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Original Article

The Effects of Two Methods on Venipuncture Pain in Children: Procedural Restraint and Cognitive-Behavioral Intervention Package

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ABSTRACT

Background: Invasive interventions can produce fear, anxiety, and pain in children. This may negatively affect the children's treatment and care.
Aim: This study was conducted to determine the effects of procedural restraint (PR) and cognitive-behavioral intervention package (CBIP) on venipuncture pain in children between 6-12 years of age.
Design: Quasi-experimental study.
Settings: The study was conducted in the pediatric blood collection service of the hospital in Turkey between October 1, 2015, and April 1, 2016.
Participants/Subjects: The population of the study consisted of children admitted to the blood collection service during the study period who met the inclusion criteria.
Methods: The children included in the study were divided into two groups. Group 1 (n = 31) received PR in accordance with routine clinical practice. Group 2 (n = 30) received the CBIP. The data were collected by the researchers using a questionnaire, the visual analog scale (VAS), and the Wong-Baker FACES (WB-FACES) Pain Rating Scale.
Results: The children in the PR group had a mean VAS score of 5.90 ± 3.22 and a mean WB-FACES score of 8.70 ± 2.22. The children in the CBIP group had a mean VAS score of 2.43 ± 2.02 and a mean WB-FACES score of 2.80 ± 2.49. A statistically significant difference was found between the mean VAS and WB-FACES pain scores of the groups ($p < .05$).
Conclusions: The results of this study showed that the children in the CBIP group had a lower pain level during venipuncture compared to those restrained for the procedure.
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Invasive interventions can produce fear, anxiety, and pain in children. Children and parents may be reluctant to undergo a medical intervention. This may negatively affect the children's treatment and care (Blount, Piira, Cohen, & Cheng, 2006; Uman et al., 2013). Negative experiences related to medical procedures have a long-lasting effect on children, which may persist throughout their life (Taddio et al., 2015). Every child has the right to be protected from harm (Bruce, 2009). Relieving or preventing pain is one of the primary responsibilities of nurses providing care for children. In the case of failure to manage acute pain in children, many negative outcomes may occur in the long term. Healthcare professionals often pay little attention to the management of pain associated with venipuncture and intravenous cannulation, which are widely used interventions. However, increasing evidence exists to indicate that a venous access procedure is a significant source of pediatric pain, which must be managed proactively. Nurses should thus focus on the effects of different techniques used or recommended for use in painful medical procedures on children (Aydin, Şahiner, & Çiftçi, 2016; Canbulat, Inal, & Sönmezer, 2014; Czarnecki et al., 2011).

The purpose of procedural pain management is to minimize the pain, anxiety, and fear related to medical procedures. Pharmacological and nonpharmacological methods can be used in combination, as well as alone (Bruce, 2009). Many pain management techniques exist to ensure the safety and comfort of patients during painful procedural interventions. One of these techniques is

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cognitive-behavioral intervention. Existing literature recommends the use of cognitive-behavioral interventions to minimize the distress and pain children experience during interventions (Chen, Joseph, & Zeltzer, 2000; Hockenberry, Wilson, Winkelstein, & Kline, 2003; Jay, Elliott, Katz, & Siegel, 1987). A cognitive intervention is defined as one in which the patient identifies anxiety and negative thoughts related to medical procedures and replaces them with more positive beliefs and attitudes, improving adaptive behavior and coping methods (Barlow & Durand, 2015). The cognitive interventions used for procedures include cognitive distraction, imagery, hypnosis, preparation/information, thought-stopping, coping self-statements, suggestion, memory change, and parent training (Uman, Chambers, McGrath, & Kisely, 2008). A behavioral intervention is defined as an intervention to reveal specific behaviors based on behavioral sciences and learning principles (Barlow & Durand, 2015). They include behavioral distraction, muscle relaxation, breathing exercises, modeling, rehearsal, desensitization, positive reinforcement, parent training, parent/staff coaching, and virtual reality. Cognitive-behavioral interventions can be defined as packages that contain a minimum of one behavioral intervention together with a minimum of one cognitive intervention (Uman, Chambers, McGrath, & Kisely, 2008).

