Journal of Pediatric Psychology, Vol. 27, No. 8, 2002, pp. 749–757

A Child-Focused Intervention for Coping With Procedural Pain: Are Parent and Nurse Coaches Necessary?

Lindsey L. Cohen, PhD, ***Rebecca S. Bernard,*** MA, ***Laurie A. Greco,*** MA, and ***Catherine B. McClellan,*** MA
West Virginia University

Objective: **To examine the efficacy of training children to cope with immunization pain without the assistance of trained coaches and determine whether untrained parents or nurses are more effective at decreasing children's distress.**

Methods: **We compared the procedural coping and distress behavior of 31 3- to 7-year-old children trained in coping skills to 30 who did not receive training. The behavior of the untrained parents and nurses was evaluated as it related to child coping and distress.**

Results: **Children demonstrated understanding of the training, but they did not use the coping skills during the procedure. In general, the nurses' behavior was associated with child coping and parents' behavior with child distress.**

Conclusions: **More extensive child training or the involvement of coaches for procedural distress might be necessary. Nurses' behavior appears to center on encouraging child coping, and parents tend to comfort child distress.**

Key words: *pediatric; procedural distress; coping; coaching; immunization; pain.*

Children's distress associated with medical procedures has been a long-standing concern of pediatric clinicians and researchers (Blount, Powers, Cotter, Swan, & Free, 1994; Jay, Ozolins, Elliott, & Caldwell, 1983; Manne et al., 1990). Health care professionals have the dual challenges of providing necessary medical treatment and also preventing any unnecessary discomfort. Unfortunately, these goals often are incompatible. For example, it has been shown that children have negatively distorted expectations of distress prior to immunizations (Cohen et al., 2001) and that as many as 62% of children experience significant anxiety prior to surgery (Brophy & Erickson, 1990). In fact, children undergoing bone marrow aspirations for cancer can have such intense anticipatory distress that they experience nausea, vomiting, rashes, and insomnia in the days preceding the actual medical procedure (Jay et al., 1983). Children's distress behaviors during even routine minor procedures can be sufficiently severe to interfere with and delay the procedure and necessitate additional staff assistance. For example, Blount et al. (1992) found that 56% of children require physical restraint during routine immunizations. There is also evidence

All correspondence should be sent to Lindsey L. Cohen, Department of Psychology, 1124 Life Sciences Building, West Virginia University, Morgantown, West Virginia 26506–6040. E-mail: Lindsey.Cohen@Mail.WVU.edu.

that children are troubled by memories of cancer treatments (e.g., lumbar punctures) for extended periods of time (Kazak, Penati, Waibel, & Blackall, 1996). Whereas anesthesia is proving to be quite effective for the pain associated with more invasive procedures, such as those involved in cancer treatment, "routine" procedures such as immunizations and venipuncture continue to cause unnecessary suffering for children.

The majority of assessment studies of children's medical procedures identify factors that will assist in the development of effective distress-management interventions. For example, based on the finding that most children do not spontaneously cope with distressing medical procedures (Dahlquist et al., 1986), it was recommended that adult coaches should assist children during the procedure. In fact, almost all subsequent treatment studies have employed adult coaches, whether or not the children underwent coping skills training (e.g., Blount et al., 1992; Cohen, Blount, Cohen, Schaen, & Zaff, 1999; Jay, Elliot, Katz, & Siegal, 1987; Manne et al., 1990). In a recent review of the effective treatments for children's procedural distress, all 13 of the studies incorporated adult coaching (Powers, 1999), with the majority of the studies demonstrating effective coaching provided by the nurses (e.g., Cohen, Blount, & Panopoulos, 1997) or the parents (e.g., Jay, Elliot, Ozolins, Olson, & Pruitt, 1985; Kazak et al., 1996).

