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SYSTEMATIC REVIEW – OPEN ACCESS

Effect of Therapeutic Play Methods on Hospitalized Children in Turkey: A Systematic Review

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ABSTRACT

Objective: This systematic review aims to examine the effect of therapeutic play methods on hospitalized children in Turkey.

Methods: Medline/PubMed, ScienceDirect, YÖK (higher education institution) National Thesis Center, Ovid, Web of Science, Wiley Online Library, Turkey Clinics, and Google Academic databases were searched for relevant data from 2009–2019 using the keywords therapeutic play, play therapy, child, and pediatrics. Ultimately, 36 studies published in English and Turkish conducted in 2006–2018, which reported the impact of game methods and whose full text can be reached, were included herein. The Preferred Reporting Items for Systematic review and Meta-Analysis Protocols 2015 guideline and Patient, Intervention, Comparison, Outcomes, Study Design model were used in analyzing the studies.

Results: Among the studies included herein, 25 were randomized controlled trials, seven were semi-experimental studies, two were qualitative and quantitative mixed pattern studies, one was a semi-experimental and cross-sectional study, and one was a case–control study. Our findings showed that distraction cards have been the most frequently used therapeutic game method, with durations varying between 3 min and 1 h depending on the attempt, and that therapeutic play has mostly been utilized during the bloodletting process. Moreover, our results revealed that therapeutic play generally reduces pain, anxiety, and fear and increases the child's adaptation to the hospital environment.

Conclusion: The present review showed that therapeutic play among hospitalized children in Turkey was effective in relieving pain and anxiety and helped them adapt to the hospital environment. These results suggest that therapeutic play may aid medical personnel during painful procedures and throughout the hospitalization process.

Keywords: Therapeutic play, play therapy, child, pediatrics

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INTRODUCTION

Whether planned or urgent, hospitalization is a uncharacteristic undertaking for a child, during which they experience various emotions due to the unknown environment, unfamiliar people, and various frightening equipment. Apart from the effects of the disease, changes in the environment and habits, as well as separation from family members and friends, can lead to stress, particularly during painful procedures. Moreover, studies have shown that behavioral disorders and depression are frequently encountered, especially during long-term hospitalizations (1).

To reduce the negative effects of hospitalization, the child and family should prepare for this process, the aim of which should be to establish a trusting relationship, provide information about procedures, help express emotions, and teach and support coping strategies. Previous experiences of the child and family should also be considered to establish communication appropriate for the age of the child, answer questions carefully, and eliminate needless worries. Play, which is a vital part of childhood, has been considered a very important element for meeting the needs of hospitalized children (2).

Playing, which comprises all activities that children engage with their own will without external influence, is imperative for child development. Play activities enable children to view things from a different perspective, think creatively, understand their emotions, learn social and moral rules, and develop their physique, expression skills, and vocabulary (3).

Apart from the aforementioned benefits, playing is an important tool for long-term communication with the child. In particular, playing utilized within hospital settings for therapeutic purposes has been termed therapeutic game (4).

Therapeutic play is a playing technique used to reduce trauma among hospitalized children, evaluate their feelings and misunderstandings toward treatments and procedures, and help them develop positive coping methods (5).

Several studies have shown that therapeutic play can help establish a bond and communication with the hospitalized child, the expression of feelings among children, relieve stress and anxiety, and prepare for invasive interventions (6).

Silva and Cabral (7) provided outpatient treatment to seven children and 22 relatives at an oncology hospital in Rio de Janeiro, while a qualitative study demonstrated the benefits of the therapeutic game (8). Another study conducted by Li et al. involving 304 Chinese children found that the play group had lower anxiety and negative emotions (9). The aforementioned studies emphasize the importance of using therapeutic play to alleviate psychological burden among hospitalized children and provide holistic and quality care.

Considering the effects of therapeutic play on communication with hospitalized children and their compliance with hospital procedures, the current review aimed to systematically evaluate evidence regarding the effect of therapeutic play among children hospitalized in Turkey.

This systematic review sought to answer the following questions:

1. Does therapeutic play benefit hospitalized children?
2. Is therapeutic play a useful way of communicating with children to aid in the adaptation process?