Cognitive-behavioral interventions teach effective coping skills to reduce the stress and anxiety children experience during painful procedures (Ellis & Spanos, 1994; Jay, Elliott, Fitzgibbons, Woody, & Siegel, 1995). In a study using the cognitive-behavioral intervention package (CBIP) to reduce children's distress during a painful medical procedure, the children in the treatment group had a lower score for distress and pain than children in the control group (Jay, Elliott, Katz, & Siegel, 1987). In their study, Sikorova and Hrazdilova (2011) implemented a psychological consultation comprised of cognitive and behavioral interventions on children in the 5- to 10-year age group during venipuncture. In the study, they found that the pain levels of the consultation group were lower than the control group.

In the present study, the CBIP included preparation and information regarding the procedure as well as cognitive-behavioral distraction, suggestions (procedure will be less painful, and procedure will not damage to your arm, etc.), parent training, and positive reinforcement. Information was provided about what might be experienced during the procedure (Zeltzer, Jay, & Fisher, 1989). The American Academy of Pediatrics (2001) states that information about medical procedures must be provided to children and parents so they can be prepared for the procedure. A related review study concluded that pediatric patients were not prepared adequately for acute medical procedures (Jaaniste, Hayes, & von Bayer, 2007). Harrison (1991) studied a convenience sample of 100 children, aged 6-12 years; children who had been prepared for the venous blood withdrawal procedure found it less painful that those who had not.

Distraction is usually defined as a strategy (whether cognitive or behavioral) that draws a child's attention away from detrimental pain stimuli (Sander, Eshelman, Steele, & Guzzetta, 2002). Kleiber and Harper (1999) reviewed the effect of distraction on the distress patterns of children (16 studies) and the children's self-reported pain (10 studies) during medical procedures. The results of the study revealed that distraction reduced children's self-reported pain in various medical procedures. In a systematic review, it was reported that distraction methods reduced both needle-induced pain and distress in children and adolescents (Birnie, Noel, Chambers, Uman, & Parker, 2018).

One suggestion researchers have made is that positive verbal and nonverbal feedback be given to the child by the nurse (Emergency Nurses Association [ENA], 2018). In their systematic review, Uman, Chambers, McGrath, and Kisely (2008) examined studies using the suggestion method alone. They found that the method did not reduce self-reported and observed pain or distress levels in children. On the other hand, the same study reported that when the suggestion method was used with distraction in needle-related painful procedures, the children's self-reported pain was reduced.

Cognitive and behavioral interventions aim to teach parents how to alleviate their children's distress during needle-related procedures (McCarthy et al., 2010). In this study, parents were trained in how to soothe and support their children by holding their hands. The Agency for Health Care Policy and Research and the Public Health Service (1992) jointly recommend that parents be present with their children during medical procedures. Studies have found that the presence of parents during medical procedures reduces both distress and pain for their children (Bauchner, Vinci, Bak, Pearson, & Corwin, 1996; Cavender, Goff, Hollon, & Guzzetta, 2004).

Examples of positive reinforcement include positive statements and tangible rewards (e.g., toys) after painful procedures (Uman, Chambers, McGrath, & Kisely, 2008). The reinforcement encourages the child's coping behaviors during the painful procedure and increases the likelihood of them showing similar behaviors in identical conditions in the future (Schiff, Holtz, Peterson, & Rakusan, 2001). In their study, Manne et al. (1990) implemented a behavioral intervention package of parent coaching, distraction, and positive reinforcement for children with cancer during venipuncture intervention, whereby they determined that the intervention reduced the children's behavioral distress. In another study, researchers implemented a package involving preparation, relaxation, distraction, reinforcement, parent involvement, and eutectic mixture of local anesthetics cream on children infected with HIV during venipuncture. In this study, a significant reduction in the children's pain and distress levels was found (Schiff, Holtz, Peterson, & Rakusan, 2001).