Given that so many studies have implemented adult coaches to assist children, it is surprising that so few have examined whether the parents or the medical staff is more influential in lowering children's procedural distress. In one of the only direct comparisons of the effects of parent versus staff behavior, Frank, Blount, Smith, Manimala, and Martin (1995) found that, whereas both parent and staff behavior predicted child coping behaviors, only parent behavior predicted child distress. Specifically, parent behavior accounted for 25% of the variance in child coping, and staff behavior accounted for a statistically significant additional 13% of the variance. However, whereas parent behavior accounted for 53% of the variance in child distress, staff behavior did not significantly add to the prediction of child distress. Sweet and McGrath (1998) reported similar findings in a study comparing mothers' versus staffs' behavior in the prediction of infants' distress during immunizations. Results indicated that specific mothers' behaviors (e.g., reassurance) predicted an increase in infants' distress, whereas staffs' distraction coaching behavior (e.g., distraction) predicted a decrease in infants' distress. Taken together, these two studies provide some preliminary evidence that staff behavior is more associated with child coping, and parent behavior is more related to child distress. However, these studies examined the behavior of parents and staff who received no training in effective coaching; with little training, parents prove to be excellent coaches (e.g., Cohen et al., 1997). In addition, these studies of aggregate group behavior do not illustrate that some parents are naturally quite adept at assisting their distressed children without training.

Although research has shown that adult coaching is an effective way to reduce child distress during medical procedures, questions about the benefits of training children in coping skills deserves additional attention. In fact, in the studies in which children did learn coping skills (e.g., Blount et al., 1994), coaches also were used, making it nearly impossible to tease apart the benefit of children's coping versus adults' coaching. In other words, dismantling research is in order (Powers, 1999). There may be inherent benefits to children coping on their own. For example, children might experience increased competence and subsequent enhanced self-efficacy if they are able to independently cope with challenging events, such as painful medical procedures (Bandura, 1977). Further, children might apply the newly learned skills to other medical procedures and possibly nonmedical stressors. In fact, there is evidence that children consistently use coping strategies across situations (e.g., Donaldson, Prinstein, Danovsky, & Spirito, 2000).

The purposes of this study were twofold. First, we examined the effects of training children in coping skills on procedural distress in the absence of trained adults to coach the children. Second, in a replication and extension of Frank et al. (1995) and Sweet and McGrath (1998), we compared the influence of untrained parents' versus untrained nurses' behaviors on child distress and coping. We expected that trained children would use the coping skills and display enhanced coping and decreased distress behavior. We also hypothesized that parent behavior would be related to child distress and staff behavior to child coping.

Method

Study Site and Participants

Both a university institutional review board and a health department administration approved the in-

vestigation. The study was performed at a health department in the rural northwestern United States during August and September. All children who presented at the clinic to receive their school entry immunizations were eligible for participation. Of the 66 families approached, only 5 declined participation, and all of these refusals were due to time constraints. Consistent with the demographics of this region, all participants were Caucasian and from lower to middle class; average family income was $37,304.36 (*SD* = $19,203.80). Sixty-one children (34 boys and 27 girls) ranging in age from 3.73 to 6.94 years (*M* = 5.37, *SD* = 0.63) served as participants. Mothers accompanied 46 participants; fathers, 6 participants; and grandparents and other relatives, 7 participants; these guardians' ages ranged from 18.88 to 73.59 years (*M* = 33.03, *SD* = 8.44). For simplicity, all the relatives who accompanied the child participants will be referred to as "parents" here. All children received their school entry immunizations consisting of diphtheria and tetanus taxoids and pertussis vaccine (DTP) and a live attenuated measles-mumps-rubella vaccine (MMR).

Measures

Demographic Form. To obtain parent and child demographic information, parents completed a questionnaire assessing participant date of birth, race, gender, and family income.

Ratings. Children completed self-report measures assessing their perception of procedural distress, pain, and how fearful they were of future injections. The specific questions were as follows: "How upset were you during the shot?" "How much did the shot hurt?" "How scared are you about the next time that you have to get a shot?" Children responded by choosing one of five computer generated "smiley" faces in which the mouth had been altered so that the faces ranged from a smile to a frown. A research assistant blind to the study hypotheses described to the children the meaning of each of the five faces (e.g., "See this smiling face? This face was not upset at all during the shot. Now this face wasn't upset either, but it was a little bit more upset than this one").

