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Children's experiences of intravenous injection using the draw, write, and tell method: A mixed-methods study

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ABSTRACT

Purposes: This study aimed to explore children's perceptions and experiences of receiving intravenous (IV) injections and the self-reported pain scores and management strategies that can support children while receiving IV injections.

Design and methods: This mixed-methods study included 17 children aged 4–11 years who presented to the outpatient clinic of a pediatric hospital and received IV injections. Data were collected using the draw, write, and tell method (DWT) and Facial Pain Rating Scale. Descriptive statistics and content analyses were performed.

Results: The children's self-reported mean pain score was 4.82, indicating moderate pain. Many expressions indicated that IV injections were painful or caused tingling or stinging sensations. A vague fear of needles in addition to pain was identified after listening to the children and analyzing their own interpretation of drawings. Three main themes were identified: (1) physical and emotional experiences, (2) parents as my secure base, and (3) comfort and relief strategies.

Conclusions: Children expressed their experiences during IV injections, the alleviation of their pain and fear, and their suggestions for comfort and relief strategies visually, auditorily, and verbally. Parents played an important role in supporting their children and reducing pain, anxiety, and distress related to the IV procedure.

Practice implications: The DWT, as an arts-based and child-centered approach, is a useful and valid method to understand children's experience related to the IV injection. Children experience comfort and relief within a family-centered care context during IV injection. Nurses should promote children's and parents' participation in the development of strategies to reduce the negative effects of IV injections in children.

Introduction

Background

Intravenous (IV) injection is a common source of pain, fear, and distress in children's hospitals (Constantin et al., 2022; McMurtry et al., 2015). Unmanaged pain and fear in children are associated with negative behavioral, physical, and psychological consequences (Bice et al., 2018; McMurtry et al., 2015). Therefore, the optimal management of children's pain and fear related to IV injection is important.

However, management of IV injection-related negative effects is challenging in the pediatric setting. Studies examining children's views on IV injection are limited. The pain and distress experienced by children during IV injection have been well documented from the observations of healthcare professionals and parents. Seeking their opinions is important and necessary for pediatric nursing care, but seeking children's opinions is also important as they have the right to participate in their healthcare and their perspectives should be reflected in decisions (Caldairou-Bessette et al., 2020; Davies et al., 2019; Foster et al., 2022). Moreover, the opinions of healthcare professionals and parents may not capture what is meaningful to children and may lead researchers to interpret issues inaccurately (Ali et al., 2022; Angell et al., 2015).

Child-centered care (CCC) has been increasingly adopted globally as a fundamental philosophical approach in pediatric healthcare settings (Coyne et al., 2018; Ford et al., 2018), in which the child is at the center of thinking and healthcare practice, and the child's interests are prioritized. It features children's rights, dignity, voice, competence, and engagement as active agents (Coyne et al., 2018). Children's participation in their healthcare decisions is a key element of CCC (Coyne et al., 2018; Gerlach & Varcoe, 2021). It is essential to involve children in decision-making for the effective administration of and decreased negative effects related to IV injections (Barroso et al., 2020; Kleye et al., 2021). However, children were often not participants in

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previous studies exploring their health experiences (Caldairou-Bessette et al., 2020; Davies et al., 2019).

There is a growing recognition of the contributions that children's perspectives can make to research (Gerlach & Varcoe, 2021; Kleye et al., 2021). Pediatric researchers have become aware of children's capacity to provide important information related to their experiences and interest using participatory research methods (Horgan, 2017; Montreuil et al., 2021). As one such method, drawings provide an opportunity for children to gain a deeper understanding of their experiences, which may be difficult to express through language alone (Foster & Whitehead, 2019; Pope et al., 2019). However, ambiguity and inconsistency in adult researchers' analysis of children's drawings may lead to misinterpretation or loss of the children's perspectives. To compensate for this limitation, the draw, write, and tell method (DWT) was developed (Angell et al., 2015). The DWT enables children to communicate their experiences by drawing, writing, and telling the story depicted in their pictures in response to interview questions. Writing about or explaining their drawings makes it less likely for researchers to misinterpret their meaning (Coyne et al., 2021; Pope et al., 2019).