Procedural restraint (PR) is the most common approach used to ensure patient safety and improve treatment success during invasive interventions (Brenner, 2007; Kennedy & Mohr, 2001; Tomlinson, 2004). The Joint Commission on Accreditation of Healthcare Organizations defines PR as “using physical force directly on the patient to restrict freedom of movement without consent of the patient” (American Nurses Association [ANA], 2012, p. 3-4). PR is widely used for painful procedural interventions in pediatric patients, often for inserting or removing a drain or intravenous cannula or injecting drugs when initiating and ending treatment in children. However, it has adverse physical effects on patients, and may cause fear, anger, anxiety, agitation, resistance, resistance to procedures, and bad temper (Crock et al., 2003; Ofoegbu & Playfor, 2005; Stacey, Ames, & Petros, 2000).

No study was found in the literature comparing the effects of PR and behavioral-cognitive interventions on children's pain levels during venipuncture. Thus the present study investigated the effects of PR, which is not a pain management strategy, and CBIP, which is a pain management strategy (including preparation and information, cognitive-behavioral distraction, suggestion, parent training, and positive reinforcement), on children's pain levels during venipuncture.

Research Hypotheses

H_0: There is no difference between the pain scores of children receiving PR and the pain scores of children receiving CBIP.

H_1: There are differences between the pain scores of children receiving PR and the pain score of children receiving CBIP.

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Materials and Methods

This is a quasi-experimental study with a treatment group and a control group; it was conducted in the pediatric blood collection service of a maternity and children's hospital located in western Turkey between October 1, 2015 and April 1, 2016. The study participants consisted of children between 6 and 12 years of age who were admitted to the blood collection service during the study period and who met the inclusion criteria. The sample size was determined by a power analysis, which had a 98% test power with an effect size of 1.29 at a confidence interval of 95% and a significance level of .05 for the analysis *t* test. The sample included a total of 61 children, 31 in the PR group and 30 in the CBIP group.

The inclusion criteria for the current study required that participants be 6 to 12 years of age, not have any chronic diseases, congenital or neurological disorders, not have been previously hospitalized for treatment, and have no history of using sedatives, analgesics, or narcotic substances or drugs, and that their parents gave consent to their inclusion in the study. After data collection began, seven children in the PR group and five children in the CBIP group were dropped from the sample. Figure 1 shows the study flow diagram for child enrollment. The sample group for the study consisted of 61 children selected from the study population using a random sampling method. The children were assigned to a sample group based on day of admission. Groups were assigned to even or odd days, which were decided by drawing lots.

Data Collection

The data were collected by the investigators through face-to-face interviews using a questionnaire, visual analog scale (VAS) and the Wong-Baker FACES (WB-FACES) Pain Rating Scale.

Questionnaire

The questionnaire developed by the investigators contained identification questions, such as age and gender of the child, and questions about their prior experience of invasive interventions, intravenous (IV) access, and fears about IV intervention.

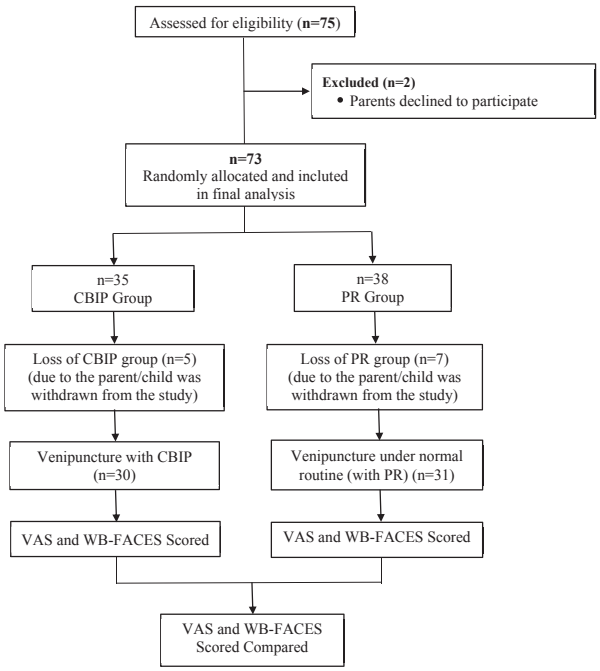


Figure 1. Flow of study.