Parents and nurses completed visual analog scale (VAS) ratings to describe their perception of child procedural distress. The VASs were 100-mm horizontal lines with endpoint anchors of "Not Distressed" and "Very Distressed." The parents responded to the question, "Compared to other same-age children, how much distress did your child appear to experience?" The nurse answered, "Compared to other same-age children, how much distress did this child appear to experience?"

Observational. The Child-Adult Medical Procedure Interaction Scale-Short Form (CAMPIS-SF; Blount, Bunke, Cohen, & Forbes, 2001) assessed children's, parents', and nurses' behavior. Consistent with the revised CAMPIS (CAMPIS-R, Blount, Sturges, & Powers, 1990; Blount et al., 1997), the CAMPIS-SF includes the following four primary codes anchored by behavior subcodes: child coping (i.e., nonprocedural talking, engaging in distraction, humor), child distress (i.e., crying; screaming; verbally resisting the procedure; verbalizing pain, fear, and negative emotional comments; requiring restraint; flailing), adult coping promoting (i.e., distracting behavior, nonprocedural talking, commanding to cope), and adult distress promoting (i.e., reassuring, empathizing, criticizing, apologizing, giving control, providing physical comfort). The two adult codes imply a causal relation, with the adult behavior evoking either coping or distress in the child. To capture the coping skills children learned in this study, deep breathing and positive self-comments were added to the child coping code.

The CAMPIS-SF provides overall frequency of behavior scores for each of the primary codes on a 5-point scale (1 = none or one, 2 = minimal or few, 3 = moderate or adequate, 4 = substantial or considerable, and 5 = maximum or nearly continuous). Two undergraduate research assistants were trained in the coding system. Both observers coded an additional 12 randomly selected participants (20% of sample) to assess interrater agreement. Weighted kappa coefficients revealed excellent interrater reliability. The specific kappa coefficients were as follows: child coping, .89; child distress, .90; parent coping promoting, .82; parent distress promoting, .87; nurse coping promoting, .76; nurse distress promoting, .90.

Procedure

The health department receptionist informed all parents of children due to receive their school entry immunizations of the research project. Interested parents were directed to a research assistant in the waiting area to receive additional information. The research assistant informed the parents that their children would be taken to another room to watch one of two videos: one video would provide instruction in coping skills and the other would not. Assisted by the research assistant, parents completed the consent forms and demographic questionnaire. Children were assigned, on an alternating basis, to either the coping skills (*n* = 31) or control (*n* = 30)

conditions. Neither the parents nor the nurse was informed as to the condition assignment. Following the immunization, the parent, child, and nurse completed questionnaires assessing their impressions of child procedural distress.

Coping Skills. The treatment was designed to be as practical (i.e., time-efficient, cost-effective) as possible while containing the proven components of filmed models (e.g., Melamed & Siegel, 1975) and coping skills (e.g., Jay et al., 1985). When the parent was completing preprocedure questionnaires, a research assistant escorted children assigned to the coping skills intervention to an office in the health department. Children then viewed a 7-minute video that began with a researcher explaining the use and benefit of "snake breathing" (i.e., deep breathing while making a hissing sound) and positive self-statements (i.e., "I am cool and calm"). Next, the video showed a gender-matched, same-age child who taught and modeled the "snake breathing" and positive self-statement to use throughout the immunization procedure. In accord with the directions on the video, the participating children practiced the skills several times. The research assistant ensured that the children were able to perform the two skills at least three times prior to returning to their parents in the waiting room.

Control. Children in the treatment condition were led to the office and also watched a 7-minute video. In this tape, the researcher on the video informed children that people handle immunizations in various fashions, but he did not have any specific suggestions. Next, a same-gender- and age-matched model was shown sitting quietly, without engaging in any skills. Children then returned to their parents in the waiting area.