Several studies have been conducted from the perspective of adults to explore pain, fear, and stress related to IV injections in children (Hedén et al., 2016; Silva et al., 2022); however, there is a lack of research on children's perspective of IV injections and management. Few studies have used the DWT to explore children's pain or IV injection experiences; furthermore, these studies were conducted in Western countries (Bice et al., 2018; Pope et al., 2018); little is known about Korean children's perceptions. Cultural differences may influence children's perceptions, reactions, and responses to pain and distress during IV injections (Bisogni et al., 2014; Mahoney et al., 2010). Moreover, considering children's cultural and social context is an important characteristic of CCC (Coyne et al., 2018).

Aims

This study aimed to explore children's perceptions and experiences of receiving IV injections in a Korean outpatient hospital setting and the self-reported pain scores and management strategies that can support children while receiving IV injections.

Methods

Design

This study used a convergent mixed-methods design combining a survey with a qualitative descriptive study using the DWT. Data collection and analysis of both quantitative and qualitative data were conducted separately and were then compared and integrated (Creswell & Plano Clark, 2018).

Setting and sample

Twenty-one children aged 4–12 years who presented to the pediatric outpatient clinic of a pediatric department in G city were recruited using convenience sampling. The sample size was determined by the completeness of the data; data collection was continued until saturation was reached. Children aged between 4 and 12 years who could understand and speak Korean, had no cognitive deficits, and did not require urgent medical treatment were included. Children who were unable to communicate verbally or children and caregivers who the nurse thought were too distressed or sick to participate were excluded. This age range was chosen based on the ability to use complex sentences, recall and describe events, and as such, be interviewed using simple, non-leading questions (Pope et al., 2018). Children, who were considered by their caregiver to be developed enough, were asked to assess their experiences of IV injections using the DWT.

Measurements

1) Pain

The children's self-reported pain level experienced during IV injections was measured using the Korean translation of the Wong–Baker FACES® Pain Rating Scale (FPRS) (Wong-Baker FACES Foundation., 2018), consisting of six faces showing a spectrum of emotions ranging from a happy face suggesting "no hurt" (0) to a crying face suggesting "hurts worst" (10). This valid and reliable scale is widely used in children aged ≥3 years.

2) Draw, write, and tell method

The children's experiences with IV injections were examined using the DWT. We provided them with A3 sized sketchbooks to accommodate their gross and fine motor skills (Pope et al., 2018) and 12 colored pencils to ensure a sense of control (Carter & Ford, 2013). All pictures were digitally copied and stored.

Data collection

Before drawing, an assistant researcher showed the FPRS to the children and asked them to choose the face that most accurately depicted the pain they experienced during the IV injection. Caregivers completed a demographic questionnaire.

The children's experiences of IV injections were collected using the DWT. Interviews were conducted approximately 15 min after the IV injections to help prevent recall bias. Interviews were conducted in an outpatient injection room. Children were asked to choose whether or not their caregivers were to be present during the interview. All children chose to have a caregiver with them. At the beginning of the interview, the caregivers were politely asked to support or encourage their children in expressing their perspectives, if necessary, but not to force an answer or answer on behalf of their children (O'Reilly & Dogra, 2017).

The interview guiding questions were adapted from previous studies that explored children's experiences of pain (Bice et al., 2018; Pope et al., 2018). The guiding questions of the DWT were as follows.

1) Draw a picture of how you felt when you were receiving IV injections.
2) Are there any words you would like to write about how you felt when you were receiving IV injections (I can help you write)?
3) Tell me about the picture and the words you have written.
4) What helped you when you were receiving IV injections?
5) What did the nurse, you, and your caregiver do when you were receiving IV injections?
6) What do you think the nurse, you, and your caregiver could do to help you when you receive IV injections?

Children's self-reported pain scores were also used to compare and integrate the children's interpretation of the drawing. The interview started with the interviewer asking the children to draw a picture representing their IV injection experience. Interviewers attempted to build rapport with the participants since it might help them feel comfortable sharing their experiences (Angell et al., 2015). As a child-friendly method, drawing itself offered the interviewers an opportunity to build rapport with the children and their caregivers. Once the child had finished drawing, they were praised for drawing, encouraged to disclose their feelings, and offered help using age and developmentally-appropriate explanations (Bryan et al., 2019; Ponizovsky-Bergelson et al., 2019). After drawing, the child was asked to write and talk about their experiences of IV injections by explaining their drawing. The children were allowed to spend as much time as they needed for the DWT process. Most of the drawings were completed within 10 min while the interviews lasted 10 to 20 min.

