




The Effect of a Musical Toy on Preschool Children's Pain and Anxiety During Blood Collection

Okul Öncesi Dönem Çocuklarında Kan Alma İşlemi Sırasında Işıklı Dönen Müzikli Oyunağın Ağrı ve Anksiyeteye Etkisi

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ABSTRACT

Objective: This study examined the effect of providing a lighted, rotating musical toy on preschool children's pain and anxiety during a blood collection procedure.

Methods: The randomized controlled study was conducted on a sample of children aged 4-6 years who applied to the blood collection unit of a state hospital in Turkey from July 1 through August 1, 2022. The data were obtained from 95 children who met the research criteria (48 in the control group and 47 in the intervention group). Stratification and block randomization methods were used to determine the experimental and control groups. The variables of gender and fear of interference were used in the stratification of the children. The Family and Child Information Form, Child Fear and Anxiety Inventory, and Wong-Baker Facial Expression Rating Scale were used to collect the data.

Results: The pain scores of the children in the experimental group were found to be lower (1.42 ± 1.05) than those in the control group (2.81 ± 1.23), and the result was statistically significant ($P < .001$). During the procedure, the mean Child Fear and Anxiety Inventory score of the children in the experimental group (1.21 ± 0.97) was lower than that of the control group (2.72 ± 1.10), and the difference was statistically significant ($P < .001$).

Conclusion: This study found that providing a lighted, rotating musical toy to children aged 4-6 during blood collection effectively reduced their pain and anxiety. In line with these results, it is recommended that nurses and parents use such a toy in blood collection units to reduce pain and anxiety in children.

Keywords: Pain, anxiety, child, bloodletting, musical toy

ÖZ

Amaç: Bu araştırma, okul öncesi dönem çocuklarında kan alma işlemi sırasında uygulanan ışıklı dönen müzikli oyunağın ağrı ve anksiyete üzerine etkisini incelemek amacıyla yapılmıştır.

Yöntemler: Araştırma randomize kontrollü olarak gerçekleştirilmiştir. Araştırmanın evrenini 1 Temmuz- 1 Ağustos 2022 tarihleri arasında Türkiye'de bir devlet hastanesinde, kan alma birimine başvuran 4-6 yaş arası çocuklar oluşturmuştur. Örneklemini ise belirtilen tarihler arasında kan alma birimine başvuran ve araştırma kriterlerine uyan 95 çocuk oluşturmuştur. Veriler 95 çocuktan (kontrol grubunda 48, ışıklı dönen müzikli oyuncak grubu 47) elde edilmiştir. Deney ve kontrol grupların belirlenmesinde "tabakalandırma ve bloklu randomizasyon yöntemleri" kullanılmıştır. Çocukların tabakalandırılmasında cinsiyet ve girişimden korkma durumu değişkeni kullanılmıştır. Verilerin toplanmasında, Aile ve Çocuk Bilgi Formu, Çocuk Korku ve Anksiyete Ölçeği ve Wong-Baker Yüz İfadelerini Derecelendirme Ölçeği kullanılmıştır.

Bulgular: Araştırmada işlem sırasında deney grubundaki çocukların ağrı puan ortalamaları ($1,42 \pm 1,05$) kontrol grubuna göre ($2,81 \pm 1,23$) düşük ve istatistiksel olarak anlamlı bulunmuştur ($P < ,001$). İşlem sırasında deney grubundaki çocukların Çocuk Korku ve Anksiyete Ölçeği puan ortalaması ($1,21 \pm 0,97$) kontrol grubuna göre ($2,72 \pm 1,10$) düşük ve istatistiksel olarak anlamlı bulunmuştur ($P < ,001$).

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Sonuç: Bu araştırma sonucunda kan alma işlemi sırasında 4-6 yaş grubu çocuklarında uygulanan ışıklı dönen müzikli oyuncakların çocuklarda ağrı ve anksiyetenin azalmasında etkili olduğu bulunmuştur. Bu sonuçlar doğrultusunda, kan alma birimlerinde çocuklarda ağrı ve anksiyeteyi azaltmak için hemşireler ve ebeveynler tarafından ışıklı müzikli dönen oyuncakların kullanılması önerilmektedir.