VAS

The scale is used to measure and monitor the severity of pain. It is a 10-centimeter horizontal or vertical line with a statement at each end. The left end of the line states “no pain” or “no pain at all,” and the right end of the line states “unbearable pain” or “worst possible pain.” The child is instructed to mark a point on the line that would accurately represent their pain. The distance of the patient's mark to the left end is measured in centimeters and expressed as the score. The VAS has been used successfully in school-aged children (Wewers & Lowe, 1990).

WB-FACES Pain Rating Scale

The scale was developed by Wong and Baker in 1981 and restructured in 1983. The scale is used to describe pain in children between 3-18 years of age and includes drawings of six faces that represent gradually increasing severity of pain, with pain levels rated from 0 to 5. The leftmost face is a smiley face that represents “no pain,” and the rightmost face is a crying face that represents the “most severe pain.” The child is instructed to choose a face that best expresses how he or she is feeling. The WB-FACES scale is a 0-10 scale, with higher scores indicating less tolerable pain (Mayer, Torma, Byock, & Norris, 2001; Wong & Baker, 1988).

CBIP

Researchers used existing literature to configure the CBIP, taking into account children's developmental characteristics. The opinions of the researchers, three professors specializing in the fields of pediatric or psychiatric nursing, were then applied, shaping the CBIP into its final form. One of the three researchers, who is also a nurse with a Ph.D. in the pediatric nursing field with 12 years of clinical experience, implemented the CBIP with the participants. A pilot study on the CBIP was conducted on five children. The study was recorded on video and later submitted for the expert opinion of the team, including professors. Based on these expert opinions, the CBIP took its final form. The children included in the pilot study were not included in the analysis of the study.

The cognitive interventions in this package include preparation and information regarding the procedure, cognitive distraction, suggestions (procedure will be less painful, etc.), and parent training. The behavioral interventions include positive reinforcement and behavioral distraction.

- Preparation and information on the procedure: The investigator conducted an interview with the child and parents prior to the procedure. This interview was intended to provide information (appropriate for the child's age) on how the procedure was performed, how long it would take, and how the child should behave. The investigator then answered any questions the child might have.
- Cognitive distraction: After the child was informed about the procedure, the investigator asked the child questions not related to the procedure while it was in progress to draw the child's attention to another subject.
- Suggestions: The investigator used verbal and nonverbal communication techniques (eye contact, speaking a calm tone of voice, etc.) and made suggestions before starting the procedure to make the child feel they were supported (suggesting that the procedure will be less painful, and procedure will not damage to your arm, etc).
- Parent training: The investigator included the parents in the preparation and information interview prior to the procedure

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and instructed them to provide support to the child (standing with the child, holding his or her hand, etc.).
- Behavioral distraction: The investigator suggested various distraction techniques for the child during the procedure (e.g., counting, singing a song, reading a poem, or answering questions). The technique chosen by the child was used during the procedure.
- Positive reinforcement: After the procedure, the investigator encouraged the child with positive feedback (positive reinforcement) about the child's successful coping ability during the procedure ("Well done!" "You were very brave!" etc.).

Intervention

For the pediatric blood collection procedure, a volunteer nurse with a minimum of 5 years of experience performed the venipuncture. The nurse did not have any conflict of interest. The clinical decision to perform venipuncture was made by a pediatrician. The venipuncture was performed in accordance with the procedures of the blood collection service using a 22-gauge needle with a phlebotomy seat specifically prepared for children. No pharmacological pain relief method was administered before, during, or after the venipuncture. The post-procedure pain of each child was assessed by VAS and WB-FACES.