METHODS

The systematic review was designed according to the Preferred Reporting Items for Systematic review and Meta-Analysis (PRISMA) checklist (10). The quality assessment process for studies included herein was conducted using the quality assessment lists prepared by the Joanna Briggs Institute. Findings from the included studies are summarized in tabular form (Appendix 1).

To reduce the risk of possible bias in this systematic review, literature scanning, article selection, and data extraction were independently conducted by the researchers.

Screening Strategy

Studies included herein were screened according to the following criteria [i.e., Patient, Intervention, Comparison, Outcomes, Study Design (PICOS) model].

- Study group (P: Patient): Children hospitalized in Turkey
- Intervention (I): Therapeutic play
- Comparison (C): Therapeutic game group versus control group
- Results (O: Outcomes): Adaptation to hospitalization/interventions
- Study design (S): Randomized controlled trials

  Semi-experimental research

  Pre- and post-test controlled studies

  Descriptive research

  Qualitative research

Moreover, the included studies needed to satisfy the following inclusion criteria:

- Published in Turkish and English.
- Studies in Turkish should have been published within the last 10 years
- Included children hospitalized between the ages of 0 and 18.
- Findings should be related to therapeutic play attempts for hospitalized children.
- Full text of the articles should be available.

The following were the exclusion criteria of the studies examined herein:

- Studies including a sample not within 0–18 years old.
- Studies conducted outside the hospital.
- Unavailability of the full text versions of the articles.
- Systematic or traditional reviews.
- Studies included in other databases.

Selection Criteria and Selection of Research

A database search for studies published within the last 10 years was performed, ultimately identifying 36 studies conducted in Turkey and published between 2009 and 2019 that examined therapeutic play experiences among hospitalized children between 0 and 18 years of age, reported the effect of therapeutic play on hospital compliance, and had a full text version available. Our findings have been summarized in Appendix 1. PICOS was used according to the PRISMA checklist.

Initial screening results identified 119 studies, among which 63 were included after excluding repeated studies. After reviewing the title and abstract of each study, another five studies were excluded, leaving 58 studies. Thereafter, the inclusion and exclusion criteria were applied, leaving 53 studies, among which 36 reporting on the effect of therapeutic play among hospitalized children were included in the analysis (Fig. 1).

Data Extraction

The following data were extracted from the studies included using a data collection tool created by the researcher: author and publication year, study design, data collection tool, applied therapeutic method and duration, sample size, year, sample characteristics, and main results (Appendix 1).

Evaluation of Methodological Quality

Studies included herein were evaluated using the quality evaluation lists prepared by the Joanna Briggs Institute according to research design (11). The assessment tool used was selected in accordance with the study design of the study. The control checklists consisted of 13 questions for randomized controlled studies, nine for quasi-experimental research, eight for cross-sectional research, 10 for qualitative research, and 10 for case–control studies. Each question in these lists can be answered by "Yes, No, Uncertain, and Not Applicable." The evaluation of the results for each study are expressed as a "quality score" in Appendix 1.

RESULTS

This review included 36 studies published within the last 10 years that investigated therapeutic play methods among hospitalized or outpatient children. Among the studies included herein, 25 were randomized controlled trials, seven were semi-experimental stud-

