



## Power of Play Therapy: Does Play Therapy Have an Effect on Pain in Peripheral Venous Catheterization Applied to Children?

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### ABSTRACT

**Background:** This research was conducted as a quasi-experimental study to determine the effect of play therapy on pain in peripheral venous catheterization applied to children.

**Method:** The universe of the study consisted of patients between the ages of 3-6 who were hospitalized in the pediatric service of a hospital between June 2019 and August 2019. In the study, 57 patients constituted the sample size by using simple random sampling method and by performing power analysis. While those who participated in the first peripheral venous catheterization procedure constituted the control group, those who participated in the second peripheral venous catheterization process constituted the experimental group. This research was supported by Atatürk University Scientific Research Office (BAP).

**Results:** In the peripheral venous catheterization applied to the patients, a significant difference was found between the test results of the control group and the experimental group Wong-Baker and Flacc Pain Scales. ( $p < 0.001$ ). It was determined that the experimental group Wong-Baker and Flacc Pain Scale scores of the patients were lower than the scores of the control group Wong-Baker and Flacc Pain Scales. In the peripheral venous catheterization applied to the patients, a significant difference was found between the control group and the experimental group Flacc Pain Scale sub-dimension results ( $p < 0.001$ ,  $p < 0.001$ ,  $p < 0.001$ ,  $p < 0.001$ ,  $p < 0.001$ , respectively).

**Conclusions:** In the study, it was observed that the pain levels of play therapy in peripheral venous catheterization of children were significantly reduced with play therapy.

**Key words:** Pain, nursing, play therapy, peripheral venous catheterization,

### What's Know

Non-pharmacological methods applied to reduce children's pain are giving sugary substances, giving a pacifier, listening to music, applying massage, changing position, providing skin contact with the mother, touching, etc.

Play therapy is a technique that has been applied in the treatment of children, in the protection of their psychological health and the treatment of psychological disorders.

### What's New

In line with the results, it is recommended to use play therapy to reduce the perception of pain during peripheral venous catheterization in children.

## 1.INTRODUCTION

Medical practices, involving multiple disciplines and is a process consisting of several stages. During the administration process, some drugs are delivered into the vein by various means. One of these is intravenous catheters.<sup>1</sup> A peripheral venous catheter (PVC) is one of the most important, indispensable, and common applications in modern medical therapy<sup>1</sup> "Peripheral Intravenous Catheterization (PIC)" is the placement of an intravenous catheter into the peripheral vein lumen. PIC; is used in the administration of fluids and drugs needed in high serum concentrations, in resistant infection, in need of parenteral treatment, in need of continuous bolus analgesia and emergency treatment<sup>2,3</sup>

Today, PIC has a vital place in administering fluids and drugs used in the treatment of patients. Along with the constantly developing technology, significant development is taking place in this field.<sup>4</sup> Although the application of PIC seems to be an insignificant minor intervention. It can be perceived as an excruciating and scary procedure by children.<sup>5</sup> Pain that occurs as a result of invasive procedures is primarily seen in pediatric patients. During the

invasive procedures, the crying and screaming of pediatric patients show the pain and fear they have experienced. This fear sometimes causes behaviors such as refusing treatment. Consequently, a severe prejudice may occur in children against illness, hospital, healthcare personnel, and treatment practices.<sup>6</sup>

In addition to various pharmacological methods, non-pharmacological methods are used for pain control in children as well. Non-pharmacological therapy; are applications that reduce or eliminate pain by causing the secretion of natural endorphins and morphine in individuals.<sup>7</sup> Non-pharmacological methods applied to reduce children's pain are giving sugary substances, giving a pacifier, listening to music, applying massage, changing position, providing skin contact with the mother, touching, etc.<sup>8-10</sup> One of these methods is play therapy. Play therapy is a technique that has recently been applied in the treatment of children, in the protection of their psychological health and the treatment of psychological disorders.<sup>11</sup>