PR Group ($n = 31$)

The children in this group were restrained during the venipuncture procedure in accordance with the routine practice of the blood collection service. The younger children sat on their parent's lap while the parent restricted the child's movements. The parent placed the child's leg between their legs to constrict them. The other (nonvenipuncture) arm was held by the parent to restrict movement. The older children sat on the seat, and their arms, and legs when needed, were restrained by the parent or auxiliary staff. The blood was collected by the nurse. After the procedure, the children assessed the pain experienced during the procedure using VAS and WB-FACES. The process for the PR group lasted approximately 5-7 minutes.

CBIP Group ($n = 30$)

All the stages of CBIP were used by the investigator for the children and parents in this group. The pre-procedure interview with children for preparation and information about the procedure was carried out in a room next to the procedure room. After this interview, the child sat on the venipuncture procedure seat alone, with the support of a parent and the investigator. The child was introduced to the investigator prior to the procedure. The nurse answered any questions the child might have. The parent sat on the seat next to the child and held his or her hand for support. The blood was collected by the nurse when the child indicated he or she was ready for the procedure. During the procedure, the investigator used the stages of CBIP (cognitive distraction, suggestions, behavioral distraction, and positive reinforcement). The children assessed the pain they experienced during the procedure using VAS and WB-FACES. The process of the CBIP group lasted approximately 10-15 min.

Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences software program (SPSS Inc., Chicago, IL, USA) for Windows (version 18.0). Descriptive statistics were expressed as percentage, mean, and standard deviation. The PR group and CBIP group were compared using the χ^2 test and independent t test. Significance was assessed at the level of $p < .05$.

Ethical Considerations

Before conducting this study, we obtained approval from the ethical committee of the Medical School of Çanakkale Onsekiz Mart University (dated December 21, 2015, number 2015/17-02), and obtained official permission from the other relevant authorities. The purpose of the study was explained to all the parents of the children included in the study, who then returned an informed-consent form to participate. Additionally, the children were provided with information on the study to obtain their verbal consent.

Results

The mean age of children in the PR group was 8.32 ± 2.07 years, and the mean age of children in the CBIP group was 8.37 ± 1.77 years. Of the children in the PR group, 87.1% had prior experience with venipuncture, compared to 90% of children in the CBIP group. Of the children receiving PR, 44.4% had previously experienced venipuncture once, compared to 51.9% of children receiving CBIP. The children in the PR and CBIP groups were compared for variables including age, gender, experience of IV injection, number of IV injections, and fear of injection. There were no

Table 1
Comparison of Groups According to the Children's Descriptive Characteristics and Venipuncture-related Characteristics

Characteristics	PR Group (n = 31)	CBIP Group (n = 30)	Test	*p*
	n (%)	n (%)		
Age* (y)	8.32 (2.07)	8.37 (1.77)	$t = 0.089$	.929
Gender			$\chi^2 = 0.807$	.369
Female	17 (54.8)	13 (43.3)		
Male	14 (45.2)	17 (56.7)		
Venipuncture experience			$\chi^2 = 0.126$	.722
Yes	27 (87.1)	27 (90.0)		
No	4 (12.9)	3 (10.0)		
Number of venipuncture experiences			$\chi^2 = 0.913$	.634
1	12 (44.4)	14 (51.9)		
2	7 (25.9)	8 (29.6)		
3	8 (29.6)	5 (18.5)		
Fear of venipuncture			$\chi^2 = 1.991$	.158
Yes	18 (58.1)	12 (40.0)		
No	13 (41.9)	18 (60.0)		

PR = procedural restraint; CBIP = cognitive-behavioral intervention package; SD = standard deviation.
* Mean (SD).