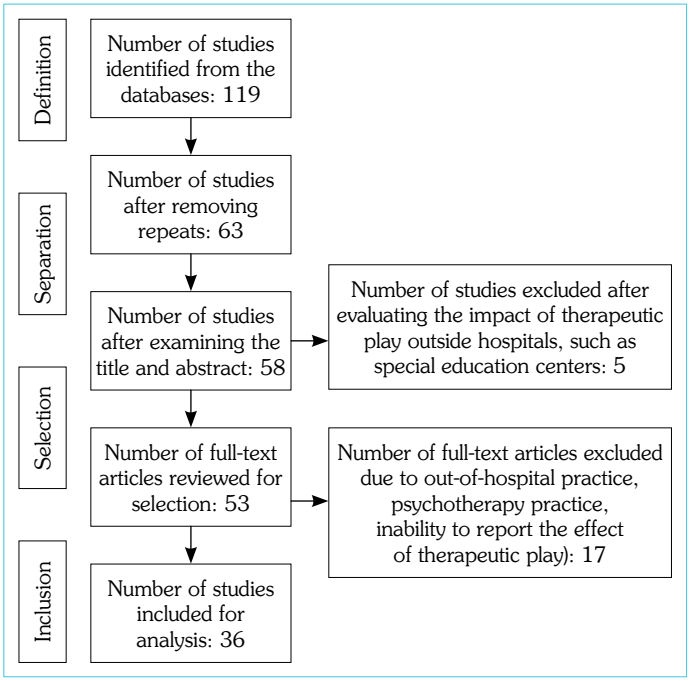

Figure 1. Study selection and inclusion process

ies, two were qualitative and quantitative mixed-design studies, one was a semi-experimental and cross-sectional study, and one was a case–control study.

After examining the studies, the following results were determined:

- Studies had a sample consisted of at least six children and at most 300 children.
- In majority of the studies, data were collected using questionnaires.
- Distraction cards were found to be the most commonly used therapeutic method.
- The duration of the therapeutic game used in the studies ranged from 3 min to 1 h, depending on the duration of the procedure (blood draw, drug administration, vascular access, pre/postoperative).
- Therapeutic play was mostly used during blood collection.
- To reduce the risk of bias and accurately determine the effect of the game, observers rather than practitioners were employed during the process.
- Researchers and nurses who played with the children had been trained.
- Parents were beside their children during invasive procedures, such as blood collection, vascular access, and drug administration. However, parents were excluded in cases wherein therapeutic play-based education was conducted.
- The following tools were used to analyze behaviors: Wong-Baker Pain Scale (12–26), Yale Preoperative Anxiety Scale (27), Piers-Harris Self-Concept Scale for Children (28), State (29) and Continuous Anxiety Scale (26, 30–35), Children's Fear Scale (13, 16, 18, 20–24, 36, 37), Medical Intervention Fear Scale (15, 26, 28, 32, 38), Anxiety Sensitivity Index for Children (15, 36, 37, 39), Visual Comparison Scale (12, 15, 19, 37), Newborn Pain Scale (40), PedsQL Parental Health Care Satisfaction Scale (29, 41), Premature Pain Profile (42), Perceived Stress Scale (43), Re-Mission Video Play (43), Beck Anxiety Scale (33), and Child Anxiety and Pain Scale (44, 45).
- Most of the studies had a sample group between the ages of 6 and 12.
- Included studies were conducted in İstanbul (15, 27, 28, 31, 33, 34, 37, 43–46), Konya (13, 22–24), İzmir (14, 16, 17), Zonguldak (19, 47), Balıkesir (20, 21), Malatya (25), Samsun (26), Edirne (32), Afyon (38), Kocaeli (36), Erzurum (12), Çanakkale (40), and Antakya (41). However, five studies did not specify the city.

The findings obtained from the studies included in the systematic review are outlined in Appendix 1.

DISCUSSION

Hospitalized children and their family are exposed to psychological and physical stress. Moreover, many environmental factors to which the child is exposed promote behavioral changes among children. The present study thus aimed to determine the effects of therapeutic game, a method used to reduce the negative effects of such factors.

Our results showed that studies on therapeutic play as a method for helping children adapt to hospitalization in Turkey have been increasing in recent years. In particular, the fact that most of the studies were randomized controlled trials with a high level of evidence highlights the importance of such a research area (48).

The present systematic review included four studies that investigated pain and anxiety levels as determined by the observers during therapeutic games (17, 21, 31, 45). However, their results showed no statistically significant difference between the experimental and control groups. Another study (34) showed that the level of continuity anxiety during attempted vascular access in the experimental group after the therapeutic game remained similar to that in the control group, while the education provided by the therapeutic game before the medical procedure decreased the level of state anxiety. The remaining 31 studies indicated that allowing hospitalized children to engage in therapeutic games promotes relief of pain and anxiety and increases adherence to hospital procedures. He et al. (39), the first systematic review on this field, showed that six studies reported inconsistent evidence on the effects of therapeutic play on preoperative anxiety, negative behavior, and postoperative pain among children.