Results

Preliminary Analyses

A multivariate analysis of variance (MANOVA) was conducted to determine whether gender, age, and family income were related to any of the dependent variables (i.e., child distress ratings and codes, nurse behavior, parent behavior). Specifically, age and income were considered as potential covariates and gender as the between-subject variable. None of these variables was significantly associated with any of the dependent variables and thus were not considered in subsequent analyses.

Regression Analyses

Prediction of Child Behavior. Two hierarchical regression analyses were conducted to examine the relative contributions of child training, parent coping promoting, parent distress promoting, nurse coping promoting, and nurse distress promoting in predicting: (1) child coping and (2) child distress. In both analyses, child training and parent and nurse behaviors were entered as predictor variables. Child training versus no training was dummy coded and entered on the first step, and parent and nurse coping- and distress-promoting codes were entered simultaneously on the second step.

In the first analysis, child coping ($M = 2.76$, $SD = 1.09$) was entered as the criterion variable. Results indicated that child training accounted for less than 1% of the variance in observed coping, $F(1, 59) = 0.62$, $p > .10$. Parent and nurse coping promoting and distress promoting, however, added significantly to the prediction model, accounting for an additional 40% of the variance in child coping, $F(4, 55) = 7.79$, $p < .001$. Specifically, nurse coping promoting ($M = 3.14$, $SD = .96$) and distress promoting ($M = 1.05$, $SD = .22$) emerged as the strongest predictors, and parent coping and distress promoting did not make a unique contribution (Table I).

In the second analysis, child distress ($M = 1.75$, $SD = 1.09$) was entered as the criterion variable. Once again, child training failed to predict child behavior, accounting for less than 1% of the variance in behavioral distress, $F(1, 59) = 0.69$, $p > .10$. After controlling for child training, parent and nurse behavior accounted for an additional 25% of the variance in child behavioral distress, $F(4,55) = 4.67$, $p < .01$. Parent distress promoting ($M = 1.89$, $SD = .78$) and coping promoting ($M = 2.21$, $SD = .95$) emerged as the strongest predictors, and the relation between nurse and child behavioral distress approached significance (Table II).

Predictions of Child-Reported Pain, Distress, and Fearfulness. Three regression analyses were conducted, with the predictor variables entered in the same sequence as indicated above. The criterion variables were children's ratings of postinjection (1) pain ($M = 2.89$, $SD = 1.62$), (2) distress ($M = 2.49$, $SD = 1.58$), and (3) fear of future shots ($M = 2.72$, $SD = 1.71$). In the first and second analyses, child training and parent and nurse behavior did not predict children's ratings of pain or distress. Results of bivariate correlations, however, indicated significant positive associations between parent distress-promoting behavior

Table I. Summary of Hierarchical Regression Analysis for Variables Predicting Child Coping Behavior During a Routine Immunization

Variable	*df*	ΔR^2	B	SE B	β	*t*
Step 1						
Child training	1, 59	.01	.21	.23	.01	.94
Step 2						
Parent CP	4, 55	.40**	.09	.13	.08	.73
Parent DP		–.11	.16	–.08	–.73	
Nurse CP			.63	.13	.56	4.93**
Nurse DP			–1.25	.52	–.25	–2.40*

B = unstandardized beta, CP = coping promoting, DP = distress promoting.
*$p < .05$.
**$p < .01$.

Table II. Summary of Hierarchical Regression Analysis for Variables Predicting Child Distress Behavior During a Routine Immunization

Variable	*df*	ΔR^2	B	SE B	β	*t*
Step 1						
Child training	1, 59	.01	–.29	.25	–.13	–1.12
Step 2						
Parent CP	4, 55	.25***	.31	.15	.27	2.11**
Parent DP			.42	.18	.30	2.42***
Nurse CP			–.26	.14	–.23	–1.85*
Nurse DP			1.14	.58	.23	1.95*

B = unstandardized beta, CP = coping promoting, DP = distress promoting.
*$p < .07$.
**$p < .05$.
***$p < .01$.

