appeal this book has for the 4- to 11-year-old age group. This book offers several advantages. It was physically large (18″ × 17″ when opened), often blocking the visual field from the procedure; the pictures immediately engaged and sustained the child's attention; the variety of items depicted made it appropriate across a diverse age range; and it is culturally neutral. Parents were successful in using the book to quickly distract their child.

Conclusions

The study findings suggest that parent participation in an intervention procedure that includes positioning and distracting children during venipuncture and IV procedures has the potential to enhance positive clinical outcomes, with a primary benefit of decreased fear. This intervention—which promotes both patient and family participation in care, fosters independence, and refocuses the child's attention away from the painful event—is intended to maintain the integrity of the whole child during a painful procedure The positioning-distraction intervention is an age-appropriate, inexpensive, and easy-to-use nonpharmacologic adjunct to conventional standards of care. Based on the

findings demonstrated in this study and the need to establish research-based practices for managing procedure-related pain in children, future research investigating the clinical application of the positioning-distraction intervention is warranted.

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