Pain assessment and interviews were conducted by two research assistants majoring in nursing and trained in the underpinning philosophy and methodology of the DWT, including a qualitative interview with children (Angell et al., 2015; Ponizovsky-Bergelson et al., 2019; Pope et al., 2018). During the data collection, two research assistants met, offline or online, daily with the researcher to discuss any issues or challenges that arose and explore potential solutions. All interviews were audio-recorded, and field notes were taken to capture contextual details and nonverbal interactions observed by the interviewer. Data saturation was reached after the 21st participant. Data were collected between February 2, 2021 and March 24, 2021.

Ethical considerations

Approval was obtained from the institutional review board of the relevant institution before commencing the study (IRB No: 2–1041055-AB-N-01-2020-71). For data collection, a researcher contacted the head of the hospital and the nursing department and explained the purpose of the study. After receiving permission, the two research assistants visited the outpatient injection room. The purpose of the study and considerations for participant confidentiality and anonymity were described to the potential participants. The details of the study were explained and discussed with the caregivers and the participating children. Caregiver's informed written consent and children's assent/consent were obtained prior to the data collection and during the data collection. Initial informed assent/consent from the child was regarded as conditional and the children's willingness to participate was continually revisited by observing their language and behavioral signals (Einarsdottir, 2007; Water et al., 2020) such as their promptness to draw, write, or answer the questions. Moreover, research assistants also reassured children that there was no obligation to participate in the study, that it was okay to say no at any time, and whether or not to participate in the study was their own decision, to minimize the power inequalities between children and adults (Coyne, 2010).

Children were given the choice to keep their drawings, if they wanted, and asked for their consent to scan their drawings. The sketchbook and 12 colored pencils used for the study were given to the children as a token of appreciation for their participation in the study.

Data analysis

The quantitative data were analyzed using SPSS. Descriptive statistics were used to analyze the characteristics of the children and their pain, and a *t*-test or analysis of variance (ANOVA) was used to assess differences in pain according to the children's characteristics.

The qualitative data were analyzed using conventional content analysis as described by Hsieh and Shannon (2005). Interview recordings were transcribed verbatim by the interviewers, immediately after the interviews were conducted. According to the DWT (Angell et al., 2015; Pope et al., 2018), only the children's descriptions of their drawings and transcripts of the interviews were analyzed. Drawings were used to guide inquiry for children's perspectives during the interview to prevent misinterpretations of children's drawings by adults. Each transcript was read line-by-line, and meaningful statements were extracted by the researcher. While repeatedly reading the extracted meaning statements and transcripts, attention was paid to important phrases and keywords, which were categorized, and main and sub-themes were derived. After completing the data collection, the two research assistants were interviewed by the researcher to capture their insights which were synthesized with the understandings and insights from the researcher. The analytical process and results were reviewed by two interviewers and an art psychologist with experience in qualitative research.

Results

1. Participant Characteristics

Twenty-one children completed drawing the pictures, but four (two each of 4 and 5 years) were excluded from the analysis because the writing and "telling" parts of their data were insufficient for analysis. Finally, 17 children were included in this study, with a mean age of 7.64 ± 2.62 years (range: 4–11). No 12-year-old child was recruited. The participants comprised nine girls (52.9%) and eight boys (47.1%). Most children had previous experience with IV injections (88.2%). The primary caregivers of the children were mostly mothers (88.2%), and the most common symptoms were gastrointestinal symptoms (64.6%) (Table 1).

2. Self-Reported Pain

In the majority of the children (88.2%), IV injection was successful in one attempt; two attempts were required only for two children (11.8%). The self-reported mean pain score, assessed using the FPRS after IV injection and before drawing, was 4.82 ± 3.88 (range: 0–10), indicating a moderate pain level.

There was a negative correlation between age and pain score ($r = -.253$, $p = .328$), and girls reported higher pain scores than boys ($t = 1.082$, $p = .296$). Moreover, children who had previous IV injection experience reported slightly higher pain scores than those who did not ($t = -0.066$, $p = .948$), and children who underwent two IV injection attempts reported lower pain scores than those who required only one attempt ($t = 0.697$, $p = .497$). However, none of the differences were statistically significant (Table 1).