Table III. Summary of Hierarchical Regression Analysis for Variables Predicting Children's Fear of Future Shots

Variable	*df*	ΔR^2	B	SE B	β	*t*
Step 1						
Child training	1, 59	.01	–.37	.41	–.11	–.92
Step 2						
Parent CP	4, 55	.23**	.37	.24	.21	1.58
Parent DP			.56	.28	.26	1.99*
Nurse CP			.26	.23	.15	1.14
Nurse DP			.96	.94	.12	1.03

B = unstandardized beta, CP = coping promoting, DP = distress promoting.
*$p < .05$.
**$p < .01$.

and child ratings of pain ($r[61] = .35$, $p < .05$) and distress ($r[61] = .28$, $p < .05$).

In the third analysis, child training did not contribute significantly to the prediction model; however, parent and nurse behavior made a significant contribution, accounting for 23% of the variance in children's fear of future shots ratings, $F(4, 55) = 3.26$, $p = .01$. Parent distress promoting emerged as the strongest predictor (Table III).

Predictions of Parent and Nurse Reports of Child Distress. Two regression analyses were conducted, with the same predictors and entry order as described. In the first analysis, parent rating of child postinjection distress ($M = 35.39$, $SD = 28.12$) was entered as the criterion variable. Child training did not make a significant contribution; however, parent and nurse behavior accounted for an additional 22% of the variance in parent ratings of child distress, $F[4, 55] = 3.41$, $p < .01$. Parent coping and nurse distress promoting emerged as the strongest predictors of parental ratings (Table IV). In the second analysis, nurse rating of children's postinjection distress ($M =$

Table IV. Summary of Hierarchical Regression Analysis for Variables Predicting Parent Ratings of Child Postinjection Distress

Variable	*df*	ΔR^2	B	SE B	β	*t*
Step 1						
Child training	1, 59	.01	–7.15	6.11	–.12	–1.08
Step 2						
Parent CP	4, 55	.22**	8.92	3.80	.30	2.35*
Parent DP			4.80	4.56	.13	1.05
Nurse CP			–.84	3.71	–.03	–.22
Nurse DP			38.87	15.18	.30	2.56**

CP = coping promoting, DP = distress promoting.
*$p < .05$.
**$p < .01$.

31.56, *SD* = 30.25) was the criterion variable. Child training and parent and nurse behavior did not contribute significantly to the prediction model.

Discussion

This intervention study provides preliminary evidence that training children in coping skills, without the inclusion of adult coaches, might be insufficient. Although the children demonstrated that they had learned the coping skills just before the procedure, this training did not translate into increased coping or decreased procedural distress on any of the outcome measures. There are several ways to interpret this null finding. First, the children simply might have selected to do as the parents or nurse instructed them to do, rather than engage in the coping that they had learned. In fact, after the children left the treatment room, many of them reported to the researchers that they attempted to implement the skills, but the nurse repeatedly encouraged them to engage in other coping (e.g., counting backwards from 10 aloud). Thus, the children might have performed the skills had they been permitted to do so. The young age of the children might have contributed to their assuming a more compliant style with the nurse. Future studies that involve specific roles for parents and nurses and include children of a wide age ranges are warranted to resolve these issues. It is also possible that the children used the skills, but this did not result in changes in coded, rated, or self-reported distress. If this were so, it would stand in contrast to prior studies that have demonstrated positive results with training children in coping skills (e.g., Blount et al., 1992; Cohen et al., 1997; Jay et al., 1985). Notably, however, those prior studies also incorporated adult coaches to assist the children. Last, it is possible that although the brief intervention used is clinically practical and the children demonstrated proficiency at using the skills prior to the procedure, the training was not sufficiently extensive. Possibly, repeated role-playing prior to the procedure and reinforcement for using the skills during the procedure might have increased children's independent coping.