The studies included herein, which include children who had undergone surgical procedures (25–27, 29, 30, 33, 35, 47), drug administration (13, 16, 31, 42), blood collection (12, 14–21, 23, 24, 36, 37, 40, 44–46, 49), vascular access (22, 32, 34), reported that therapeutic play can be performed during various invasive procedures. This shows that therapeutic play can be used in various scenarios, and promotes effective communication with the child and collaborative behavior during invasive procedures.

Most studies have opted to utilized accepted scales to ensure ac-

curate measurements of the effect of the intervention. In addition, the use of physiological indicators, such as respiratory rate, blood pressure, heart rate, and oxygen saturation, is considerably important given that they provide evidence of the effect of the therapeutic game on the child's condition. Although only four studies had made use of the aforementioned indicators (25, 40, 42, 49).

While Silva et al. (50) reported the effectiveness of therapeutic games in preparing children for invasive procedures, most studies included herein had suggested that the lack of randomization in determining the experimental and control groups and the lack of blinding among researchers were important concerns. Accordingly, among the 26 randomized controlled trials included herein, 21 utilized randomization, while five failed to implement appropriate randomization.

Our findings showed that 20 of the studies included in the systematic evaluation satisfied more than 80% of the items on the evidence quality assessment tool (Appendix 1). This is important given that the information presented in the systematic review shows that the quality of evidence is based on acceptable studies.

The present systematic review has some limitations that may reduce the power of our evidence. First, the duration of the therapeutic games (minutes or hours) had not been fully specified in each study. Therefore, the average value for the duration of the therapeutic game cannot be determined. In addition, some studies included in the systematic review had small sample sizes (48.7% had below 100 children) and no blinding, with one paper being a thesis.

CONCLUSION AND SUGGESTIONS

Based on the majority of the studies included in the present systematic review, our results showed that therapeutic play was an effective approach to help communicate with children hospitalized in Turkey, aid in the adaptation to the hospital environment, and promote pain and anxiety state relief. As such, our findings suggest that health personnel responsible for hospitalized children could benefit from utilizing therapeutic games.

It remains difficult for participants to be blinded during an educational intervention, such as a therapeutic game, given that members of the experimental group are aware that therapeutic games are an unconventional hospital practice. Considering that failure to achieve blinding can also increases the risk of bias, we recommend that more studies be conducted on the subject, especially those that incorporate blinding, precisely determine the duration of the therapeutic game, and examine physiological parameters in addition to scales and questionnaires.

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Appendix 1. Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
Canbulat Şahiner, N., Türkmen, A.S. (2019)	A randomized controlled trial	Wong-Baker Faces Pain Scale (Wong-Baker Faces Pain Scale) Children's Fear Scale	Distraction cards (Before and after intramuscular injection)	N=120 Experiment=60 Control=60	2015	Children who require IM (intramuscular) intervention in Konya Karaman State Hospital injection unit	Significant differences in the level of pain (reported by the self, parent, and observer) and anxiety (reported by the parent and observer) were observed between the distraction and control groups.	Yes: 10/13 No: 2/13 Uncertain: 1/13
Binay, Ş., Bilsin, E., Gerçeker, G. Ö., Kahraman, A. ve Bal Yılmaz, H. (2019)	A randomized controlled trial	Wong Baker Faces Pain Scale (Wong-Baker Faces Pain Scale) Sociodemographic data form	Blowing Soap Bubbles Buzzy Bee (15 s before and during operation)	N=96 (Buzzy Bee group=32 Soap bubble Blowing group=32 Control group=32)	2017	3–6-year-old children who underwent phlebotomy in a children's blood collection unit of a university hospital in İzmir	Pain scores were found to significantly differ between the groups. Pain scores were found to be lowest in the buzzy group and lower than the soap bubble group.	Yes: 11/13 No: 1/13 Uncertain: 1/13
Özdemir, A. (2019)	A randomized controlled experimental study	Child and Parent Identification Form Anxiety Sensitivity Index for Children Medical Procedures Fear Scale Visual Comparison Scale Faces Pain Benchmarking Scale	Virtual Reality Glasses Distraction Cards (2 to 3 min before the transaction and during the transaction)	N=93 Control=31 Virtual reality glasses=31 Distraction cards=31	2018	Children between the of ages of 6 and 12 who underwent blood collection or vascular access in the pediatric clinic of Kartal Lütfi Kırdar Training and Research Hospital	The use of virtual reality glasses and divert attention cards, which are some of the ways of diverting attention during invasive procedures, are effective in the managing pain, anxiety, and fear. A statistically significant difference in the level of child satisfaction was found, while the virtual reality glasses group had a higher the level of satisfaction than the distraction cards group.	Yes: 9/13 No: 1/13 Uncertain: 3/13
Binay, Ş. (2019)	A prospective, randomized controlled experimental study	Child and Family Identification Data Form Children's Fear Scale Facial Expression Rating Scale WongBaker Faces Pain Scale (Wong-Baker	Animated educational film (3 min–16 s) and a Documentary film (3 to 4 min) were watched using Virtual Reality Glasses	Animated movie group=44 Documentary film group=44 Control group=44	2017–2018	Stage 1: Children between 5 and 12 years of age who will undergo blood collection at Ege University Faculty of Medicine Pediatric Surgery Clinic/ Polyclinics between July and August 2017	Animated educational film about the preparation of surgery in children was found to be an effective method to reduce preoperative fear and postoperative pain. The animated educational film group had a greater decrease in the amount of fear points than the documentary group.	Yes: 11/13 No: 1/13 Uncertain: 1/13