Play helps children think creatively, make decisions independently, take responsibility, imagine, and plan. During play therapy, children communicate with toys and express their basic emotional needs through games. In addition, during play therapy, children reveal their symbolic play skills instead of language skills and begin to get to know their inner world. These reflexes help them forget about previous traumatic experiences and empty the emotional subconscious that these experiences have accumulated with play therapy. As a result, it will enable the children to control themselves.<sup>12</sup>

The main goal of pain management in children is to support the child's coping by reducing the intensity, duration, and amount of pain. Although many studies aimed at reducing the pain experienced in different invasive applications in children<sup>5, 13-19</sup>, there is no study using play therapy to reduce pain associated with a peripheral venous catheter. In this study, which was designed in a quasi-experimental design based on this point, the aim was to evaluate the effect of the play therapy method on the pain level observed in children during peripheral venous catheterization.

The following hypotheses will be tested in this study:

**H<sub>0</sub>:** "Play therapy has no effect on pain in peripheral venous catheterization applied to children."

**H<sub>1</sub>:** "Play therapy has an effect on pain in peripheral venous catheterization applied to children."

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## 2. METHODS

The study sample consisted of all patients in the 3-6 age group hospitalized in a public hospital pediatric ward between June 2019 and August 2019 and underwent peripheral venous catheterization. There were 607 children in the 3-6 age group who were hospitalized in the relevant clinic for one year (January 1, 2018, to December 31, 2018) and underwent PIC procedure, and it was calculated that with an error margin of 10% and a confidence level of 95%, at least 57 people could provide the sample size at a reasonable and reliable level. Therefore, the study sample consisted of 57 patients hospitalized in a public hospital pediatric ward between June 2019 and August 2019 who met the research criteria and were selected using a simple random sampling method. Fourteen patients who participated in the study and were discharged without establishing second vascular access could not be included in the study. Instead of these patients, 14 new patients were recruited. "

Inclusion criteria of pediatric patients in the study;

- Those who did not have pain before catheterization,
- Those who are with their mother at the hospital,
- Those whose disease status is stable before the vascular access (peripheral venous catheterization) procedure,
- Children who underwent peripheral venous catheterization for the first time on hospitalization were included in the study.

The first peripheral venous catheter applications were applied at the first hospitalization, and these applications constituted the control group; the second vascular access application was performed in children who had to repeat the peripheral venous catheter application in cases such as swelling, inflammation, and pain in the vascular access and this application constituted the experimental group.

### 2.1. Data Collection Tools

Informed Consent Form, sociodemographic information form, and two pain scales to measure pain during peripheral venous catheterization, the "Wong-Baker Pain Scale" and the "Flacc Pain Scale", were used for data collection.

#### Sociodemographic Information Form

This form was created by researchers in line with the literature<sup>13-17</sup>. The sociodemographic information form contains introductory information about the children participating in the study and their parents.

#### Wong-Baker Pain Scale

Scoring is made between "0" and "10" on this scale. "0" represents no pain at all, and "10" represents the most severe pain. From 0 to 10, the severity of the pain is evaluated in six stages with facial expressions.<sup>20</sup>

### Flacc Pain Scale

Each category is scored between 0 and 2. The total score varies between 0 and 10. 0 point indicates that the child is calm and painless; a score between 1 and 3 indicates that the child has mild pain; a score between 4 and 6 indicates that the child has moderate pain; a score between 7 and 10 represents that the child has a significant illness and associated severe pain. "FLACC Pain Scale" is the most critical data collection method for determining "postoperative pain" in pediatric patients.<sup>20</sup>

### 2.2. Data Collection Phase

After the decision of peripheral venous catheterization was made with the physician's request for children aged 3-6 years hospitalized for treatment, their families were informed about the study, their consents were obtained, and the sociodemographic information form was filled.