Although neither the parents nor the nurses were trained to coach, they engaged in some behaviors that were related to children's behavior. Consistent with a prior study using the CAMPIS-SF (Blount et al., 2001), nurse coping promoting was positively associated with child coping and nurse distress promoting behavior with child distress. Further, parent distress promoting was positively correlated with child distress. These findings provide further support for the utility of the CAMPIS-SF scale and the notion that some adult behaviors might be beneficial, whereas others might be detrimental. However, this should be interpreted tentatively, given that these are correlational results. In fact, it is plausible that parents and nurses *react* to child distress in certain ways and *react* to child coping in other ways. In addition, these relations might be influenced by other factors, such as child temperament (e.g., Chen, Craske, Katz, Schwartz, & Zeltzer, 2000), child coping (e.g., Fanurik, Zeltzer, Roberts, & Blount), and expectations and memories of procedural distress (Chen, Zeltzer, Craske, & Katz, 2000; Cohen et al., 2001).

Of note, some of our results contradict prior work with the CAMPIS scales. Specifically, parent coping promoting was positively associated with both child distress and child report of fear of future injections. In addition, nurse coping promoting was linked to children's reported fear of future injections. Given the earlier caution of interpreting correlational findings, it might be that these results reflect adults' reactions to children's distress, especially given that these were untrained parents and nurses. If so, it

would suggest that the CAMPIS coping-promoting and distress-promoting code names are misnomers. In support of the term coping promoting, there are a number of experimental studies indicating a causative role for parents' distraction (e.g., Cohen et al., 1999), one of the subcodes included in the coping-promoting category. There is also preliminary evidence that reassurance, a subcode in the distress-promoting category, does in fact cause distress behavior in some children (Manimala, Blount, & Cohen, 2000). Another interpretation is that there is a bidirectional relation between these adult and child behaviors. For example, a nurse might initiate distraction, resulting in decreased child distress (i.e., nurse distraction causes decreased child distress), and then when the child appears distressed, the nurse might react with distraction (i.e., child distress causes increased nurse distraction).

Another explanation is that these adult behaviors influence children in different ways; one of the coping-promoting behaviors might predict heightened coping in some samples, and it might relate to heightened distress in others. As an example, parents' reassurance, one of the CAMPIS distress-promoting subcodes, might lead to decreased crying in some children and increased crying in others. Thus, the blanket use of the terms distress promoting and coping promoting could be inaccurate for certain populations. Thus, we encourage researchers to examine the *function* of discrete behaviors for each individual, or sample of individuals.

In addition to the coping skills intervention evaluation and the independent evaluation of adult behavior, we compared parent and nurse coaching. Consistent with Frank et al. (1995), results indicated that nurses' behavior was more predictive than parents' behavior of child coping, whereas parents' behavior was related primarily to child distress. One explanation is that children more easily engage in distraction and other coping behaviors with a novel person, especially when this person is the authority figure in the situation. Further, the nurse would likely gain more perceived status in the child's eyes if the child's parents appear to comply with the nurse's commands (e.g., instructing the parents how to sit and hold the child). In addition, as part of their schooling and through practical experience, nurses learn techniques to assist medically distressed children. As for the results related to parent behavior, parents are generally anxious during their child's painful procedures, which might interfere with effective coaching. In addition, research indicates that very minimal instruction leads to parents effectively reducing their own anxiety and serving as excellent coaches for their children (e.g., Cohen et al., 1997).

Regardless of the reasons for the findings, there are important clinical implications. For example, nurses may be more efficient than parents at helping children cope. Thus, the nurse might be encouraged to lead the coping and allow the parent to comfort the distressed child, which might clarify the adults' roles. Given the potentially positive impact that nurses have on children's coping, nurse training in effective behaviors is especially important. In terms of parent behavior, we caution readers to not construe the findings to suggest that parents should wait outside the treatment room during their child's procedure to best help the child. Although this might be a logical conclusion, it is not in the best interest of the family and is not consistent with a family-centered approach to health care. First, it essential to consider child and parent preferences about parental presence (Shaw & Routh, 1982; von Baeyer, 1997), and, second, research has demonstrated that with guidance, parents can be excellent coaches (for a review, see Powers, 1999). On a larger scale, we advocate the involvement of the "triad" of patient, family, and staff to most effectively target pain; we expect that an inclusive multidisciplinary perspective will prove optimal for procedural pain and other pediatric issues (Kazak & Kunin-Batson, 2001).