3. Draw, Write, and Tell

Fourteen children included themselves, three included nurses, and one included their mother in their drawings. Six children included needle in their drawings, and the most popular color used for drawing was black, followed by yellow. By content analysis, three main themes and eight subthemes emerged from the data. The main themes were physical and emotional experience, parents as my secure base, and comfort and relief (Table 2).

i. Physical and Emotional Experience

Upon asking the children how they felt when they received an IV injection, they were able to express detailed feelings and represent their pain through drawings. The first theme was named "physical and emotional experience" and included three subthemes: "pain," "fear," and "happy and good."

a. Pain

Words used to describe pain included "it hurt," "it was stinging," "it felt like a pinch," "it was very painful," and "it was not painful, but I was scared."

An 8-year-old girl who described her experience as being "very painful" indicated her pain level on the FPRS by selecting the face that resembled hers, with a sad expression and tears dripping (10 points), denoting the worst pain (Fig. 1).

An 11-year-old boy explained his IV injection experience as "it hurt, it stung badly," and on the FPRS, he selected a face with a 6-points indicating severe pain. He drew a picture of blood dripping. "I drew a picture of when I cut myself, on the piece of paper. I drew it because it felt like when I cut myself." He explained his drawing as follows: "The black color is the flesh of my arm, the pink color is my blood, and the white in the middle is my bone." He expressed the experience of IV injection as "tearing of the flesh, the bones being exposed, and the blood coming out" (Fig. 2).

Table 1
Characteristics of participants and Differences of Pain ($N = 17$).

Variable	Category	n (%)	Pain M(SD)	Range	t/F or r	p
Age			7.64(2.62)	4–11	−.253	.328
Gender	Boy	8(47.1)	3.75(4.46)		1.082	.296
	Girl	9(52.9)	5.78(3.23)			
Caregiver	Mother	15(88.2)	4.78(4.12)		1.031	.382
	Father	1(5.9)	3.00(4.24)			
	Other	1(5.9)	10.00(−)			
Previous IV experience	Yes	15 (88.2)	4.80(3.69)		−0.066	.948
	No	2 (11.8)	5.00(7.07)			
Diagnosis	GI symptoms	11(64.6)	4.36(3.56)		1.825	.192
	Respiratory symptoms	2(11.8)	10.00(0.00)			
	Fever	3(17.7)	2.67(4.62)			
	Other	1(5.9)	6.00(−)			
Frequency of IV trial	1	15(88.2)	5.07(4.06)		0.697	.497
	2	2(11.8)	3.00(1.41)			
Pain		4.82(3.88)		0–10		

Conversely, some children expressed that the IV injection was not as painful as they thought it would be and that it felt like just a little press or pinch. Three children rated their level of pain as 0 on the FPRS, indicating no pain. "I thought it would hurt but it hurt less than I thought, so I was embarrassed." (Fig. 3). These children selected a face corresponding to 0 points, which means no pain, on the FPRS.

b. Fear

In addition to the many expressions of pain, six children (35.3%) also expressed fear. When asked to draw the feeling of receiving an injection, three children's drawings emphasized the size of the needles and syringes.

An 11-year-old girl not only emphasized the size of the syringe but also expressed feeling a stinging sensation when the needle was inserted. When asked why she drew her picture only in black, she responded that she was scared, and explained that she drew the syringe larger than her arm because she was sick and that her facial expression was close to tears (Fig. 4). On the FPRS, this child selected a face corresponding to 6 points which indicated severe pain.

A 9-year-old girl also drew a very large syringe and her facial expression as frowning eyes and a crying mouth. She expressed her drawing in writing as: "The injection was stingy and scary." (Fig. 5). Prior to the injection, she said, "I'm scared, I don't want to do it." In the FPRS, she selected a face corresponding to 6 points which indicated severe pain.

c. Happy and good

Almost all the children expressed negative feelings associated with IV injections. However, two children identified positive feelings, such as "happy" and "good."

A 5-year-old girl expressed that "I felt good because I felt better after the injection," and "I felt good every time I got an injection."

ii. Parents as my Secure Base

The second theme was named "parents as my secure base," which included two subthemes: "parental holding" and "parental presence." Nearly all the children (94.1%) relied on parental holding and/or their presence to feel secure during IV injection.

a. Parental holding

Most of the children relied on the caring actions of their parents to help them feel secure, such as holding their hands or hugging: "I think

Table 2
Content Analysis of Children's Experience of IV and Pain Management.