**First Peripheral Venous Catheterization Procedure (Control Group):** After deciding peripheral venous catheterization by the physician's order for the patients included in the study, the child was taken to the room PVC procedure be performed with his family. The PVC procedure was performed on the patient's hand using the 24 numbered (yellow) cannula. The same ward nurse performed all peripheral venous catheter applications (experimental and control applications). The child to be subjected to peripheral venous catheterization was laid on a stretcher and was ensured to be with his/her mother. While peripheral venous catheterization was performed by the ward nurse, the researcher (Halime Yıldız) made the child's pain assessment using the "Flacc" and "Wong-Baker" pain scales.

**Second Peripheral Venous Catheterization Procedure (Experiment Group):** While the treatment of the child who had the first peripheral venous catheter procedure was continuing, a second peripheral venous catheterization procedure was performed in cases such as swelling, inflammation, or pain around the PVC or when the change of PVC was decided upon the physician's order. In the second procedure applied to the same child, the child was taken to the operation room with his/her mother. For peripheral venous catheterization, the child was taken to the same room where the procedure was to be performed, and it was ensured that the child was with his/her mother. The same ward nurse performed peripheral venous catheter application. PVC was performed on hand with the number 24 (yellow) cannula. During the procedure, play therapy was started by the researcher (Halime Yıldız). For play therapy, specially prepared toys were given to the children, as four toys for boys and girls. The child was asked to choose one of these toys, and they started to play. At the end of the procedure, playing games with the child continued for five more minutes. During the procedure, the investigator performed a pain assessment using the "Flacc" and "Wong-Baker" pain scales.

### 2.3. Data Analysis Methods

In this study, the analyses were made with the SPSS 22 program. Whether the variables fit the normal distribution was tested with the Shapiro-Wilk test, and the variables that did not fit the normal distribution were given as median (minimum-maximum) values. "Wilcoxon Sign Test" was used to analyze the differences between the two dependent groups. The significance level was taken as 0.05.

### 2.4. Ethical Aspect of the Research

For the study, approval dated 29.11.2018 was obtained from Ethics Committee and official permission dated 12.03.2019 was obtained. In addition, verbal and written consent was obtained after the parents of the children who participated in the study were informed about the purpose of the study and for what purposes the results were obtained.

## 3. RESULTS

**Table 1. Sociodemographic Characteristics of the Patients**

	n	%
<b>Age</b>		
3	20	35,1
4	13	22,8
5	12	21,1
6	12	21,1
<b>Mother Education Level</b>		
Illiterate	12	21,1
Primary School	14	24,6
Middle School	14	24,6

High School	12	21,1
University	5	8,8
<b>Mother Education Level</b>		
Illiterate	5	8,8
Primary School	5	8,8
Middle School	10	17,5
High School	23	40,4
University	14	24,4
<b>Working Status of the Mother</b>		
Not working	36	63,2
Working	21	36,8
<b>Working Status of the Father</b>		
Not working	10	17,5
Working	47	82,5

Findings obtained in the study are presented in tables. Table 1 shows the sociodemographic characteristics of the patients. Of the patients included in the study, 50.9% were girls, 35.1% were three years old, 21.1% had literate mothers, and 40.6% had fathers with a high school education level.

**Table 2.** Distribution of the characteristics of the patients regarding the disease and the applications of PVC in the hospital

<b>Previously Hospitalized Status</b>	<b>n</b>	<b>%</b>
Yes	27	47,4
No	30	52,6
<b>Chronic Disease Status</b>		
Yes	4	7,0
No	53	93,0
<b>Number of Hospitalizations</b>		
0	30	52,6
1	9	15,8
2	9	15,8
3	4	7,0
4	5	8,8
<b>Previous PVK Application Status</b>		
Yes	27	47,4
No	30	52,6
<b>Number of PVK Applications</b>		
0	30	52,6
1	5	8,8
2	5	8,8
3	3	5,3
4 and above	14	24,5

Table 2 shows the distribution of the characteristics of the patients regarding the disease and the applications of PVC in the hospital. 47.4% of the patients had been hospitalized before, and 93% had no chronic disease. In addition, 52.6% of the patients did not receive PVC at all.

