Medical Journal of Europe

ISSN: 2995-7907 doi: 10.5281/zenodo.10703015

Let me kiss you and make it better! Mother's Kiss as a Secondary Mirroring Applied in Invasive Interventions is Effective in Reducing Pain, Anxiety and Fear in Children: A Randomised Controlled Study

Emre Ciydem [1], Mehmet Yildiz [2], Cengiz Tez [3], Gulnaz Turgay [2]

[1] Department of Mental Health and Psychiatric Nursing, Bandırma Onyedi Eylul University, Faculty of Health Sciences, Bandirma, Balikesir, Türkiye
[2] Istanbul Başakşehir Çam and Sakura City Hospital, Basaksehir, Istanbul, Türkiye
[3] Department of Nursing, Department of Mental Health and Psychiatric Nursing, Bandırma Onyedi Eylul University, Institute of Health Sciences, Bandirma, Balikesir, Türkiye

Article Info

Received: 22 February 2024

Accepted: 24 February 2024

Revised: 25 February 2024

Published: 26 February 2024

Keywords:

Anxiety, evidence-based nursing, fear, mother's kiss, pain management.

Corresponding author:

Emre Ciydem,

Department of Mental Health and Psychiatric Nursing, Bandırma Onyedi Eylul University, Faculty of Health Sciences, Bandirma, Balikesir, Türkiye.

emreciydem@hotmail.com

This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/)

ABSTRACT

The mother's kiss, which can be considered as a secondary mirroring of the idealised parental imago, can be used to overcome painful experiences in children. To examine the effect of mother's kiss as a secondary mirroring during invasive interventions on pain, anxiety and fear levels of children aged 5-7 years. The sample of the study consisted of 84 children between 5-7 years. The maternal kissing group received mother's kiss during invasive intervention, while the control group received standard invasive intervention between 11 January-5 May 2023. The pain level measured at the 5th minute of the children in the maternal kissing group was significantly lower than the control group. The pain level of the children in the maternal kissing group before the procedure was lower than the pain level at the 5th minute and the pain level at the 5th minute was lower than the pain level at the 1st minute. The anxiety level of the children in the maternal kissing group measured at the 1st minute was higher than the control group. The anxiety level of the children in the maternal kissing group at the 5th minute was lower than the anxiety level before the procedure and at the 1st minute. The fear level measured at the 5th minute of the children in the maternal kissing group was significantly lower than the control group. The fear level of the children in the maternal kissing group at the 5th minute was significantly lower than the fear level before the procedure and at the 1st minute. Mother's kiss as a secondary mirroring applied in invasive interventions is effective in reducing pain, anxiety and fear in children.

Cite as: Ciydem E, Yildiz M, Tez C, Turgay G. Let me kiss you and make it better! Mother's Kiss as a Secondary Mirroring Applied in Invasive Interventions is Effective in Reducing Pain, Anxiety and Fear in Children: A Randomised Controlled Study. Med J Eur. 2024;2(2):59-67. doi: 10.5281/zenodo.10703015

INTRODUCTION

It is well-established that 30% of all hospital admissions consist of pediatric patients, often attributed to accidents or diseases (1). During these admissions, children frequently undergo invasive procedures such as intravenous catheterization, bladder catheterization, intramuscular injection, blood sampling, and nasogastric tube insertion. While these interventions constitute the primary sources of pain for children in healthcare settings, they also evoke anxiety and fear (2-4). Procedural pain is often associated with medical procedures in hospitals. Therefore, it is crucial to employ safe and effective interventions for pain management in children. However, deficiencies in the assessment and management of pain, particularly in pediatric services, have been identified (5). Hence, evidence-based non-pharmacological methods should be utilized for pain management in this group (5). Anxiety experienced during painful procedures increases pain awareness due to heightened sympathetic responses. Increased awareness leads to a decreased pain threshold and an intensified experience of pain during invasive procedures (6). Therefore, it is crucial to examine the effect of evidence-based non-pharmacological methods on both pain and anxiety levels. Anxiety is an unexplained feeling of uneasiness in response to

Table 1. Descriptive features and comparison of children in intervention and control groups.

Features	Intervention Group (n:42)		Control Group (n:42)		Test Statistic	
	n	%	n	%	χ^2	p
Gender						
Female	21	50	21	50	1.000	
Male	21	50	21	50		
Age						
5	14	33.3	14	33.3	1.000	
6	14	33.3	14	33.3		
7	14	33.3	14	33.3		
Previous hospitalisation experience of the child						
No	22	52.4	18	42.9	X^{2*}=.764	p=.382
Yes	20	47.6	24	57.1		
Previous exposure of the child to painful medical intervention					1,000	
Yes	42	100	42	100		

real or perceived threats (7), while fear is a biochemical and emotional response preparing an individual mentally and physically against a clear danger (8). In health services, fears are often oriented towards medical interventions or health personnel (9,10). Fears in children may delay or prevent the diagnosis and treatment of diseases. Inadequate management of pain, anxiety, and fear during medical procedures can lead children to perceive these experiences negatively and develop needle phobia towards future invasive procedures (10). Fear of medical procedures developed due to negative hospital experiences in early childhood may persist into adulthood (11,12). To prevent the negative consequences of this fear, evidence on the effects of non-pharmacological methods on the fear of medical procedures is needed (13).