Appendix 1 (cont. 1). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
		Faces Pain Scale)				Stage 2: 6–12-year-old children who will undergo surgery at Ege University Faculty of Medicine, Department of Pediatric Surgery between September 2017 and September 2018		
Ayan, G. (2019)	A randomized controlled experimental study	Information Form Anxiety Sensitivity Index for Children Medical Procedures Fear Scale	Therapeutic Game-Based Training Program (30 minutes)	N=60 Experiment=30 Control=30	2016–2017	8–12-year-old children undergoing circumcision in Zonguldak Bülent Ecevit University Health Application and Research Center	Fear and anxiety scores in the experimental group were significantly lower those in the control group. The study concluded that the therapeutic game applied before circumcision was effective in reducing fear and anxiety that developed due to the procedure.	Yes: 10/13 No: 1/13 Uncertain: 2/13
Yanık, M., Ayyıldız Kuzlu, T. (2019)	A randomized controlled experimental study	Introductory information form Children's Emotional Expression Assessment Scale State and Trait Anxiety Scale Steps in which patients' device skills are evaluated Nebulizer training brochure	Training with brochure and toy nebulizer (15–20 min) Routine hospital training (5 minutes)	N=60 Experiment=30 Control=30	2017–2018	3–6-year-old children and their mothers in Istanbul Okmeydanı Training and Research Hospital	The education given with the toy nebulizer had positive effects on the anxiety of children during nebulization. An increase in the application skills of the mothers after the training was observed, though it did not affect anxiety.	Yes: 7/13 No: 1/13 Uncertain: 5/13
Gerçeker, G. Ö., Binay, Ş., Bilsin, E., Kahraman, A., Yılmaz, H.B. (2018)	A randomized controlled study	Wong-Baker Faces Pain Scale Sociodemographic form	Virtual reality glasses Buzzy (5 minutes during the procedure)	N=121 Virtual reality glasses group=40 Buzzy group=41	2017	Children between 7 and 12 years old without chronic, genetic, mental, or language deficiency	Virtual reality glasses and buzzy device were effective in reducing pain during blood collection. However, no significant difference between the groups was observed.	Yes: 12/13 No: 1/13