Themes	Sub-themes	Statements
Physical and emotional experience	Pain	-It hurts, it stung badly. -It felt like when I cut myself on paper -I thought it would hurt, but it hurt less than I thought, so I was embarrassed. -I didn't know I had an injection. It felt like a pinch when I had an injection.
	Fear	-The injection was stingy and scary. -I am scared. I don't want to do it.
	Happy and good	-I want to get better quickly. When I got injection, it did not hurt than I thought and I felt good because I felt better after the injection. -I felt good because it felt good every time I got the injection.
Parents as my secure base	Parental holding	-It was helpful when mom hold my hand when I got the injection. -It was very helpful when my mom hugged after I got the injection. -Sitting mom's lap and mom hold me and I facing mom.
	Parental presence	-It helped me to have my mom by my side during the injection. -Sitting mom's lap and mom hold me and I facing mom.
Comfort & relief	Preparing	-It is going to hurt this much while the nurse pricking me by her fingernail, so it was less scary. -It might feel like a pinch, It will not take long, it will be soon. It'll be over in a blink of an eye. -I want the nurse to give me the shot at once. I want the nurse give me the shot quickly instead of constantly poking with the needle.
	Distraction and coping	-Mom told me it hurts if you watch when you are getting a shot. I think it would help if I closed my eyes tightly and didn't see the injection being given. -It was helpful for the nurse to tell me an old story. -Thinking to myself that it does not hurt.
	Praising & encouragement	-It was helpful when a nurse praised me for doing well after getting an injection, -It was very helpful when my mom said "You did good job. I am very proud of you -You were being very brave

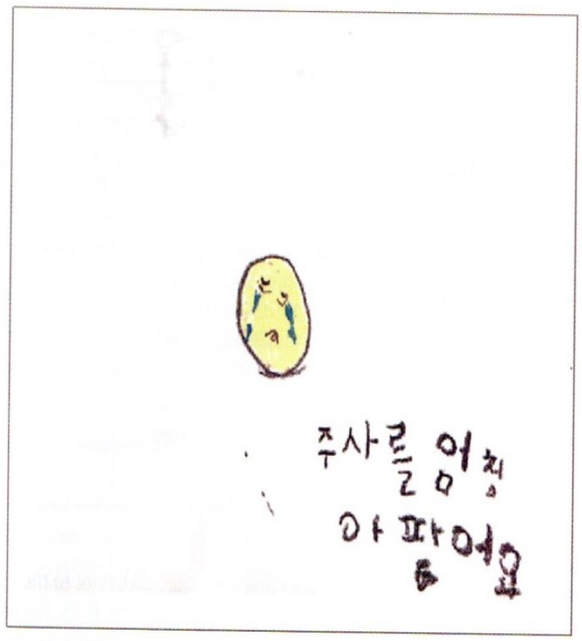

Fig. 1. Drawing by 8-year-old girl.

Fig. 2. Drawing by 11-year-old boy.

Fig. 3. Drawing by 8-year-old boy.

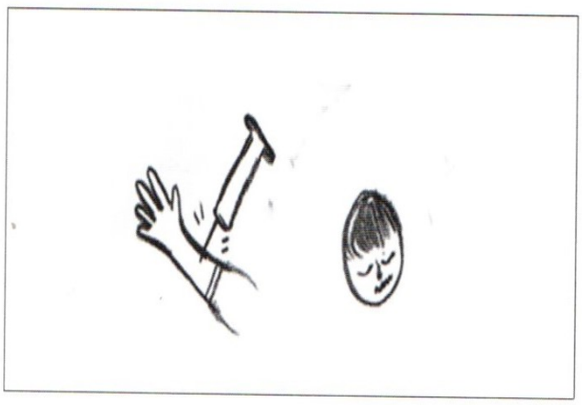

Fig. 4. Drawing by 11-year-old girl.

it would help if my mom hugged me," (11-year-old girl) and "It didn't hurt at all because my mom held my hands" (8-year-old boy).