The concept of atraumatic care has emerged to prevent the traumatic effects of invasive interventions in children (14). Atraumatic care is defined as "providing therapeutic care using interventions that reduce the physical and psychological distress of the child and family" (15). In this context, various non-pharmacological methods have been employed to reduce pain, anxiety, and fear associated with invasive interventions in children (5). Non-pharmacological methods include using kaleidoscopes, inflating balloons, watching cartoons, playing video games and toys/puppets, listening to music, using virtual reality glasses, and employing social robots (16-22). Nurses, being the health professionals who spend the most time with sick children and have the opportunity to observe them closely, are in an advantageous position to provide atraumatic care (18). Nurses adopting the philosophy of traumatic care can apply non-pharmacological interventions that minimize or completely eliminate the negative effects of invasive interventions in children, aligning with their independent roles (23). However, it is noted that these interventions are not widely used by health professionals due to perceived costs, time constraints, or complexity (24). Therefore, the search for non-pharmacological methods with low side effects, cost-effectiveness, attractiveness, ease of use, and reusability in clinical practice continues (2).

Table 2. Intragroup and intergroup comparison of pain level means of children in intervention and control groups.

Time (min)	Intervention Group (n:42) ($\bar{x}$ ±SD)	Control Group (n:42) ($\bar{x}$ ±SD)	Test Statistic	p
Pre-procedure[1]	0	0		
1st minute[2]	4.26 ± 1.06	4.09 ± 1.05	t= 0.722	0.472
5th minute[3]	1.47 ± 1.04	3.02 ± 0.94	t= -7.116	**<0.001**
Test Statistic	F=363.172	F=612.848		
p	**< .001 (1<3<2)**	**< .001 (1<3<2)**		

t: Independent groups t test Independent groups t test. F: Repeated measures analysis of variance.

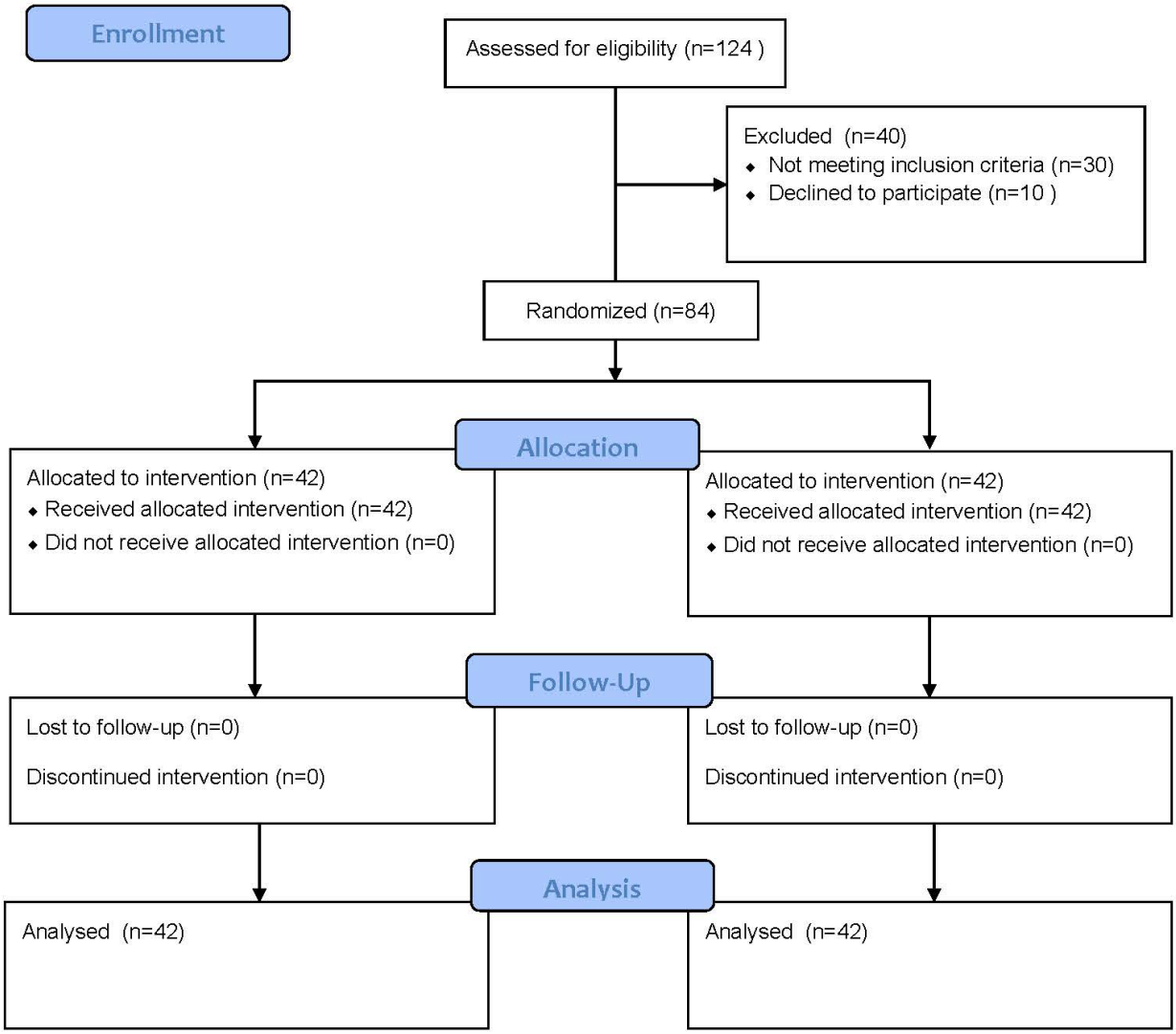

Figure 1. CONSORT Flow Diagram of the Research.