Appendix 1 (cont. 2). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
				Control group=40		in the pediatric blood collection unit of a university hospital in İzmir		
Erdoğan, B. (2018)	A randomized controlled study	Visual Analog Scale Wong-Baker Faces Pain Scale Child Fear and Anxiety Scale	Distraction cards (before and during the procedure) Virtual reality glasses (2 min before and during the procedure) Buzzy (1 min before and during the procedure)	N=142 Control=34 Experimental group Cards group=35 Virtual reality glasses group=37 Buzzy group=36	2017–2018	Children between the ages of 7 and 12 in the pediatric blood collection unit of Kocaeli University Training and Research Hospital	Attention cards, virtual reality goggles, and Buzzy methods were effective in reducing pain and anxiety in children during venous blood collection. Pain levels (in descending order) were highest among children in the control group, DBYÇK group, SGG group, and Buzzy group. The control group had the highest anxiety level, followed by the DBYÇK group, SGG group, and Buzzy group.	Yes: 10/13 No: 2/13 Uncertain: 1/13
Taşkın Derleyen, B. (2018)	A randomized controlled experimental study	Data Collection Form State-Trait Anxiety Inventory for Children Medical Procedure Fear Scale Observation Form	Dramatization	N=84 Experiment=42 Control=42	2016–2017	Children aged 7–12 years who will undergo open peripheral vascular access in Edirne Sultan 1. Murat State Hospital Pediatric and Pediatric Surgery Clinic	The therapeutic game method applied before peripheral vascular access was effective in reducing fear and anxiety	Yes: 11/13 No: 1/13 Uncertain: 1/13
İnan, G. (2017)	A randomized controlled experimental study	Data Collection Form Wong-Baker Faces Pain Scale (Wong-Baker Faces Pain Scale) Children's Fear Scale	Cartoon Video Game Method of distracting with parent support (started 3 min before blood collection and continued throughout the	N=180 Cartoon=45 Video game=45 Method of diverting attention with the support of the parent=45 Control=45	2016	Children aged 6–10 years in the Göztepe Training and Research Hospital of Istanbul Medeniyet University for any reason and directed to the blood collection unit by the doctor for blood sampling.	Playing video games, watching cartoons, and diverting attention from parents were effective in reducing pain and anxiety during blood collection. The most effective way to reduce pain and anxiety was playing video games. All three methods can be used to reduce pain and anxiety among children during the blood collection process.	Yes: 10/13 No: 1/13 Uncertain: 2/13

Appendix 1 (cont. 3). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
			procedure)					
Göksu, F. (2017)	A randomized controlled experimental study	Introductory Information Form Faces Pain Benchmarking Scale and Visual Benchmarking Scale	Virtual reality glasses (5 min)	N=80 Experiment=40 Control=40	2016	Children aged 6–10 years who will undergo blood collection at Zonguldak Bülent Ecevit University Health Application and Research Center, a children's outpatient clinic	Virtual reality glasses was effective in reducing pain during the blood collection process.	Yes: 10/13 No: 2/13 Uncertain: 1/13
İnal, S., Kelleci, M. (2017)	A randomized controlled experimental study	Child Anxiety and Fear Face Scale	Buzzy distraction cards (during the procedure)	N=218 Control=56 Buzzy=55 distraction cards=55 Buzzy + distraction cards=52	2010	Children between the ages of 6 and 12 who will undergo blood collection at a pediatric clinic of a university hospital in İstanbul	All three groups experimental had significantly lower pain levels than the control group, with the lowest pain levels being measured in combination group (buzzy and distraction cards). The mean score of the device group was lower than the distraction group.	Yes: 11/13 No: 1/13 Uncertain: 1/13
Aydın, D., Şahiner, N.C. (2017)	A prospective randomized controlled study	Wong-Baker FACES Pain Rating Scale Children's fear scale Information Form	Distraction cards Music therapy Music therapy and distraction cards (during the procedure)	N=200 Control group=50 Distraction cards group=50 Music group=50 Music and distraction cards group=50	2015	Children aged 7–12 requiring blood tests at Balıkesir Bandırma State Hospital	During phlebotomy, pain and anxiety decreased in all three intervention groups, albeit not significantly.	Yes: 10/13 No: 2/13 Uncertain: 1/13
Coşkuntürk A.E., Gözen D. (2017)	A randomized controlled experimental study	Beck Anxiety Scale State Anxiety Inventory for Children	Bear Teddy therapeutic toy (30 min)	N=43 Experimental group=23 Control group=20	2015	6–12-year-old children and their mothers who underwent surgery at a pediatric cardiac surgery department of an educational research hospital in Istanbul	Preoperative training to preoperative patients between the ages of 6 and 12 using therapeutic games decreased anxiety levels of the children and their mothers during the postoperative period.	Yes: 11/13 No: 1/13 Uncertain: 1/13