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Table 2
Comparison of Mean Pain Scores of Children in the PR and CBIP Groups

Scale	PR Group (n = 31)	CBIP Group (n = 30)	Test	*p*
	Mean (SD)	Mean (SD)		
VAS	5.90 (3.22)	2.43 (2.02)	$t = 5.007$	.000
WB-FACES Pain Rating Scale	8.70 (2.22)	2.80 (2.49)	$t = 9.769$	.000

PR = procedural restraint; CBIP = cognitive-behavioral intervention package; SD = standard deviation; VAS = visual analog scale; WB-FACES = Wong-Baker FACES.

statistically significant differences between the groups ($p > .05$; Table 1).

Table 2 compares the mean of pain scores for children in the PR and CBIP groups. The children who were restrained for the procedure had a mean VAS score of 5.90 ± 3.22, and mean WB-FACES score of 8.70 ± 2.22. The children receiving CBIP had a mean VAS score of 2.43 ± 2.02, and a mean WB-FACES score of 2.80 ± 2.49. There was thus a statistically significant difference between the mean VAS and WB-FACES score for the groups ($p < .05$; Table 2).

Of children receiving CBIP, 23.3% had a VAS score of 0, and 60% had a score of 1-4, whereas 16.1% of restrained children had a score of 5-7 and 41.9% had a score of 8-10. Of children in the CBIP group, 43.3% had a pain level of "hurts a little bit/hurts little more" according to WB-FACES. Of children in the PR group, 64.5% reported a pain level of "hurts worst" (Table 3).

Discussion

The American Society for Pain Management Nursing states that individuals subjected to a painful procedure have the right to have their pain managed in the most appropriate manner before, during, and after the procedure. It also stresses that a plan must be developed to relieve pain and anxiety prior to a painful procedure (Czarnecki et al., 2011). In addition, the American Academy of Pediatrics (AAP, 2001) emphasizes that pain related to medical and nursing procedures in children can be substantially reduced or prevented; pharmacological and nonpharmacological approaches are recommended (Schechter et al., 2007).

It has been reported that during procedural interventions, a child's pain and reaction level is affected by the type of procedure (Rawe et al., 2009) as well as the child's character, experience with pain, and physical, psychological, and social factors (Marsac & Funk, 2008). Studies exist demonstrating that a child's pain level is affected by factors such as gender, experience, and fear of injection (Windich-Biermeier, Sjoberg, Dale, Eshelman, & Guzzetta, 2007), but there are also studies showing pain level is not affected by these factors (Aydin, Şahiner, & Çiftçi, 2016; Canbulat, Inal, & Sönmezer, 2014; Crevatin et al., 2016; Karakaya & Gözen, 2016). The current study compared children by their defining characteristics and found that both groups were similar in terms of these variables ($p > .05$). It is important that groups be similar in terms of variables with the potential to affect a child's perception of pain and reaction level in order to show the effects of the two methods used during the venipuncture procedure.

Table 3
Comparison of PR and CBIP Groups According to the Distribution of Children's Pain Scores

Scale Pain Levels	PR Group (n = 31)	CBIP Group (n = 30)
	n (%)	n (%)
VAS		
0 points	2 (6.5)	7 (23.3)
1-4 points	11 (35.3)	18 (60.0)
5-7 points	5 (16.1)	5 (16.7)
8-10 points	13 (41.9)	- (-)
WB-FACES Pain Rating scale		
No hurt	1 (3.2)	9 (30.0)
Hurts little bit/hurts little more	- (-)	13 (43.3)
Hurts even more/hurts whole lot	10 (32.3)	8 (26.7)
Hurts worst	20 (64.5)	- (-)

PR = procedural restraint; CBIP = cognitive-behavioral intervention package; VAS = visual analog scale; WB-FACES = Wong-Baker FACES.