Anahtar Kelimeler: Ağrı, anksiyete, çocuk, kan alma, müzikli oyuncak

INTRODUCTION

Needle prick procedures, such as venepuncture during blood collection, are the main source of pain and anxiety in children. The effects of these painful procedures in childhood continue into adulthood and may cause negative health outcomes, such as avoidance of health personnel and needle phobia in response to increasing pain and anxiety.¹⁻³

Since preschool children believe that needle intervention will disrupt their body integrity and lead to disability, they are afraid of the people who perform the intervention. At the same time, they think of this intervention as a punishment for not listening to their parents.⁴ Because of these thoughts, preschool children may experience negative conditions such as anxiety and pain.^{2,5,6} Addressing children's pain and anxiety in a timely manner using an effective method can reduce the pain and anxiety that may occur in later procedures. Therefore, pediatric nurses should manage invasive interventions, such as vascular puncture.⁷

Distraction, one of the more common methods to reduce pain and anxiety in children, is an attention activity in which children direct their attention to another stimulus (e.g., music therapy or a toy);⁸ it has been shown to be effective in reducing pain and anxiety in children during intravenous procedures by healthcare professionals and their families.⁹ Some distraction methods include listening to music, wearing virtual reality glasses, playing with distraction cards, watching cartoons, playing video games, and using toys.^{5,10-13} For distraction to be an effective intervention, it must be appropriate to the age of the child. In young children and infants, attention can be diverted with concrete objects, and sound toys and visual aids can be effective in distracting preschool children. Play, meanwhile, allows children to make sense of the various events and situations they encounter in their lives and can control the stresses that children experience and enable them to express their feelings.¹⁴

Therapeutic play is an activity provided by healthcare workers to ensure the physical and emotional recovery of children in accordance with their age and cognitive development. Therapeutic play activities may include toys, art, storytelling, notebooks, and baby display.¹⁵ In the case of therapeutic toys, they must be designed in accordance with the age of the child to reduce pain and anxiety.¹⁶ Studies in the literature have examined the use of therapeutic games and toys during invasive procedures,^{6,17-19} but there is very little research on the use of therapeutic games and toys in children aged 4-6 years during pediatric blood collection, and no study has been found that examines the effect of a lighted, moving, musical toy on pain and anxiety in children in that age range. Thus, this research examined the effect of a lighted, rotating musical toy on pain and anxiety in preschool children during blood collection. The study's hypotheses are described later.

Hypotheses of the study

The hypotheses of the study were as follows:

H₁: Implementing the toy distraction method during child blood collection reduces pain in children.

H₂: Implementing the toy distraction method during child blood collection reduces anxiety in children.

METHODS

Study Design

The research was a randomized controlled experimental study.

Setting and Sample

The study population comprised 95 children who came to the blood collection outpatient clinic of a state hospital from July 1 through August 1, 2022, and whose blood was taken in accordance with the research criteria.

Before the study started, a power analysis was performed for the estimated sample size, which found that the study should be conducted with at least 82 children to yield 80% power at the 95% confidence interval and 0.05 significance level. It was planned to include 100 children (50 in the experimental group and 50 in the control group), but the control group comprised 48 children and the experimental group 47 for reasons including unsuccessful blood sampling and the mother's or child's desire to leave the study. According to the results of the "t-test in independent groups" in which the post-test results of the experimental and control groups were compared, it was determined that the effect size of the study conducted with a total of 95 participants, 48 in the experimental group and 47 in the control group, was 1.46 (high level) and the power was 0.99 at 0.05 significance level and 95% confidence interval (mean 1: 2.72 ± 1.10, mean 2: 1.21 ± 0.97).²⁰ This study was guided by the CONSORT checklist (Figure 1).

Inclusion Criteria

- Children aged 4-6 years without visual, hearing, mental, or neurological impairments
- No febrile illness at the time of application.
- No history of sedative, analgesic, or narcotic substance use within 24 hours before admission
- No chronic disease.