**Table 3.** Comparison of the Wong-Baker Test Results of the Patients in the Experimental and Control Groups

	Control Group	Experiment Group	Test Value	p
	Medyan	Medyan		
	(Min-Maks)	(Min-Maks)		
Wong Baker	5(4-6)	3(2-5)	-6,383	<0,001

*p<0,05, Wilcoxon Sign Test*

Table 3 compares the Wong-Baker test results of the patients in the experimental and control groups. There is a significant difference between the control group and the experimental group Wong-Baker test results in peripheral venous catheterization applied to the patients ( $p<0.001$ ).

**Table 4.** Comparison of Flacc Pain Scale Test Results of Patients in Experimental and Control Groups

	Control Group	Experiment Group	Test Value	p
	Medyan	Medyan		
	(Min-Maks)	(Min-Maks)		
Flacc	10(7-10)	7(4-9)	-6,639	<0,001

*p<0,05, Wilcoxon Sign Test*

Table 4 shows the comparison of the Flacc Pain Scale test results of the patients in the experimental and control groups. There is a statistically significant difference between the Flacc Pain Scale results of the patients in the experimental and control groups ( $p<0.001$ ).

**Table 5.** Comparison of Flacc Pain Scale Sub-Dimensions of Patients in Experimental and Control Groups

	Control Group	Experiment Group	Test Value	p
	Medyan(Min-Maks)	Medyan(Min-Maks)		
Face	2(1-2)	1(1-2)	-5,385	<0,001
Legs	2(1-2)	1(0-2)	-5,231	<0,001
Movements	2(1-2)	1(1-2)	-5,745	<0,001
Cry	2(2-2)	1(1-2)	-5,657	<0,001
Consolation	2(1-2)	1(0-2)	-5,856	<0,001

*p<0,05, Wilcoxon Sign Test*

Table 5 compares the Flacc Pain Scale sub-dimensions of the patients in the experimental and control groups. There is a significant difference between the control group, and the experimental group Flacc Pain Scale sub-dimension results in peripheral venous catheterization applied to the patients ( $p<0.001$ ,  $p0.001$ ,  $p0.001$ ,  $p0.001$ ,  $p0.001$ , respectively).

#### 4. DISCUSSION

The findings obtained from the study conducted to investigate the effect of play therapy in reducing the pain caused by peripheral venous catheterization applied to children are discussed in the light of the relevant literature.

As a result of the study, it was found that pain was reduced by play therapy applied during peripheral venous catheterization in children according to the Wong-Baker pain scale (Table 3) and the Flacc Pain Scale (Table 4). During the venous catheterization procedure in which play therapy was applied, the children's pain levels were lower than the venous catheterization procedure without play therapy. In addition, a significant difference was found between the experimental and control groups in the sub-dimensions of the Flacc Pain Scale in the study as well (Table 5). Based on this finding, it can be said that play therapy reduced the pain of children in the experimental group during a peripheral venous catheterization procedure, and playing games was effective in pain management. This result supports the  $H_1$  hypothesis that "Play Therapy Has Effect on Pain in Peripheral Venous Catheterization Applied to Children". The findings of our study are in line with the literature. Besides, it is stated in the literature that non-pharmacological methods can be effective