This study investigated the effect on pain of two methods, PR and CBIP, used with children during venipuncture. The results showed that children restrained for the procedure had a statistically significant higher mean pain score than children in the CBIP group ($p < .05$). This finding corroborates the hypothesis that differences exist between the pain score of children receiving PR and the pain score of children receiving CBIP. No study in the literature compared the effects of PR and behavioral-cognitive interventions on children's pain levels during painful procedures. However, previous studies in the literature suggest alternative practices other than PR (Brenner, 2007; Folkes, 2005; Masters, 1998). The previous studies reported that the use of PR with children was not useful and caused them to experience a high level of stress (Brenner 2007; Martinez, Grimm, & Adamson, 1999; Masters, 1998; Mohr, Mahon, & Noone, 1998). The children reported that they experienced distress more than pain during treatments and medical procedures performed using PR (Folkes, 2005; Robinson & Collier, 1997). PR causes children to feel a loss of control and as if they are being punished, as well as fear, anxiety, and insecurity (Demir, 2007). PR may cause physical and psychological damage to children before, during, and after the procedure (McGrath, Forrester, Fox-Young, & Huff, 2002). If excessive force is used during the PR, children may experience pain, injury, and speech disorders. The potential psychological effects may include emotional distress, poor coping skills, phobia, and difficulty in communicating with healthcare professionals (Brenner, Treacy, Drennan, & Fealy, 2014). The literature demonstrates that the use of cognitive-behavioral interventions in children, such as distraction, play therapists, the use of parents, improved pain relief, and behavioral interventions may result in less physical restriction (Dorfman, 2000; Huff & McGrath, 2003; McCarthy, Cool, & Hanrahan, 1998; Piira, Sugiura, Champion, Donnelly, & Cole, 2005; Tomlinson, 2004; Willock, Richardson, Brazier, Powell, & Mitchell, 2004). Cognitive-behavioral interventions contribute to relaxing children and parents during painful procedures, creating a better understanding of the child's condition and cooperation, and eliminating the need for PR. In the study by Schiff, Holtz, Peterson, and Rakusan (2001), cognitive-behavioral strategies were used for routine venipuncture procedures in HIV-positive children (n = 43), and their effect on procedural pain was examined. The study demonstrated the effectiveness of using a multicomponent pain management intervention comprised of cognitive-behavioral interventions for reducing pain and anxiety in children. The effect of cognitive-behavioral interventions on venipuncture-/IV insertion-related procedural pain in children was examined through randomized controlled studies. Cavender, Goff, Hollon, and Guzzetta (2004) investigated pain, fear, and distress in children in the control

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group and a treatment group using parental positioning and distraction in children aged 4 to 11 years (n = 43). In this study, the treatment group's fear score was lower, but there were no statistical differences between the two groups. Despite this finding, an association between pain and fear was determined. Jay, Elliott, Katz, and Siegel (1987) compared the pain and distress scores of children aged 3 to 13 years using CBIP and a low-risk pharmacological intervention (oral Valium) during painful medical procedures (n = 56). In that study, the children in the CBIP group had a statistically lower score for behavioral distress and pain. Hsieh et al. (2017) examined the effect of a cognitive-behavioral program on pain and fear in children aged 6 to 12 years undergoing intravenous placement (n = 68). Although the children receiving the cognitive-behavioral program had a lower score for pain and fear than the control group, there were no statistically significant differences found between pain scores.

Limitations of the Study

This study had some limitations. First, the study included a small sample group. The results of this study cannot be generalized to all children undergoing venipuncture. It can be generalized only to children included in the study. Second, this study was not double-blind. Due to the nature of cognitive-behavioral interventions, neither the children nor the data collector could be blinded to the interventions (Good, 1996). Pain levels were not assessed by the researchers to correct their bias.

Conclusions

This study compared the effects of PR and CBIP methods on pain when used during venipuncture, a painful procedure performed frequently on children. In present study, the children in the CBIP group had a lower pain score than children in the PR group. Use of cognitive-behavioral therapy and treatment interventions alone or in combination during painful procedures are effective in the management of children's pain, fear, and anxiety. Further studies are recommended, including different combinations of cognitive and behavioral interventions. PR is widely used to ensure children's safety, but results in negative outcomes in children. PR must therefore be regarded as a last resort by healthcare professionals.

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