Allocation

The stratification and block randomization methods were used to assign the experimental and control groups, and the variables of gender and fear of interference were used in stratifying the children. For the gender variable, girls and boys were stratified, while the fear of bloodletting variable was stratified as afraid and not afraid. Randomization with blocks was applied. In the study, 50 children were included in each of the research groups, ensuring that the layers were repeated 5 times (2 × 2 × 5), and the closed envelope method was used to prevent bias in the assignment of stratified children to the experimental and control groups. To prevent a child in one group from being affected by the procedure applied to the other group, the data of the other group were collected after the data of the first group had been completed. The

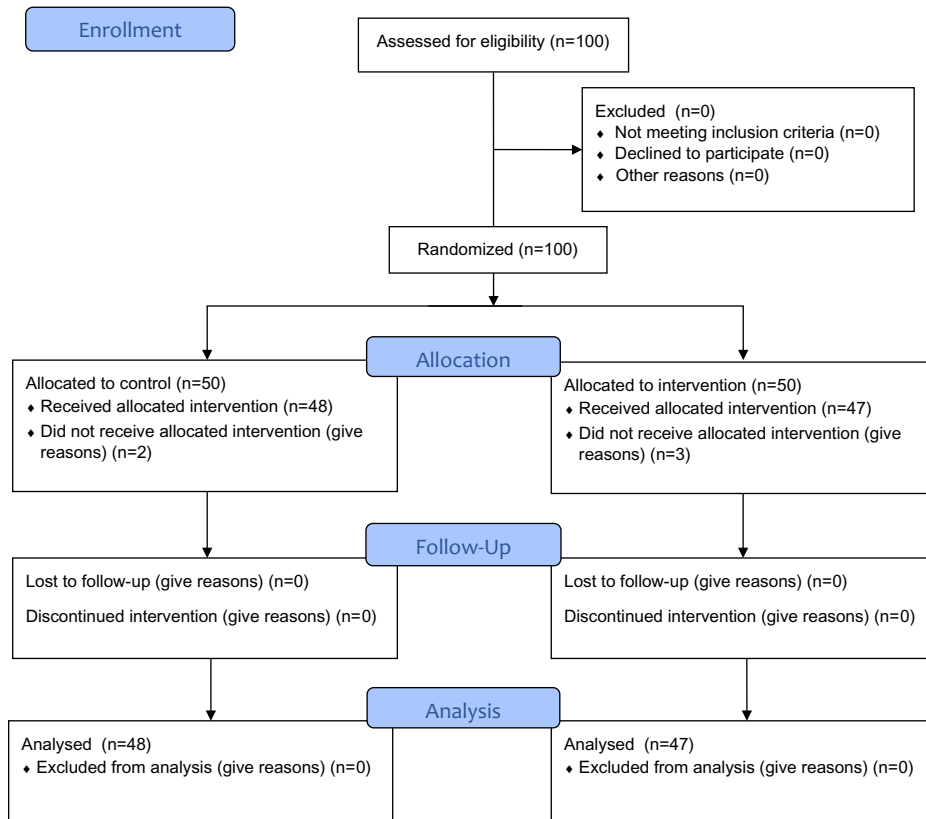


Figure 1. Flow of Study.

data collection order of the groups was determined by the closed envelope method.

Data Collection Instruments

The research data were collected using a family and child information form, the Wong–Baker Facial Expression Rating Scale (WB-FAS), and the Child Fear and Anxiety Inventory (CFAI).

Family and Child Information Form

In this form, which was prepared by the researchers by reviewing the literature,^{6,11,13} there are 9 questions about the characteristics of children and their families (gender, age, fear of intervention, age of parents, family type, education level of parents, and income status).

Wong–Baker Facial Expression Rating Scale (WB-FAS)

Developed by Wong and Baker in 1981 and revised in 1983, the WB-FAS is used on children aged 3–18 years. The scale shows 6 faces that represent increasing pain intensity from left to right. The leftmost face smiles, indicating a painless state, while the rightmost face corresponds to the most severe pain. The 6 facial expressions are scored 0 to 5 from left to right (0 points = very happy/no pain, 5 points = most severe pain). As the scale's score decreases, pain tolerance increases, and, as the score increases, pain tolerance decreases. When the scale is employed, the child is told that each face belongs to a person, that the happy face has no pain, and that the sadder faces feel from a little to a lot of pain. Children are instructed to choose the face that best expresses their feelings.^{21,22}

Child Fear and Anxiety Inventory (CFAI)