on their own, especially in pain due to invasive interventions, and when used together with pharmacological methods, they increase the effectiveness of drugs.<sup>7</sup> In recent years, many non-pharmacological methods have been used to reduce the pain caused by the procedures applied to children in nursing practices and have an essential place in reducing the child's pain. With these applications, play therapy has started to take an important place, and the results of this study are thought to reveal the importance of this therapy. According to the meta-analysis results of Bukola et al.<sup>21</sup>, when the studies conducted are examined, they examined the effectiveness of the distraction technique in relieving procedural pain in pediatric oncology patients; the pain was measured using self-report scales, observation reports, and physiological parameters. According to the results of four studies in which pain was evaluated with self-report scales, it was found that the technique of diverting attention was effective in reducing procedural pain. Considering the studies in which distraction methods were used in children; Vagnoli et al.<sup>16</sup> used pet-assisted intervention, Risaw et al.<sup>17</sup> used distraction cards, Yoo et al.<sup>18</sup> used watching animated movies, Gedam et al.<sup>19</sup> used a toy with light and sound, Sadeghi et al.<sup>22</sup> used a softball squeezing activity. In their study, Crevatin et al.<sup>23</sup> divided children into two groups during the bloodletting process, one of the groups played the game of angry birds, while the other group had activities such as playing puppet games, singing, popping bubbles, and reading a book. As a result of these studies, distraction has been determined to be effective. Ballard et al.<sup>24</sup> created and used distracting kits (including flute, finger puppet, musical teddy bear, stress ball, stickers) to be used during painful procedures, and it was determined that the kits significantly reduced the perception of pain. Also, in the study where Dovney and Zun<sup>25</sup> used the method of watching cartoons to relieve pain during various painful procedures in children who were admitted to the emergency unit, the pain was evaluated 5 minutes before, during, and 5 minutes after watching cartoons and the method was found to be effective.

Considering the studies using non-pharmacological methods other than the distraction method, Redfern et al.<sup>26</sup> and Canbulat and İnal<sup>27</sup> found thermomechanical stimulation (Buzzy), Ali Zarghan et al.<sup>28</sup> found massage, Bikmoradi et al.<sup>29</sup> found aromatherapy to be effective in reducing the perception of pain in invasive procedures. These studies prove the effectiveness of non-pharmacological pain management methods and the importance of their widespread use in clinical areas. Similarly, in other studies in which different attempts were made for distraction, it was observed that this method effectively reduced the pain levels of the experimental group.<sup>13,15,28</sup>

When the results of the studies are examined, the play therapy method applied in nursing practices in clinics and outside of the clinic is effective in many areas. When looking at the studies using play therapy, it has been reported that playing with toys made of materials used for invasive interventions reduces invasive intervention pain in children with cancer<sup>30</sup>.

In another study, in a randomized controlled study conducted by Crevatin to examine the effect of the play therapy method on anxiety and pain level, routine information was given to the children in the intervention group before the procedure, and play therapy was administered 1 hour later. After the procedure, the children had the procedures done more comfortably, and it was reported that they did not feel pain.<sup>23</sup> Tsai et al.<sup>14</sup> investigated the effect of play therapy on fear arising from radiotherapy intervention in children receiving brain tumor treatment. A total of 19 children, 10 in the experimental group and 9 in the control group, were included in the study. The applied play therapy reduced the fear in the child and enabled the child to cooperate more during the treatment process and develop the doctor-patient relationship.

## 5. CONCLUSION AND RECOMMENDATIONS

As a result of our study, it has been determined that;

- There is a significant difference between the control group and the experimental group Wong-Baker test results in the peripheral venous catheterization applied to the patients,
- There is a statistically significant difference between the Flacc Pain Scale results of the patients in the experimental and control groups,
- The number of previous hospitalizations and the number of PVC insertions do not have any effect on pain.

### 5.1. Implications for Practice

In the study, it was observed that the pain levels of play therapy in peripheral venous catheterization of children were significantly reduced with play therapy. In line with these results, it is recommended;

- To use play therapy to reduce the perception of pain during peripheral venous catheterization in children,
- To pay attention to features such as the development level of the children and informing the family members about play therapy during the peripheral venous catheterization procedure to be performed on children,
- To conduct studies using play therapy in other painful, invasive procedures applied to children,
- To conduct studies by comparing play therapy applied during painful procedures in children with different age groups and other non-pharmacological methods.

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The authors have declared no conflicts of interest for this article

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## DISCLOSURE

The authors have declared no conflicts of interest for this article

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