Mother's kiss, as a practice with the mentioned characteristics, has been frequently used by health professionals and the public for minor injuries occurring in early childhood. The mother's kiss, a secondary mirroring of the idealized parental imago, can be used to overcome painful experiences in children. In daily life, when children occasionally trip and fall on the carpet, when they are ridiculed and ostracized by their friends, or when they feel devalued, they look for a safe haven to entrust their omnipotent power to, which is typically the mother and father (25, 26). "Mum, it's a blow, kiss it and it will pass!" they say. Since the omnipotent power of the mother is perceived as capable of melting away all troubles with a kiss, children seek comfort in this gesture. The mother kisses the place where pain and suffering are felt, and it miraculously passes. This situation is a form of secondary mirroring, where power attributed to another is sincerely accepted, creating a sense of "I am the most important person in the world, and you are a part of me" (25, 26). Human beings inherently seek protection and support from robust self-objects when faced with situations that surpass their competence. In self-psychology, the concept of secondary mirroring is defined as the provision of protection and support by a strong self-object during times of stress or tension that exceed the child's capabilities. Through the secondary mirroring from the idealized parental imago, children acquire the ability to manage conflicts, impulses, and self-soothe in situations of tension (25-27). Exploring the effects of secondary mirroring provided by the idealized parental imago in alleviating negative emotions such as pain, anxiety, and fear experienced during invasive procedures—stressful experiences for children—may pave the way for a new, easily applicable, cost-effective, and non-invasive method. The parent's capacity to regulate the negative emotions experienced by the child without succumbing to panic in the face of a stressful situation may facilitate the child's ability to more effectively alleviate the sensation of pain and negative emotions associated with pain. There are no studies testing the effectiveness of the traditional mother's kiss. Therefore, to better understand the value of the mother's kiss (if any) in invasive interventions, this study aimed to examine its effect as a secondary mirroring of the idealized parental imago on children's pain, anxiety, and fear levels.

Table 3. Intragroup and intergroup comparison of fear level means of children in intervention and control groups.

Time (min)	Intervention Group (n:42) $\bar{x}$ ±SS	Control Group (n:42) $\bar{x}$ ±SS	Test Statistic	p
Pre-procedure[1]	2.97 ± 1.07	3.40 ± 0.88	t=-2.0	**0.049**
1st minute[2]	2.76 ± 1.22	2.95 ± 1.24	t= 81.973	0.483
5th minute[3]	0.64 ± 0.79	1.57 ± 1.10	t= -4.422	**<0.001**
Test Statistic	F=287.464	F=315.791		
p	**< .001 (3<2.1)**	**< .001 (3<2<1)**		

t: Independent groups t test Independent groups t test, F: Repeated measures analysis of variance.

METHODS

Design

The design of this study was a randomised controlled experimental study with a single blind pre-test post-test control group. The study was conducted according to CONSORT guidelines. Clinical Trials code of the Study is NCT05892601 (Effect of Maternal Kisses on Pain, Anxiety, and Fear, https://classic.clinicaltrials.gov/ct2/show/NCT05892601).

Hypotheses

$H0_1$: Mother's kiss during invasive intervention has no effect on pain.

$H1_1$: Mother's kiss during invasive intervention has an effect on pain.

$H0_2$: Mother's kiss during invasive intervention has no effect on anxiety.

$H1_2$: Mother's kiss during invasive intervention has an effect on anxiety.

$H0_3$: Mother's kiss during invasive intervention has no effect on fear.

$H1_3$: Mother's kiss during invasive intervention has an effect on fear.

Population and Sample

The population of the study consisted of 124 children aged 5-7 years who applied to a private pediatric gastroenterology clinic for diagnosis and treatment between 11 January 2023 and 5 May 2023, and the sample consisted of 84 children. The minimum sample size was calculated with GPower 3.1 Statistical Software. Since the effect size could not be determined in a similar study, a pilot study was conducted with a total of 10 people, five people per group in the maternal kissing and control groups. Pilot applications were not included in the study afterwards. In line with the data obtained from the pilot study, the effect size calculated using the mean and standard deviation of the fear level scores of the children in the maternal kissing and control groups at the 5th minute was d:0.73. Accordingly, for an effect size of d:0.73, α:0.05 and 1-β:0.95, the number of people to be sampled within each group was determined as 42 and 84 in total. The study was completed with a total of 84 participants. As a result of the PostHoc power analysis performed after the data were collected, the power of the test was determined as 99.9% with 95% confidence (1-α), d=0.97 effect size and n=84 participants (28). The effect size used in the PostHoc analysis was calculated by using the mean and standard deviation of the fear level scores of the children in the maternal kissing and control groups at the 5th minute.

Inclusion Criteria (Mother)

* Being over 18 years of age

* Speaking Turkish

* Having two lips with which to apply the kiss

* Written informed consent

Exclusion Criteria (Mother)

* Having oral ulcers

* Accused or convicted of child abuse or neglect

Inclusion Criteria (Child)

* Being in the age range of 5-7 years

* Admission to pediatric gastroenterology clinic for diagnosis and treatment

* Stable general condition

* Invasive intervention performed in a single attempt

* Not having visual and hearing problems

* Not having any pain (due to illness, side effects of medication, distension)

* Not having a chronic disease (kidney, diabetes, etc.) that requires frequent invasive intervention

* Being at the level of mental development to answer the questions asked

* Speaking and understanding Turkish easily

* Volunteering to participate in the study

Table 4. Intragroup and intergroup comparison of anxiety level means of children in intervention and control groups.