The Child Anxiety Scale-Dispositional (CAS-D) scale was developed by Ersig et al²³ to measure the anxiety level of children aged

4–10 years. The CAS-D score can vary between 0 and 10 points.²³ Devised by McMurtry et al²⁴ in 2011, the CFAI measures levels of fear in children. The child is shown a picture with 5 facial expressions that are scored from 0 to 4 points. This scale can be employed by both researchers and families to measure fear and anxiety before and during the procedure. A value of 0 indicates “no fear and anxiety,” while a value of 4 indicates “the highest fear and anxiety.” The child anxiety scale state and child fear scale were translated into Turkish by Gerçeker et al.²⁵

Blood Collection Procedure

Blood was drawn from all the children in the pediatric blood collection outpatient clinic by the same experienced nurse, who had worked in the clinic for 5 years. Blood collection was performed in the morning hours (8 AM–12 AM). During blood collection, the blood collection area was cleaned in accordance with aseptic rules. A black-tipped needle with a diameter of 22 Guaren was used for blood collection. All children in the pediatric blood collection outpatient clinic underwent blood collection by the same nurse. Blood collection attempts that were not successful in a single attempt were excluded from the study. The parents accompanied their children before, during, and after the procedure. Before the procedure, the child, parent, and researcher filled out the WB-FAS and CFAI, which were again completed by the child, parent, and researcher during the procedure.

Intervention

Experimental Group

The researcher used a lighted, rotating musical toy in the experimental group. The children were given the option to play with 1 of 2 toys featuring different figures that dance while the toy emits light and music, thus distracting the children. The adaptability of

the children included in the study was taken into account. Non-adaptive children (refusing toys, having crying fits, etc.) were excluded. The toys were introduced to the children and their families 5 minutes before the procedure, and the children were asked to choose the toy they liked. The toy was then placed on the bed or on a hard surface in front of the bed (from the child's perspective). After the child became occupied with the toy, blood collection was performed. During the procedure, the children watched the lights and movement and were allowed to take the toy if they wished.

Control Group

The standard blood collection procedure was applied to the control group. Pharmacological or non-pharmacological methods were not used during blood collection in most hospitals in Turkey. The parents were allowed to stay with the children during the blood draw.

Statistical Analysis

The data were evaluated using Statistical Package for the Social Sciences (IBM SPSS Corp., Armonk, NY, USA) version 22.0. The conformity of the data to normal distribution was examined by Kolmogorov–Smirnov test. Percentage distributions, mean, SD, chi-square, independent samples *t*-test, 1-way analysis of variance analysis were used to analyze the data. The investigator's findings were evaluated at a 95% confidence interval and with a $P < .05$ significance level.

Ethical Considerations

The research was approved by the Gümüşhane University Scientific Research and Publication Ethics Committee (Date: April 27, 2022, Approval number: E-95674917-108.99-92836). The hospital where the research was conducted obtained written permission from the Provincial Health Directorate. The children and their parents were informed about the research; the children gave verbal consent and their parents provided written consent. They were also told that they could withdraw from the study at any time.

RESULTS

Key Participant Characteristics

This study examined age ($P=.914$, $t=0.109$), gender ($P=.355$, $\chi^2=0.855$) and fear of interference ($P=.864$, $\chi^2=0.29$, Table 1) among the children in the experimental and control groups. It was found that the experimental and control groups were similar to each other in regard to the participants' characteristics ($P > .05$) (Table 1).

Table 1 shows the participant characteristics of the families, including mother's age ($P=.167$, $t=1.392$), father's age ($P=.242$, $t=1.176$), mother's education level ($P=.739$, $\chi^2=2.745$), and father's education level ($P=.134$, $\chi^2=7.031$). There was no significant difference between the experimental and control groups in terms of family type ($P=.943$, $\chi^2=0.118$) or income status ($P=.323$, $\chi^2=2.262$) ($P > .05$) (Table 1), so the groups were similar.