Appendix 1 (cont. 4). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
Orhan, E., Yıldız, S. (2017)	A randomized controlled experimental study	Child Information Form State-Trait Anxiety Inventory for Children	IV Education and Coloring Book Toy-Chemo Duck (15–40 min)	N=40 Experimental group=20 Control group=20	2012–2013	Children aged 8–12 who were receiving treatment at the İstanbul Hematology-Oncology Department, Cerrahpaşa School of Medicine Pediatric Hematology-Oncology Department and American Hospital Pediatric Department	The level of continuity anxiety remained the same in the control and experimental groups, while the education given using therapeutic play did not affect the continuity anxiety in the children. The state anxiety level was high in the control group and low in the experimental group. The education given using the therapeutic game before the medical procedure decreased the state anxiety level in the children.	Yes: 8/13 No: 3/13 Uncertain: 2/13
Aydın, B.G., Yüksel, S. ve ark. (2016)	A prospective, randomized controlled study	Yale Preoperative Anxiety Scale	Play-Doh (6 min)	N=104 Experiment=52 Control=52	2013	Healthy children aged 3–7 years scheduled to undergo elective surgery in İstanbul Yıldırım Beyazıt Dışkapı Training and Research Hospital	The distractibility of playing with play dough facilitates the administration of oral midazolam among young children.	Yes: 10/13 No: 2/13 Uncertain: 1/13
Karakaya, A., Gözen, D. (2016)	A randomized controlled experimental study	Child and Family Information Form Facial Pain Scale Pulse Oximeter Non-contact Thermometer	Kaleidoscope (during operation)	N=144 Experiment=72 Control=72	2012	Children needing blood sampling at the Children's Blood Collection Unit of the Training and Research Hospital in İstanbul	Pain levels during blood collection were significantly higher in the control group than experimental group.	Yes: 10/13 No: 1/13 Uncertain: 2/13
Aydın, D., Şahiner, N.C., Çiftçi, E.K. (2016)	A randomized controlled experimental study	Children's fear scale Wong-Baker FACES Pain Rating Scale	Ball spin Balloon inflating Distraction cards (around 3 min during the procedure)	N=120 Ball spin=30 Balloon inflator=30 Distraction card=30 Control=30	2015	Children aged 7–12 who needed phlebotomy at Balıkesir Bandırma State Hospital	The three methods used during the phlebotomy procedure showed better relief in pain and anxiety compared to the control group, albeit not significantly. Although not statistically significant, pain and anxiety levels in the distracting card group were lower than those in the other groups.	Yes: 12/13 No: 1/13

Appendix 1 (cont. 5). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
Küçükoğlu, S., Aytekin, A., Çelebioğlu, A., Çelebi, A., Caner, İ., Maden, R. (2016)	A randomized controlled experimental study	Premature Infant Information Form Intervention Follow-up Form (heart rate, respiration rate, oxygen saturation) Premature Infant Pain Profile	White noise (1 min before, during, and after the procedure)	N=75 Experimental group=35 Control group=40	2013	Vaccination of newborns held at an Intensive care unit of a university hospital in Turkey	Most of the babies in the control group (82.5%) experienced severe pain, while 17.5% experienced moderate pain. White noise was reported to be effective for this sample.	Yes: 12/13 Uncertain: 1/13
Mutlu, B. ve Balcı, S. (2015)	A randomized controlled experimental study	Child Face Pain Scale	Balloon Inflator Cough number (during the procedure)	N=132 Control group=44 Balloon inflation group=44 Cough number group=44	2011	Children in the blood collection room in Istanbul University Istanbul Faculty of Medicine Department of Child Health and Diseases	During the procedure, those the control group experienced significantly more pain than those in the balloon and cough group. Moreover, no significant difference was observed between the balloon and cough groups. Both interventions were found to be effective in reducing pain during the procedure.	Yes: 12/13 No: 1/13
Canbulat, N., Ayhan, F., İnal, S. (2015)	A randomized controlled experimental study	Wong-Baker Face Scale Children's Fear Scale	Buzzy (during the procedure)	N=176 Experiment=88 Control=88	2012	Konya Karaman Maternity and Children's Hospital Pediatric Surgery Clinic	Fear and anxiety levels were significantly lower in the experimental group than in the control group according to the reports of the parents and the observer.	Yes: 12/13 No: 1/13
Şahiner, N.C., Bal, M.D. (2015)	A randomized controlled experimental study	Wong-Baker Faces Pain Rating Scale Child Odor Scale	Distraction cards Cartoon Music Balloon inflating (minimum 1 min and maximum 5 min during the procedure).	N=120 Distraction cards group=30 Cartoon Group=30 Balloon Inflator group=30 Control group=30	2014	Konya Karaman Obstetrics and Children Hospital Pediatric Blood Collection Unit	All forms of distraction significantly reduced the perception of pain and anxiety. A significant difference in operational anxiety levels reported by the observer was observed between both study groups. The balloon inflation group had significantly lower anxiety levels than the other groups.	Yes:10/13 No:1/13 Uncertain: 2/13