Time (min)	Intervention Group (n:42) $\bar{x}$ ±SS	Control Group (n:42) $\bar{x}$ ±SS	Test Statistic	p
Pre-procedure[1]	7.19 ± 2.32	7.02 ± 2.66	t=0.305	0.761
1st minute[2]	7.61 ± 2.40	5.09 ± 2.65	t= 82	**<0.001**
5th minute[3]	2.45 ± 1.59	2.42 ± 1.43	t= 82	0.943
Test Statistic	F=448.476	F=234.753		
p	**< .001 (3<2.1)**	**< .001 (3<2<1)**		

t: Independent groups t test Independent groups t test. F: Repeated measures analysis of variance.

Exclusion Criteria (Child)

* Having a history of epilepsy, vertigo and neurological diseases

* History of syncope during blood collection

* Having a disease that causes chronic pain

* Complications during invasive intervention (allergy, syncope, etc.)

* Being in life-threatening condition and taken to the resuscitation room

* Deciding that the child is a forensic case after the examination

* In the maternal kissing group, the parent makes an intervention other than kissing the child within 5 minutes

* In the control group, the parent makes any intervention to his/her child within 5 minutes

Randomisation and Blinding

Stratified block randomisation method was used to assign the participants to the maternal kissing and control groups. To prevent bias, randomisation was performed by an unbiased nurse who was not involved in the study. In order to control the imbalances that may arise between the maternal kissing and control groups, stratification (2X2) was made according to gender (girls, boys) and age (5,6,7) and an equal number of children were assigned to each group (blocking). Assignments were made according to a list generated by an online randomisation tool (29). All participants completed the study process and there was no case loss. The parents of the children who participated in the study were unaware of which group their children were in. Since the applications were carried out by the researcher, researcher blinding could not be performed. Therefore, the study is single blind. The CONSORT (2010) flowchart of the study is shown in Figure 1.

Data Collection Tools

Questionnaire Form

The form prepared by the researchers in line with the literature (30,31) includes 4 questions about the child.

The Wong-Baker Pain FACES Scale

The scale developed by Wong and Baker to determine the level of pain experienced by children over the age of three (32). The scale has 6 different facial expressions scored between 0 and 5. A smiley face indicates no pain, a tearful face indicates unbearable pain. The meaning of facial expressions is explained to the child. He/she is then asked to show the face that best expresses the level of pain at the time of the question. The number in the facial expression indicated by the child is recorded. As the score obtained from the scale increases, pain tolerance decreases (32).

State Anxiety Inventory (STAI)

It was developed by Kleiber & McCarthy to assess the child's anxiety in painful procedures (33). The STAI is shaped like a thermometer with a bulb at the bottom and horizontal lines at intervals going upwards. The scale can be used for children over the age of four. To determine the child's anxiety level, "Imagine that all your anxious or nervous feelings are in the bulb or bottom part of the thermometer. If you are a little worried or tense, emotions may go up a little on the thermometer. If you are very, very anxious or tense, emotions can go all the way to the top. The instruction “Put a line on the thermometer to show how anxious or irritable you are” is given (33). To measure state anxiety, the child is asked to tick how he/she is feeling at the moment (33,34). A transparent meter is placed over the child's rating on which ½ point increments are marked, then the ½ point increment is rounded up to the nearest number. The points that can be obtained vary between 0-10 (34). The Turkish validity and reliability conducted by Gerçeker et al. (35).

Children's Fear Scale (CFS)

The scale developed by McMurtry et al. (2011) to measure the fear levels of children aged 4-10 years (36). The scale translated into Turkish by Gerçeker et al. (2018) (35). The validity index of the scale was found to be 0.89. The CFS includes five different drawn facial expressions ranging from neutral expression (0=no fear) to frightened face (4=severe fear). The scale is scored between 0-4. The scale can be used by families and/or researchers to assess fear before and during the procedure (35). In this study, the scale was scored by the nurse who performed the application.

Procedure

After obtaining the necessary permissions, the data were collected by the researcher through face-to-face interviews. The eligibility of the children and their parents who were admitted to the pediatric gastroenterology clinic and decided to undergo invasive intervention after examination were evaluated. Then, the verbal consent of the children who volunteered to participate in the study and met the inclusion criteria and the written consent of the mothers were obtained. Stratified randomisation method was used to assign the children to the groups. Then, according to the type of intervention to be applied, the child and the parent were included in the relevant section. Blood collection and observation rooms, where invasive interventions are performed, are separated by a screen for one person and designed to protect privacy. All data collection tools except the pain scale were administered to the children in the maternal kissing and control groups as pretest. Mother's kiss was applied to the maternal kissing group. The control group underwent invasive intervention with the standard method. Before the application, it was checked whether the parents had oral ulcers. The parents of the children in the maternal kissing group were informed about the process before the application. Immediately after the invasive procedure was finished, the parent was asked to approach his/her child and say, "Let me kiss you and make it better" and to kiss his/her child from a point not close to where the invasive procedure was performed. Kisses were delivered by mother, free of oral ulcers, with a standard 5-second pressing of both lips on the affected body part followed by an exaggerated puckering sound. Pain, fear and anxiety scales were re-administered to both groups at the 1st and 5th minutes after the application. Invasive interventions were performed by the researchers who had been working as nurses for 4 years and by the medical doctor. The same procedures were repeated for each child who met the inclusion criteria. The parents of the children in the control group remained in the same environment with their child during the invasive intervention. After the application process was completed, the children in the control group were also provided with the mother's kiss application.

Data Analysis

Statistical Package for Social Sciences (SPSS) (23.0) used to evaluate the data. Shapiro-Wilk test was used to examine normal distribution. Chi-square test was used to determine homogeneity in categorical variables. Since the data were normally distributed, dependent samples t test was used for intra-group comparisons and independent samples t test was used for inter-group comparisons. The significance was $p<0.05$.