Pre-Procedural Anxiety and Pain Level

Table 2 gives a between-groups comparison of the mean scores of the pre-procedural WB-FAS and CFAI filled out by the researcher, parents, and children. No difference was found between the control and experimental groups among any of the 3 evaluators. The pre-procedural WB-FAS and CFAI scores of the groups were similar ($P > .05$). When in-group (child, parent, and researcher) comparisons of WB-FAS and CFAI mean scores of children before the

Table 1. Comparison of the Groups According to the Descriptive Characteristics of the Children and Families' Descriptive Characteristics

Features	Control Group (n=48)	Experimental Group (n=47)	Test and P
	n (%)	n (%)	
Children age (mean \pm SD*)	5.20 \pm 0.71	5.19 \pm 0.79	$t=0.109$.914
Mother age (mean \pm SD*)	32.52 \pm 4.05	33.80 \pm 4.92	$t=1.392$.167
Father age (mean \pm SD*)	36.43 \pm 4.31	37.48 \pm 4.39	$t=1.176$.242
Children gender			
Girl	22 (45.8)	26 (55.3)	$\chi^2=0.855$.355
Male	26 (54.2)	21 (44.7)	
Fear of interference			
Afraid	35 (72.9)	35 (74.5)	$\chi^2=0.29$.864
Not afraid	13 (27.1)	12 (25.5)	
Mother education status			
illiterate	1 (2.0)	1 (2.1)	$\chi^2=2.745$.739
Primary school	0 (00.0)	1 (2.1)	
Middle school/ high school	23 (48.0)	26 (55.4)	
University	24 (50.0)	19 (40.4)	
Father education status			
illiterate	1 (2.0)	0 (00.0)	$\chi^2=7.031$.134
Primary school	11 (23.0)	11 (23.3)	
Middle school/ High school	22 (45.8)	30 (63.9)	
University	14 (29.2)	6 (12.8)	
Family type			
Nuclear family	29 (60.4)	30 (63.8)	$\chi^2=0.118$.943
Extended family	19 (39.6)	17 (36.2)	
Income status			
High	37 (77.1)	33 (70.2)	$\chi^2=2.262$.323
Middle	11 (22.9)	12 (25.5)	
Poor	0 (00.0)	2 (4.3)	
Total	48 (100.0)	47 (100.0)	

χ^2 , chi-square test; *t*, independent-samples *t*-test.
*Mean \pm SD.

procedure were examined, it was determined that there was no statistically significant difference ($P > .05$).

During the Procedure, a Lighted, Rotating Musical Toy Reduces Pain

The average repeated WB-FAS scores by the researcher ($P < .001$, $t=4.830$), parent ($P < .001$, $t=5.375$), and child ($P < .001$, $t=4.596$) during the blood collection process in the experimental and control groups were evaluated (Table 3). There was a statistically significant difference between the groups in the scores of all 3 raters ($P < .001$). According to these results, the musical toy reduced pain. When the in-group (child, parent, and researcher) comparisons of the mean WB-FAS scores of the children during the procedure were examined, it was determined that there was no statistically significant difference ($P > .05$).

Table 2. Comparison of Children's Preprocedural WB-FAS and CFAI Mean Scores

Evaluation	Control Group (n = 48)	Experimental Group (n = 47)	Test and P
	Mean ± SD*	Mean ± SD*	
WB-FAS			
Child	2.14 ± 1.16	2.38 ± 1.39	t = 1.336 .370
Parent	2.83 ± 1.13	2.87 ± 1.19	t = 1.036 .871
Researcher	2.68 ± 1.09	2.78 ± 1.06	t = 1.236 .653
Test and P	F: 0.837 .396	F: 0.703 .418	
CFAI			
Child	2.64 ± 1.08	2.67 ± 1.02	t = 1.652 .138
Parent	1.69 ± 0.76	1.64 ± 0.85	t = 0.986 .436
Researcher	1.88 ± 1.62	1.91 ± 1.24	t = 1.016 .583
Test and P	F: 0.738 .409	F: 0.635 .501	

CFAI, Child Fear and Anxiety Inventory; WB-FAS, Wong-Baker Facial Expression Rating Scale; F, analysis of variance; t, independent samples t-test.
*Mean ± SD.