Although these preschool-age children learned the coping skills, they did not perform them during the immunization procedure. However, future studies should continue to examine this avenue of procedural intervention, especially given the dearth of research evaluating children's independent use of coping skills and the possibility that children might generalize the skills to other stressful situations where adults might not be present (e.g., scraped knee on the playground). In addition, this study had some limitations that could be corrected. For instance, the nurses and parents were unaware that the children had learned coping skills. Perhaps these adults initiated their own coaching strategies, which interfered with children's ability to perform the newly acquired skills. Our findings might have been different if parents and nurses had allowed and encouraged children to engage in the learned coping. Additionally, although deep breathing and positive self-statements have empirical support, a number of other skills (e.g., progressive muscle relaxation, imagery) might prove effective. In terms of adult behavior, additional experimental studies are needed

to clarify the specific behaviors that cause child coping and distress. Last, we encourage researchers and clinicians to reframe pediatric procedures as more than simply distressing events for children to endure; medical procedures provide a unique, controlled, and safe environment in which children can learn and practice coping, and in which nurses and parents can hone their coaching skills, with an acute and difficult stressor.

Acknowledgments

We thank Dianne Waldemarson, MEd, RN; Sonja Schriever, RN; and the rest of the staff and patients of the North Central District Health Department.

Received November 16, 2001; revisions received April 1, 2002; accepted May 7, 2002

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 292–325.

Blount, R. L., Bachanas, P. J., Powers, S. W., Cotter, M. W., Franklin, A., Chaplin, W., Mayfield, J., Henderson, M., & Blount, S. D. (1992). Training children to cope and parents to coach them during routine immunizations: Effects on child, parent, and staff behaviors. *Behavior Therapy, 23,* 689–705.

Blount, R. L., Bunke, V. V., Cohen, L. L., & Forbes, C. J. (2001). The child-adult medical procedure interaction scale-short form (CAMPIS-SF): Validation of a rating scale for children's and adults' behavior during painful medical procedures. *Journal of Pain and Symptom Management, 22,* 591–599.

Blount, R. L., Cohen, L. L., Frank, N. C., Bachanas, P. J., Smith, A. J., Manimala, M. R., & Pate, J. T. (1997). The child-adult medical procedure interaction scale-revised: An assessment of validity. *Journal of Pediatric Psychology, 22,* 73–88.

Blount, R. L., Powers, S. W., Cotter, M. W., Swan, S., & Free, K. (1994). Making the system work: Training pediatric oncology patients to cope with their parents to coach them during BMA/LP procedures. *Behavior Modification, 18,* 6–31.

Blount, R. L., Sturges, S. W., & Powers, S. W. (1990). Analysis of child and adult behavioral variations by phase of medical procedure. *Behavior Therapy, 21,* 33–48.

Brophy, C. J., & Erickson, M. T. (1990). Children's self-statements and adjustment to elective outpatient surgery. *Developmental and Behavioral Pediatrics, 11,* 13–16.

Chen, E., Craske, M. G., Katz, E. R., Schwartz, E., & Zeltzer, L. K. (2000). Pain-sensitive temperament: Does it predict procedural distress and response to psychological treatment among children with cancer? *Journal of Pediatric Psychology, 25,* 269–278.

Chen, E., Zeltzer, L. K., Craske, M. G., & Katz, E. R. (2000). Children's memories for painful cancer treatment procedures: Implications for distress. *Child Development, 71,* 933–947.

Cohen, L. L., Blount, R. L., Cohen, R. J., McClellan, C. B., Bernard, R. S., & Ball, C. M. (2001). Children's expectations and memories of acute distress: The short- and long-term efficacy of pain management interventions. *Journal of Pediatric Psychology, 26,* 367–374.

Cohen, L. L., Blount, R. L., Cohen, R. J., Schaen, E. R., & Zaff, J. (1999). Comparative study of distraction versus topical anesthesia for pediatric pain management during immunizations. *Health Psychology, 18,* 591–598.