RESULTS

Profile of Participants

52.4% (n=22) of the children in the maternal kissing group and 42.9% (n=18) of the children in the control group had no previous hospitalisation experience. All children (n=42) in the maternal kissing and control groups had been exposed to painful medical intervention before. The children in the maternal kissing and control groups did not differ significantly in terms of age, gender, previous hospitalisation experience and exposure to painful medical intervention and the groups were homogenously distributed ($p>.05$) (Table 1).

Intragroup and Intergroup Comparison of Mean Pain, Fear and Anxiety Levels of Children in Maternal Kissing and Control Groups

When intra-group comparisons were analysed, the pain level of the children in the maternal kissing group before the procedure (0) was significantly lower than the pain level at the 5th minute (1.47 ± 1.04) and the pain level at the 5th minute was significantly lower than the pain level at the 1st minute (4.26 ± 1.06) ($p< .001$) (Table 2). The pre-procedure pain level (0) was significantly lower than the pain level at the 5th minute (3.02 ± 0.94) and the pain level at the 5th minute was significantly lower than the pain level at the 1st minute (4.09 ± 1.05) in the control group ($p< .001$) (Table 2).

When intergroup comparisons were analysed, no significant difference was found between the maternal kissing and control groups in terms of pain levels measured before the procedure and at the 1st minute ($p>.05$) (Table 2). The pain level measured at the 5th minute (1.47 ± 1.04) of the children in the maternal kissing group was significantly lower than the control group (3.02 ± 0.94) ($p< .001$) (Table 2).

When the intra-group comparisons were analysed, the fear level of the children in the maternal kissing group at the 5th minute (0.64 ± 0.79) was significantly lower than the fear level before the procedure (2.97 ± 1.07) and at the 1st minute (2.76 ± 1.22) ($p< .001$) (Table 3). The fear level of the children in the control group at the 5th minute (1.57 ± 1.10) was significantly lower than that at the 1st minute (2.95 ± 1.24), and the fear level at the 1st minute was significantly lower than that before the procedure (3.40 ± 0.88) ($p< .001$) (Table 3).

When intergroup comparisons were analysed, the fear level measured at the 1th minute (2.97 ± 1.07) of the children in the maternal kissing group was significantly lower than the control group (3.40 ± 0.88) ($p = .049$). No significant difference was found between the maternal kissing and control groups in terms of fear levels measured at the 1st minute ($p>.05$) (Table 3). The fear level measured at the 5th minute (0.64 ± 0.79) of the children in the maternal kissing group was significantly lower than the control group (1.57 ± 1.10) ($p< .001$) (Table 3).

When intra-group comparisons were analysed, it was determined that the anxiety level of the children in the maternal kissing group at the 5th minute (2.45 ± 1.59) was significantly lower than the anxiety level before the procedure (7.19 ± 2.32) and at the 1st minute (7.61 ± 2.40) ($p< .001$) (Table 4). It was determined that the anxiety level of the children in the control group at the 5th minute (2.42 ± 1.43) was significantly lower than that at the 1st minute (5.09 ± 2.65), and the anxiety level at the 1st minute was significantly lower than that before the procedure (7.02 ± 2.66) ($p< .001$) (Table 4).

When intergroup comparisons were analysed, no significant difference was found between the maternal kissing and control groups in terms of anxiety levels measured before the procedure

and at the 5th minute (p>.05) (Table 4). The anxiety level of the children in the maternal kissing group measured at the 1st minute (7.61 ± 2.40) was significantly higher than that of the control group (5.09 ± 2.65) (p< .001) (Table 4).

DISCUSSION

The pain level measured at the 5th minute was significantly lower in the maternal kissing group compared to the control group. In addition, the pain level of the children in the maternal kissing group before the procedure was lower than the pain level at the 5th minute and the pain level at the 5th minute was lower than the pain level at 1 minute. In addition, the pain level of the children in the control group before the procedure was lower than the pain level at the 5th minute and the pain level at the 5th minute was lower than the pain level at 1 minute. In line with these results, hypothesis $H1_1$ was accepted. Accordingly, in this study, in which children who did not have pain before the procedure were included, it was determined that the mother's kiss was effective in reducing the pain level of children related to invasive intervention. In the existing literature, it has been observed that diverse interventions, including listening to music, virtual reality, cold application, vibration application, distraction cards, kaleidoscope, and watching videos, which engage the senses of sight, hearing, touch, and smell, effectively alleviate pain during invasive procedures in children across various age groups (18,35). While it is a common practice during childhood for mothers to kiss the site of minor injuries, the effectiveness of this approach in alleviating pain has not been conclusively demonstrated. The absence of studies specifically investigating the impact of a mother's kiss on pain makes it challenging to assess the outcomes of this study. Moreover, findings from studies comparing the effectiveness of various methods against each other also show inconsistencies (37,38). Discrepancies in the findings of prior studies may be attributed to the multifaceted and intricate nature of pain. Indeed, pain is influenced by numerous individual, sociocultural, and environmental factors (6). Based on the results of the current study, it is hypothesized that a mother's kiss, serving as a secondary mirroring of the idealized parental imago and functioning as one of the distraction techniques, diminishes pain sensitivity and enhances pain tolerance in children. This is achieved by redirecting their attention toward a stimulus other than the pain during invasive procedures (2,39). Another potential explanation for this result can be illuminated by the concept of secondary mirroring provided by the idealized parental imago. Human beings often seek protection and support from robust self-objects in situations that surpass their competence (27). In self-psychology, secondary mirroring is defined as the child being protected and supported by a strong self-object during times of stress or tension that exceed the child's capabilities. Through the secondary mirroring from the idealized parental imago, children develop the capacity to manage conflict, impulses, and self-soothe in stressful situations (27). Therefore, the observed result may be attributed to the regulation of negative emotions associated with pain during invasive procedures, which can be a stressful experience for the child, facilitated by the idealized parental imago. In essence, the parent's skill in regulating the child's negative emotions without succumbing to panic in the face of a stressful situation might have contributed to the child's enhanced ability to regulate negative emotions related to pain and the sensation of pain more effectively. This result shows that the use of mother's kiss as a secondary mirroring of the idealised parental imago, which has been proven to be effective in pain management during invasive procedures, will contribute to the prevention of traumatic effects of medical procedures in children. The effects of traumatic painful experiences in childhood continue throughout life. Such experiences can lead to increased pain reaction and avoidance of medical procedures in adults (40,41).