During the Procedure, a Lighted, Rotating Musical Toy Reduces Anxiety

Lighted rotating musical toy reduces anxiety. In the study, the level of anxiety experienced by the children during bloodletting was re-evaluated (using the CFAI) by the researcher ($P < .001$, $t = 4.479$), the parents ($P < .001$, $t = 4.320$), and the children ($P < .001$, $t = 5.007$). A statistically significant difference was found between the experimental and control groups. According to this research, the musical toy reduced anxiety in children ($P < .001$). During the procedure, no statistically significant difference was found when in-group (child, parent, and researcher) comparisons of children's CFAI mean scores were examined ($P > .05$, Table 4).

It is seen that the differences between pre-test and post-test scores in the control group were insignificant at the $P > .05$

Table 3. Comparison of Children's Mean Order of Procedure WB-FAS Scores

Evaluation	Control Group (n = 48)	Experimental Group (n = 47)	Test and P
	Mean ± SD*	Mean ± SD*	
Child	2.81 ± 1.23	1.42 ± 1.05	t = 4.596 < .001
Parent	3.18 ± 1.37	1.19 ± 0.99	t = 5.375 < .001
Researcher	2.89 ± 1.20	1.19 ± 0.87	t = 4.830 < .001
Test and P	F: 0.496 .665	F: 0.592 .587	

F, analysis of variance; t, independent samples t-test.
*Mean ± SD.

Table 4. Comparison of Children's Mean Order of Procedure CFAI Scores

Evaluation	Control Group (n = 48)	Experimental Group (n = 47)	Test and P
	Mean ± SD*	Mean ± SD*	
Child	2.72 ± 1.10	1.21 ± 0.97	t = 5.007 < .001
Parent	3.00 ± 1.11	0.91 ± 0.92	t = 4.320 < .001
Researcher	1.69 ± 0.82	1.12 ± 0.86	t = 4.479 < .001
Test and P	F: 0.632 .428	F: 0.876 .326	

F, analysis of variance; t, independent samples t-test.
*Mean ± SD.

significance level, according to the evaluations of themselves, their parents, and the researcher in terms of WB-FAS and CFAI before and during the bloodletting process. This finding shows that the children in the control group did not differ in their WB-FAS and CFAI pre-test and post-test scores according to the evaluations of themselves, their parents, and the researcher before and after blood collection (Table 5).

According to the evaluations of the children in the experimental group in terms of WB-FAS and CFAI before and during blood collection, it is seen that the differences between WB-FAS and CFAI pre-test and post-test scores are significant in favor of the post-test at $P < .001$ significance level. As a result, it is seen that the children in the experimental group have a decrease in their WB-FAS and CFAI scores according to their own, their parents', and the researcher's evaluations during blood collection (Table 6).

DISCUSSION

This study investigated the effect on pain and anxiety of providing a lighted, rotating musical toy to children during blood collection in a pediatric blood collection outpatient clinic. The results are discussed and interpreted in light of the literature.

The baseline characteristics of the children (average age, gender, and fear of the procedure) and families (parental age and education level, income status, and family type) in the experimental and control groups were compared, and it was found that the

Table 5. Comparison of Pre-Test and Post-Test Scores of the Children in the Control Group in Terms of WB-FAS and CFAI According to Their Own, Their Parents', and the Researcher's Evaluations

Evaluation		Pre-Test (n = 48)	Post-Test (n = 48)	t	P
		Mean ± SD*	Mean ± SD*		
WB-FAS	Child	2.14 ± 1.16	2.81 ± 1.23	1.891	.321
	Parent	2.83 ± 1.13	3.18 ± 1.37	1.476	.218
	Researcher	2.68 ± 1.09	2.89 ± 1.20	1.512	.182
CFAI	Child	2.64 ± 1.08	2.72 ± 1.10	0.786	.567
	Parent	1.69 ± 0.76	3.00 ± 1.11	0.803	.493
	Researcher	1.88 ± 1.62	1.69 ± 0.82	0.695	.506

CFAI, Child Fear and Anxiety Inventory; WB-FAS, Wong-Baker Facial Expression Rating Scale.
*Mean ± SD.