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

Dahlquist, L. M., Gil, K. M., Armstrong, D., DeLawyer, D. D., Greene, P., & Wuori, D. (1986). Preparing children for medical examinations: The importance of previous medical experience. *Health Psychology, 5,* 249–259.

Donaldson, D., Prinstein, M. J., Danovsky, M., & Spirito, A. (2000). Pattern's of children's coping with life stress: Implications for clinicians. *American Journal of Orthopsychology, 70,* 351–359.

Fanurik, D., Zeltzer, L. K., Roberts, M. C., & Blount, R. L. (1993). The relationship between children's coping styles and psychological interventions for cold pressor pain. *Pain, 53,* 213–222.

Frank, N. C., Blount, R. L., Smith, A. J., Manimala, M. R., & Martin, J. K. (1995). Parent and staff behavior, previous child medical experience, and maternal anxiety as they relate to child procedural distress and coping. *Journal of Pediatric Psychology, 20,* 277–289.

Jay, S. M., Elliot, C. H., Katz, E., & Siegel, S. E. (1987). Cognitive-behavioral and pharmacologic interventions for children's distress during painful medical procedures. *Journal of Consulting and Clinical Psychology, 55,* 860–865.

Jay, S. M., Elliot, C. H., Ozolins, M., Olson, R. A., & Pruitt, S. D. (1985). Behavioral management of children's distress during painful medical procedures. *Behavioral Research and Therapy, 23,* 513–520.

Jay, S. M., Ozolins, M., Elliot, C. H., & Caldwell, S. (1983). Assessment of children's distress during painful medical procedures. *Health Psychology, 2,* 133–147.

Kazak, A. E., & Kunin-Batson, A. (2001). Psychological and

integrative interventions in pediatric procedure pain. In G. A. Finley & P. J. McGrath (Eds.), *Acute and procedure pain in infants and children: Vol. 20. Progress in pain research and management* (pp. 77–100). Seattle: IASP Press.

Kazak, A. E., Penati, B., Boyer, B. A., Himelstein, B., Brophy, P., Waibel, M. K., Blackall, G. F., Daller, R., & Johnson, K. (1996). A randomized controlled prospective outcome study of a psychological and pharmacological intervention protocol for procedural distress in pediatric leukemia. *Journal of Pediatric Psychology, 21,* 615–631.

Kazak, A. E., Penati, B., Waibel, M. K., & Blackall, G. (1996). The perception of procedures questionnaire: Psychometric properties of a brief parent report measure of procedural distress. *Journal of Pediatric Psychology, 21,* 195–207.

Manimala, M., Blount, R. L., & Cohen, L. L. (2000). The Influence of parental reassurance and distraction on children's reactions to an aversive medical procedure. *Children's Health Care, 29,* 161–177.

Manne, S. L., Redd, W. H., Jacobsen, P. B., Gorfinkle, K., Schorr, O., & Rapkin, B. (1990). Behavioral intervention to reduce child and parent distress during venipuncture. *Journal of Consulting and Clinical Psychology, 58,* 565–572.

Melamed, B. G., & Siegel, L. J. (1975). Reduction of anxiety in children facing hospitalization and surgery by use of filmed modeling. *Journal of Consulting and Clinical Psychology, 43,* 511–521.

Powers, S. W. (1999). Empirically supported treatments in pediatric psychology: Procedure-related pain. *Journal of Pediatric Psychology, 24,* 131–145.

Shaw, E. G., & Routh, D. K. (1982). Effects of mothers' presence on children's reactions to aversive procedures. *Journal of Pediatric Psychology, 7,* 33–42.

Sweet, S. D., & McGrath, P. J. (1998). Relative importance of mothers' versus medical staffs' behavior in the prediction of infant immunization pain behavior. *Journal of Pediatric Psychology, 23,* 249–256.

von Baeyer, C. L. (1997). Commentary: Presence of parents during painful procedures. *Pediatric Pain Letter, 1,* 56–59.