The anxiety level of the children in the maternal kissing group measured at the 1st minute was higher than the control group. In addition, the anxiety level of the children in the maternal kissing group at the 5th minute was lower than the anxiety level before the procedure and at the 1st minute. The anxiety level of the children in the control group at the 5th minute was lower than that at the 1st minute and the anxiety level at the 1st minute was lower than that before the procedure. In line with these results, hypothesis $H1_2$ was accepted. Accordingly, it can be said that mother's kiss is effective in reducing children's anxiety level. There are studies indicating that diverse interventions such as the use of kaleidoscopes, virtual reality goggles, listening to music, and watching videos have proven effective in reducing not only pain but also anxiety during invasive procedures in children (37,42). Anxiety stands out as one of the most prevalent emotions experienced by children undergoing invasive procedures. It is emphasized that an elevated level of anxiety is a contributing factor that adversely influences pain perception and heightens pain awareness. The heightened pain awareness, in turn, results in a reduction of the pain threshold and an increase in the perceived pain during invasive procedures (2,6,43). Despite the maternal kissing group exhibiting a higher level of anxiety than the control group in the first minute following the procedure, this difference became nonsignificant by the fifth minute. Additionally, the maternal kissing group displayed a more substantial reduction in anxiety over time compared to the control group. This suggests that a mother's kiss, serving as a secondary mirroring technique during invasive procedures, may have effectively diverted the child's attention, leading to a decrease in anxiety and pain associated with these procedures. This result might also be attributed to the secondary mirroring provided by the parent. The parent's regulation of pain-related anxiety in the first minute, presented to the child through a strong parental imago, could have contributed to a reduction in the children's anxiety levels. However, it was noted that the anxiety experienced by children in the control group significantly decreased after the procedure. This could be attributed to the fact that, in the current study, parents were permitted to stay with their children during the implementation period. Studies indicate that the mere presence of a parent without any specific intervention can contribute to a reduction in the anxiety levels of children (19,44).

The fear level of the children in the maternal kissing group measured at the 5th minute was significantly lower than the control group. In addition, the fear level of the children in the maternal kissing group at the 5th minute was significantly lower than the fear level before the procedure and at the 1st

minute. In addition, the fear level of the children in the control group at the 5th minute was significantly lower than that at the 1st minute, and the fear level at the 1st minute was significantly lower than that before the procedure. The fear level measured at the 1th minute of the children in the maternal kissing group was significantly lower than the control group. In line with these results, hypothesis $H1_3$ was accepted. In line with these findings, it can be concluded that a mother's kiss was effective in diminishing children's fear levels. Various studies have demonstrated that certain auditory and visual methods, such as listening to music, watching videos, and virtual reality applications during invasive procedures in children, have positive effects on alleviating fear or fear associated with medical procedures (3,31,39). Nevertheless, there is a notable absence of studies examining the impact of tactile methods on fear. The fear of medical procedures poses a significant challenge for both those seeking medical services and the healthcare providers involved (13). The results of the present study revealed that mother's kiss is an effective method in preventing the negative consequences of fear experienced by children or fear of medical procedures. This result might also be attributed to the secondary mirroring provided by the parent. It's possible that the fear associated with pain is regulated by the parent and presented to the child through a strong parental imago, potentially leading to a reduction in the children's fear levels. The results of the study revealed that mother's kiss as a secondary mirroring reduced pain, anxiety and fear during invasive procedures in children aged 5-7 years.

Relevance for clinical practice

In light of these findings, clinicians are encouraged to consider the use of a mother's kiss as a secondary mirroring of the idealized parental imago to alleviate pain, anxiety, and fear in children during invasive interventions. For future research endeavors, it is recommended to conduct similar studies assessing the comparative efficacy of various distraction techniques aimed at reducing pain, anxiety, and fear associated with invasive procedures. Further analysis of the intervention's effectiveness in different age groups is also advised. Future research designs should incorporate placebo-controlled elements to enhance the robustness of the findings. Additionally, conducting studies on the potential psychological effects of a mother's kiss on mothers is suggested. It is crucial to note that the study's results can only be generalized to children aged 5-7 years, and the study's scope is limited to evaluating the effects of a mother's kiss on the child. The potential benefits that mothers may derive from such a practice could not be fully explored due to the study's design.

Conflicts of Interest

The authors declare that they have no conflict of interest.

Financial disclosure

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethics

The study was conducted in accordance with the principles of the Declaration of Helsinki. Ethics committee permission was obtained from Bandırma Onyedi Eylül University Health Sciences Non-Interventional Research Ethics Committee (Date: 18.10.2022, Number:2022-9). Then, permission was obtained from the Dr. Engin Demir Clinic where the study would be conducted.