b. Parental presence

All children expressed feeling secure with their parents. Before the injection, a child said, "I'm scared, I don't want to do it," and her mother's reaction at that time was, "you can't avoid it, so let's do it quickly," and "Don't look at the injection, I'll be next to you." The child's mother held her hand and directed her to look at herself (a 9-year-old girl). Another child said, "It helped me to have my mom by my side during the injection" (7-year-old girl).

iii. Comfort and Relief

The third theme was "comfort and relief", and included three subthemes: "preparing," "distraction and coping," and "praising and encouragement."

a. Preparing

Explaining the steps of the IV injection procedure, receiving simple information on what to expect, and receiving sensory information about what they might feel during needle insertion helped the children to feel more in control. Moreover, children wanted nurses to be well prepared and trained to perform IV injections: "When I asked the nurse if it would hurt a lot, she explained that it was going to hurt 'this much' while pinching me with her fingernails, so it was less scary" (8-year-old boy).

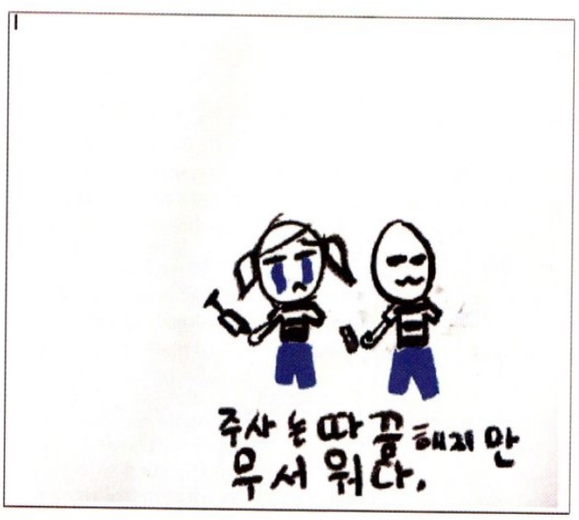

Fig. 5. Drawing by 9-year-old girl.

and relief strategy during pediatric IV procedures. Moreover, parents should be educated and included in the process to increase the effectiveness of parental presence through active involvement.

The children in this study mentioned several strategies for increasing comfort and relief. As a strategy, preparation can be effective in managing distress related to IV injections. In this study, some children (aged 8 and 9 years) reported that their fear decreased when nurses explained how much pain they would experience using behavior or language. Explaining the steps of the procedure, receiving sensory information about what they might feel, seeing the medical supplies that will be used, and offering realistic choices or roles related to the procedure helps children feel more in control (Fein et al., 2012). A review study (Trottier et al., 2019) identified that children over the developmental age of 4 years generally benefit from simple information regarding what to expect when undergoing procedures. However, a previous study reported that education seems to be effective in reducing procedural anxiety in older children but seems to have a negative effect on younger children (Copanitsanou & Valkeapää, 2014). Moreover, exposure-based therapy is recommended for children older than 7 years with a high level of needle fear (McMurtry et al., 2015). Therefore, as Orenius et al. (2018) reported, the provision of age-specific and family-centered preparation before IV injection procedures might lead to a considerable reduction in children's and parental anxiety and improve children's IV-related behaviors. Considering that parental presence and involvement have a significant impact on children's pain and anxiety, interventions should include both parents and children.

Although reassurance by parents or nurses was not a common comfort and relief strategy in this study, some parents and nurses used language to avoid (e.g., "Don't worry," "This won't hurt," and "Don't cry"). What parents and healthcare professionals say and do during their child's pain experiences have been strongly associated with distress and coping during needle procedures and Mahoney et al. (2010) found that parents' behaviors during venipuncture predicted 64% of the variance in children's distress. Reassurance is classified as a distress-promoting behavior because language used for reassuring was usually negatively focused and might communicate the parents' or nurses' worry or fear to the child by unintentionally recognizing that something is to be feared, thereby increasing the child's distress (Cohen, 2008; McMurtry et al., 2010; Moline et al., 2021;). Moreover, the end of a procedure cannot always be predicted or guaranteed reliably (Trottier et al., 2019). Therefore, preparing parents for their children's upcoming IV injections can involve informing and training them in helpful behaviors (e.g., coaching to cope, distraction, praise, and encouragement) and encouraging them to avoid unhelpful behaviors (e.g., excessive, false, or premature reassurance, empathetic comments, criticism, and apologizing) (Trottier et al., 2019). Moreover, nurses should be prepared through training in IV injection skills and comfort and relief strategies to minimize distress related to IV injection (Suleman et al., 2022; Trottier et al., 2019).