Table 6. Comparison of Pre-test and Post-Test Scores of the Children in the Experimental Group in Terms of WB-FAS and CFAI According to Their Own, Their Parents', and the Researcher's Evaluations

Evaluation		Pre-test	Post-test	t	P
		(n=47)	(n=47)		
		Mean ± SD*	Mean ± SD*		
WB-FAS	Child	2.38 ± 1.39	1.42 ± 1.05	6.756	<.001
	Parent	2.87 ± 1.19	1.19 ± 0.99	7.812	<.001
	Researcher	2.78 ± 1.06	1.19 ± 0.87	6.456	<.001
CFAI	Child	2.67 ± 1.02	1.21 ± 0.97	7.348	<.001
	Parent	1.64 ± 0.85	0.91 ± 0.92	6.723	<.001
	Researcher	1.91 ± 1.24	1.12 ± 0.86	6.498	<.001

CFAI, Child Fear and Anxiety Inventory; WB-FAS, Wong-Baker Facial Expression Rating Scale.

*Mean ± SD.

groups were similar in these respects. The similarity of the groups according to these variables was important in confirming that the musical toy provided during the bloodletting affected the children's pain and anxiety levels.

Before the blood draw, the levels of pain and anxiety in the control and experimental groups were evaluated by the researcher, parents, and children, and the evaluation showed that the levels were similar in the 2 groups. The similarity of the pain and anxiety levels in the control and experimental groups before the procedure supported the ability to measure the effectiveness of the toy.

In this study, the researcher, parents, and children evaluated the children's pain during the blood collection process using the musical toy, and the average scores were calculated. The pain scores of the children in the control group were found to be significantly higher than those of the children in the experimental group. This result supports H₁: "Implementing the toy distraction method during child blood collection reduces pain in children." Our results support similar studies in the literature, such as one that determined that letting preschool children inflate balloons as a distraction during blood collection reduced pain.²⁶ In another study, Koç-Özkan and Polat²⁷ used virtual reality and a kaleidoscope method to distract children aged 4-10 during blood collection. The pain level of the children in the control group was found to be higher than in the virtual reality and kaleidoscope group. A study of 191 children aged 3-13 in an emergency department found that the level of pain decreased in children who listened to music in the experimental group,¹¹ and the pain level of children who watched animated cartoons for visual and auditory distraction during vascular access was found to be significantly lower than in the other groups.²⁸ A study by Ullán et al¹⁹ examined the effect of a plush toy for distraction in reducing postoperative pain, and the pain level was found to be lower than in the control group. It has been determined that the digital technology distraction (e.g., virtual reality or a video game) of children of diverse age groups reduces moderate pain during intravenous procedures.²⁹

The children's anxiety level was evaluated by the researcher, parents, and children during blood collection in our study, and the anxiety scores of the children in the experimental group were found to be significantly lower than those in the control group. This result supports H₂: "Implementing the toy distraction method during child blood collection reduces anxiety in children."

Our research supports similar studies in the literature. A study by Lilik et al²⁶ found that letting preschool children wear cartoon-patterned clothing and blow up balloons as distraction during blood collection reduced their level of anxiety. Da Silva et al¹⁷ found that the use of a therapeutic toy among 3- to 6-year-old children during bloodletting reduced their anxiety. In a study examining the level of anxiety in preschool children before surgery, a distracting game reduced anxiety.³⁰ Other studies have also found that distraction during blood draws reduces anxiety in children.^{31,32}

Our research found that the musical toy reduced preschool children's pain and anxiety during blood collection. The mean pain and anxiety scores of the children in the experimental group were found to be significantly lower than those of the children in the control group.

This research found that the use of a musical toy during blood collection effectively reduced pain and anxiety. This research can be replicated in the future in randomized controlled studies in diverse age groups or in different intravenous applications, such as peripheral vascular access.

Implications for Nursing Practice

Needle prick procedures, such as venepuncture during blood collection, are the main source of pain and anxiety in children. Therefore, pediatric nurses should manage invasive interventions, such as vascular puncture. In an outpatient clinic, it is valuable to use a lighted, rotating musical toy during the blood collection process for children aged 4-6 years.

Study Limitations

This research was limited by the researcher's knowledge of which group the children were in. To reduce bias, however, the research variable was also evaluated by the children and their parents. Nurses performed routine blood sampling for both groups without any difference. The study findings are limited to preschool children.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Gümüşhane University (Date: April 27, 2022, Number: E-95674917-108.99-92836).

Informed Consent: Written and verbal informed consent was obtained from patients' parents who participated in this study.

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