Acknowledgment

The authors thank the participants who contributed to the research.

REFERENCES

1. Karakas, NM, Ozdemir, B, Kilic, S, Akbulut Ö. Causes of pediatric emergency department applications of parents: 4 years follow-up. Osmangazi Journal of Medicine. 2020;42(1):67-74. https://doi.org/10.20515/otd.472672
2. Birnie KA, Noel M, Chambers CT, Uman LS, Parker JA. Psychological interventions for needle-related procedural pain and distress in children and adolescents. Cochrane Database Syst Rev. 2018;10(10):CD005179. doi: 10.1002/14651858.CD005179.pub4.
3. Çelikol Ş, Tural Büyük E, Yıldızlar O. Children's pain, fear, and anxiety during invasive procedures. Nurs Sci Q. 2019;32(3):226-232. doi: 10.1177/0894318419845391.
4. Özalp Gerçeker G, Ayar D, Özdemir EZ, Bektaş M. Effects of virtual reality on pain, fear and anxiety during blood draw in children aged 5-12 years old: A randomised controlled study. J Clin Nurs. 2020;29(7-8):1151-1161. doi: 10.1111/jocn.15173.
5. Ali S, McGrath T, Drendel AL. An evidence-based approach to minimizing acute procedural pain in the emergency department and beyond. Pediatr Emerg Care. 2016;32(1):36-44. doi:10.1097/PEC.0000000000000669
6. ENA clinical practice guideline committee; ENA board of directors liaisons:; Methodologist:; Staff liaisons:; Administrative staff:. Clinical practice guideline: Needle-related or minor procedural pain in pediatric patients. J Emerg Nurs. 2019;45(4):437.e1-437.e32. doi: 10.1016/j.jen.2019.05.015.
7. Adwas, AA, Jbireal, JM, Azab, AE. Anxiety: Insights into signs, symptoms, etiology, pathophysiology, and treatment. East African Scholars Journal of Medical Sciences. 2019;2(10):580-591.
8. LeDoux JE. Coming to terms with fear. Proc Natl Acad Sci U S A. 2014;111(8):2871-2878. doi: 10.1073/pnas.1400335111.
9. Broome ME, Hellier A, Wilson T, Dale S, Glanville C. (1988). Development and testing of an instrument to measure children's fears of medical experiences. In Measurement of Clinical and Educational Outcomes in Nursing. CF Waltz, OL Strickland (Eds.), New York. Springer Publishers, 1988; p. 201–214.
10. Orenius T, LicPsych, Säilä H, Mikola K, Ristolainen L. Fear of injections and needle phobia among children and adolescents: An overview of psychological, behavioral, and contextual factors. SAGE Open Nurs. 2018;4:2377960818759442. doi: 10.1177/2377960818759442.
11. Cura ŞÜ, Oğul T, & Kurt, FY. Pediatrik yaş gruplarında akut ağrının giderilmesinde kullanılan tamamlayıcı ve alternatif tıp uygulamaları. Zeynep Kamil Tıp Bülteni. 2018;49(1):126–129. http://dx.doi.org/10.16948/zktipb.303625
12. McMurtry CM, Pillai Riddell R, Taddio A, et al. Far From "Just a Poke": Common painful needle procedures and the development of needle fear. Clin J Pain. 2015;31(10 Suppl):S3-S11. doi: 10.1097/AJP.0000000000000272.

13. Kılıç A, Brown A, Aras I, et al. Using virtual technology for fear of medical procedures: A systematic review of the effectiveness of virtual reality-based interventions. Ann Behav Med. 2021;55(11):1062-1079. doi: 10.1093/abm/kaab016.

14. Doğan, P, Didişen, NA, Yılmaz, HB. Pediatri hemşireliğinde önemli bir girişim: atravmatik bakım ve yaklaşımları. İzmir Kâtip Çelebi Üniversitesi Sağlık Bilimleri Fakültesi Dergisi. 2021;6(2):131-135.

15. Furdon SA, Pfeil VC, Snow K. Operationalizing donna wong's principle of atraumatic care: pain management protocol in the NICU. Pediatr Nurs. 1998;24(4):336-342.

16. Arıkan A, Esenay FI. Active and passive distraction interventions in a pediatric emergency department to reduce the pain and anxiety during venous blood sampling: A randomized clinical trial. J Emerg Nurs. 2020;46(6):779-790. doi:10.1016/j.jen.2020.05.004

17. Eijlers R, Utens EMWJ, Staals LM, et al. Systematic review and meta-analysis of virtual reality in pediatrics: Effects on pain and anxiety. Anesth Analg. 2019;129(5):1344-1353. doi: 10.1213/ANE.0000000000004165.

18. Erdogan B, Aytekin Ozdemir A. The effect of three different methods on venipuncture pain and anxiety in children: Distraction cards, virtual reality, and buzzy® (Randomized Controlled Trial). J Pediatr Nurs. 2021;58:e54-e62. doi: 10.1016/j.pedn.2021.01.001.

19. Inan G, Inal S. The impact of 3 different distraction techniques on the pain and anxiety levels of children during venipuncture: A clinical trial. Clin J Pain. 2019;35(2):140-147. doi: 10.1097/AJP.0000000000000666.

20. Reid-Searl, K, Quinney, L, Dwyer, T, Vieth, L, Nancarrow, L, Walker, B. Puppets in an acute paediatric unit: Nurse's experiences. Collegian. 2017;24(5):441-447. https://doi.org/10.1016/j.colegn.2016.09.005

21. Rossi, S, Larafa, M, Ruocco, M. Emotional and behavioural distraction by a social robot for children anxiety reduction during vaccination. International Journal of Social Robotics. 2020;12:765-777. https://doi.org/10.1007/s12369-019-00616-w

22. Sahiner NC, Bal MD. The effects of three different distraction methods on pain and anxiety in children. J Child Health Care. 2016;20(3):277-285. doi: 10.1177/1367493515587062.