Practice implications

The present study findings have implications for nurses working with children and their families in a pediatric setting. The DWT, an arts-based and CCC approach, is a useful and valid method to understand the children's experiences related to their IV injection process. Children visually, auditorily, and verbally expressed their experiences related to IV injection and the alleviation of their pain and fear and suggested comfort and relief strategies. Among the strategies they explored, parental presence and involvement had a significant impact on their pain and anxiety, indicating that interventions should include both parents and children. Children gain comfort and relief within a family-centered care (FCC) context during IV injection procedure. Our findings were similar to those of previous researchers (Foster & Shields, 2020; Foster & Whitehead, 2019) in that CCC and FCC are inter-connected and have synergistic interaction in the pediatric practice settings. Therefore, integration of the concepts of FCC, CCC, and the child and family centered care (CFCC) into practice and research improve healthcare for children and their families.

Limitations

This study has some limitations. First, the study had a small sample size and was conducted in a single pediatric outpatient setting, limiting the generalizability of the results. Further research using engaging methods to explore children's experiences in other settings is warranted. Second, only pain was measured, and fear was not measured separately. Future studies should measure fear and investigate the relation between pain and fear. Third, only children 4 years or older were included in the study based on their language and picture development skills, and based on previous research (Pope et al., 2018); four children who were excluded from the analysis were aged 4–5 years. It is necessary to consider the appropriateness of age at which the DWT could be applied.

Conclusions

Children were able to visually, auditorily, and verbally express their experiences related to IV injections, the alleviation of their pain and fear, and suggest comfort and relief strategies. The DWT is an effective way for children to share their experiences. Nurses should promote children's participation in the development of strategies to reduce the negative perceptions of IV procedures. As parents play an essential role in comforting and relieving children's pain and fear, it is necessary to develop interventional strategies that include both children and parents participation. Additionally, since the language and behaviors of parents and nurses affect children's coping abilities and stress, it is necessary to educate parents and nurses on appropriate strategies to alleviate children's pain and fear. Further research applying the DWT methodology is necessary to understand how children can be better engaged as active partners to achieve more effective comfort and relief of pain and anxiety and to validate its appropriateness and assist in its evolution as a child-centered method.

CREDIT Statement

Jin Sn Kim: Conceptualization, Methodology, Formal analysis, Supervision, Funding acquisition, Writing-original draft, Writing-review & editing.

Declaration of Competing Interest

The authors declare that there are no conflict of interests.

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b. Distraction and coping

Some children described forms of distraction and coping that they found helpful, such as closing their eyes, looking elsewhere, not looking at the injection, nonprocedural talk, imagery, and counting backward. Children also expressed that the behavior of caregivers and nurses encouraged them to cope and actively engage in distracting activities, such as nonprocedural talk: "Mom told me it hurts if you watch when you are getting a shot. I think it would help if I closed my eyes tightly and didn't see the injection being given" (11-year-old girl).

Some children also expressed that they shouted because they believed it would be less painful to scream. While some participants, all of whom were boys, expressed holding back or screaming on the inside because they felt like they had to endure it.

"I think it hurts less if I scream." (8-year-old girl)

"Even if it hurts, I think I have to endure it." (6-year-old boy)

"I think I have to endure the pain. I screamed inside because it hurts." (10-year-old boy)

c. Praising and encouragement

The children expressed that supportive communication, including praise and encouragement from caregivers or nurses, was helpful. Praising the children for doing well after receiving the injection was also helpful, and some needed it. In addition, it was helpful to say something to encourage them.

"It was helpful when a nurse praised me for doing well after getting an injection." (5-year-old girl) "You were being very brave." (10-year-old boy)

Discussion

The major strength of this study is that children's experiences of IV injections were directly examined from their perspective using the DWT. Listening to the children is the most valuable source of information to improve their well-being (Kleye et al., 2021; Piazza et al., 2022). As with arts-based research methods, the DWT enables children to express their feelings, thoughts, and ideas (Caldairou-Bessette et al., 2020; Carter & Ford, 2013). Using this approach, this study found that children were capable of providing detailed accounts of their pain perceptions and experiences of IV injections. As a child-centered and art-based perspective, the DWT was a useful and powerful tool for pediatric nurses to understand children's feelings and for children to share their experiences and enable them to have a say in the decision-making of IV-related management.

The mean pain score on the FPRS was 4.82 which indicated a moderate level of pain. The perceived pain intensity and expression varied among the children. The DWT revealed that children experienced fear during IV injections. Previous studies have identified that fear and pain play an important role in children's experiences with IV procedures (Hedén et al., 2020; Kleye et al., 2021). Hedén et al. (2020) identified that fear level was positively correlated with pain level and reported a 11% variance in pain during needle procedures. Moreover, they (Hedén et al., 2020) also found that fear levels were higher than pain levels in children younger than 12 years and suggested that it could possibly be so because younger children might have less developed coping strategies and lower cognitive development.

Although a very small needle was used, it was intimidating to children. One child drew their skin torn, revealing the flesh and bones inside, and expressed it in the form of dripping blood. Another child drew a large syringe and highlighted the site of needle insertion. This finding was consistent with that of a previous study (Hands et al., 2009a, 2009b) where the size of the syringe and needle was emphasized when expressing the venipuncture experience in drawing, and the venipuncture experience was described as "painful and scary," and "it feels like someone is stabbing me." Therefore, pediatric nurses and parents should acknowledge and consider not only pain but also fear in children, including the phases of information, preparation, and evaluation of IV procedures, especially in younger children (McLenon & Rogers, 2019; Sørensen et al., 2020).

In this study, black and yellow were commonly used colors to draw which represented their experience of IV injection. A concept analysis of children's description of pain through drawings and dialogs (Ebrahimpour et al., 2019) reported that, in children, the colors red and black conceptualized the pain they experienced. In fact, an Australian study (Pope et al., 2018) also reported that children most commonly chose red and black to represent aspects of their pain and fear in their drawings. Moreover, a Turkish study identified that the most commonly used colors in drawings to represent fear among 6- to 10-year-old children were black, red, brown, and yellow (Talu, 2019). By choosing these colors, children expressed the pain and fear they experienced during IV injections. Considering their color choices in this study, children's drawings may be useful as pain and fear assessment and evaluation tools.

Contrary to previous research (McLenon & Rogers, 2019; Nascimento et al., 2019), the pain intensity rated using the FPRS was not significantly different according to the gender and age in this study. However, in this study, the children's expressions of their behaviors and coping skills in terms of pain and fear of IV injections somewhat differed based on their gender. Compared to girls, boys tended to express their emotions internally and stoically, which was consistent with the findings of an integrative review on the role of gender in pain perception and expression (Nascimento et al., 2019). This review stated that females seem to be associated with lower pain tolerance and pain tolerance thresholds, as well as a greater propensity to report painful sensations. However, a recent study (Earp et al., 2019) reported that the issue of gender bias is that boys are more stoic, and girls are more emotive, which may influence the adult's assessment of children's pain. Gender differences in IV experiences, in this study, could be related to the Korean culture, where it is considered inappropriate for boys to cry, potentially influencing their behavioral expression of pain (Yu & Kim, 2021). Cultural differences may influence the behavior, reactions, and responses of both adults and children to pain and distress during needle procedures (Finley et al., 2009; Yu & Kim, 2021). Further research is needed to identify the impact of the children's gender on their perception of IV experiences, and the cultural influences thereupon.

Although this study did not quantitatively measure fear, the DWT showed that younger children have greater fear related to IV injection, which was consistent with the findings of a previous systematic review and meta-analysis (McLenon & Rogers, 2019) which reported that the fear of needles was highest in children, especially younger children, and it decreased with age. Considering this, more attention should be paid to alleviate fear in the younger age group.

Parents played an important role in supporting their children and reducing their pain, anxiety, and distress related to the IV procedure in this study, which was consistent with previous studies (Azak et al., 2022; Goha et al., 2020; Sağlık & Çağlar, 2019). Majority of children in this study expressed that parental presence, holding hands, or hugging them during IV injections were helpful. A systematic review (Azak et al., 2022) found that parental presence and involvement during invasive procedures effectively reduced children's pain levels. Azak et al. (2022) emphasized that parents should be involved in the process, not just present with their children, and that it is appropriate for the philosophy of family-centered care. Therefore, parental presence and involvement should be encouraged as an easy and effective comfort

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