23. Çalışır, H, Karataş, P. Pediatri hemşireliğinde atravmatik bakım yaklaşımı: Ağrı, stres ve anksiyeteyi azaltmada farmakolojik olmayan uygulamalar. Koç Üniversitesi Hemşirelikte Eğitim ve Araştırma Dergisi. 2019;16(3):234–245. http://doi.org/10.5222/HEAD.2019.234

24. Ballard A, Khadra C, Adler S, Trottier ED, Le May S. Efficacy of the buzzy device for pain management during needle-related procedures: a systematic review and meta-analysis. Clin J Pain. 2019;35(6):532-543. doi: 10.1097/AJP.0000000000000690.

25. Kohut H. Forms and transformations of narcissism. J Am Psychoanal Assoc. 1966;14(2):243-272. doi: 10.1177/000306516601400201.

26. Özakkaş T, Çorak A. Narsisizm ve terapisi: Kendilik psikolojisi ve diğer yaklaşımlar, 11.BPT Nisan 2013 ders notları (1st edition). Psikoterapi Enstitüsü Eğitim Yayınları, İstanbul, 2014.

27. Gill, M. M. Heinz Kohut's self psychology. In Progress in Self Psychology,2013 V. 10 (pp. 197-212). Routledge.

28. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-191. doi: 10.3758/bf03193146.

29. Sealed Envelope Ltd. (2021). Create a blocked randomisation list. (Online). Available from https://www.sealedenvelope.com/simple-randomiser/v1/lists

30. Chad R, Emaan S, Jillian O. Effect of virtual reality headset for pediatric fear and pain distraction during immunization. Pain Manag. 2018;8(3):175-179. doi: 10.2217/pmt-2017-0040.

31. Wang Y, Guo L, Xiong X. Effects of Virtual Reality-Based Distraction of Pain, Fear, and Anxiety During Needle-Related Procedures in Children and Adolescents. Front Psychol. 2022;13:842847. doi: 10.3389/fpsyg.2022.842847.

32. Wong DL, Baker CM. Pain in children: comparison of assessment scales. Pediatr Nurs. 1988;14(1):9-17.

33. Kleiber C, McCarthy AM. Evaluating instruments for a study on children's responses to a painful procedure when parents are distraction coaches. J Pediatr Nurs. 2006;21(2):99-107. doi: 10.1016/j.pedn.2005.06.008.

34. Ersig AL, Kleiber C, McCarthy AM, Hanrahan K. Validation of a clinically useful measure of children's state anxiety before medical procedures. J Spec Pediatr Nurs. 2013;18(4):311-319. doi: 10.1111/jspn.12042.

35. Gerçeker, GÖ, Ayar, D, Özdemir, EZ, Bektaş, M. Gaining of children's state anxiety and children's fear scale to turkish language. E- Journal of Dokuz Eylul University Nursing Faculty. 2018;11(9):9-13.

36. McMurtry CM, Noel M, Chambers CT, McGrath PJ. Children's fear during procedural pain: preliminary investigation of the children's fear scale. Health Psychol. 2011;30(6):780-788. doi: 10.1037/a0024817.

37. Özkan, TK. Effects of distraction methods on pain perception and anxiety levels in children during blood collection. Archives of Health Science and Research. 2020;7(3):244-249. https://doi.org/10.5152/ArcHealthSciRes.2020.19042

38. Ghasemi M, Hoseinialiabadi P, Yazdanpanah F, et al. Comparison of music and vapocoolant spray in reducing the pain of venous cannulation in children age 6-12: a randomized clinical trial. BMC Pediatr. 2022;29;22(1):237. doi: 10.1186/s12887-022-03271-9.

39. Le May S, Hupin M, Khadra C, et al. decreasing pain and fear in medical procedures with a pediatric population (DREAM): A pilot randomized within-subject trial. Pain Manag Nurs. 2021;22(2):191-197. doi: 10.1016/j.pmn.2020.10.002.

40. Canbulat N, Inal S, Sönmezer H. Efficacy of distraction methods on procedural pain and anxiety by applying distraction cards and kaleidoscope in children. Asian Nurs Res (Korean Soc Nurs Sci). 2014;8(1):23-28. doi: 10.1016/j.anr.2013.12.001.

41. Gerçeker GÖ, Binay Ş, Bilsin E, Kahraman A, Yılmaz HB. Effects of virtual reality and external cold and vibration on pain in 7- to 12-year-old children during phlebotomy: A randomized controlled Trial. J Perianesth Nurs. 2018;33(6):981-989. doi: 10.1016/j.jopan.2017.12.010.

42. Koç Özkan T, Polat F. The effect of virtual reality and kaleidoscope on pain and anxiety levels during venipuncture in children. J Perianesth Nurs. 2020;35(2):206-211. doi: 10.1016/j.jopan.2019.08.010.

43. McCarthy M, Glick R, Green J, et al. Comfort First: an evaluation of a procedural pain management programme for children with cancer. Psychooncology. 2013;22(4):775-782. doi: 10.1002/pon.3061.

44. Sağlık DS, Çağlar S. The effect of parental presence on pain and anxiety levels during invasive procedures in the pediatric emergency department. J Emerg Nurs. 2019;45(3):278-285. doi: 10.1016/j.jen.2018.07.003.