Appendix 1 (cont. 6). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
Canbulat, N., İnal, S., Sönmezer, H. (2014)	A randomized controlled study	Children's fear scale Wong-Baker FACES Pain Rating Scale	Distraction cards Kaleidoscope (during the process)	N=188 Distraction card group=63 Kaleidoscope group=62 Control group=63	2011	Children aged 7–11 who required blood tests at the blood collection unit of Konya Karaman Maternity and Children's Hospital	Distraction cards were the most effective method for reducing pain and anxiety levels of children during blood collection. Furthermore, distraction using a kaleidoscope was an effective method for relieving pain and anxiety during blood collection in children.	Yes: 12/13 No: 1/13
İnal, S. ve Kelleci, M. (2012)	A randomized controlled experimental study	Child Anxiety Scale Child Face Pain Scale	Distraction cards/ Flippits® (during the procedure)	N=123 Experiment=61 Control=62	2010	Children 6–12 years old who needed blood collection at Istanbul University Cerrahpasa Medical Faculty Children's Clinic	The experimental group had significantly lower pain and anxiety levels during blood collection than the control group.	Yes: 11/13 No: 1/13 Uncertain: 1/13
İnal, S. ve Kelleci, M. (2012)	A randomized controlled experimental study	Child Anxiety Scale (CAPS) Child Face Pain Scale	Buzzy (during the procedure)	N=120 Experiment=60 Control=60	2010	6–12-year-old children in Istanbul University Cerrahpasa Medical Faculty Hospital Pediatric Blood Collection Unit	The experimental group showed significantly lower pain and anxiety levels during the blood sample collection than the control group. The use of Buzzy did not make a significant difference in the success of the blood sample collection procedure.	Yes: 12/13 Uncertain: 1/13
Bartık, K., Toruner, E.K. (2018)		Koppitz Human Figure Drawing Test Child State Anxiety Scale PedsQL Parental Health Care Satisfaction Scale	During the preoperative preparation period, Koppitz Human Figure Drawing Test was provided to the experimental and control group and Coloring Book + Cloth Doll [Preparation and Education in Daily	N=73 Experiment=36 Control=37	2014–2015	Children ages 7–12 in day surgery unit of a university hospital in Turkey	The preoperative preparation program has a positive effect on children and their parents. The satisfaction level of the parents in the intervention group was significantly higher than the control group. According to the Koppitz Drawing Test, children in the emotional state of the control group were higher than impulsivity, anxiety and anger-related intervention groups.	Yes: 8/9 No: 1/9

Appendix 1 (cont. 7). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
	Semi-experimental study		Pediatric Surgery (Care of your child in outpatient surgery)] was provided to the experimental group.					
Demirel, S. (2017)		Descriptive Data Form (TBF) Medical Procedure Fear Scale	Training videos, training brochure, and training model (baby model on which medical procedures can be shown) (Video1=12 min Video 2=6 min)	N=90 Experiment=45 Control=45	2015	Children aged 7–14 receiving treatment at the pediatric clinic of Afyonkarahisar State Hospital	The education program given to hospitalized children considerably reduced the fear of medical procedures.	Yes: 9/9
Tuncay, S. (2017)	Pre-and post-test quasi-experimental design with a control group	Wong-Baker Face Scale Life Findings Form The number of in-bed movements was evaluated by observation	Digital game (1 h)	N=80 Experiment=40 Control=40	2016–2017	Children aged 4–17 years undergoing angiography at Malatya İnönü University Turgut Özal Medical Center Pediatric Cardiology Clinic	Playing digital games decreased pain levels and mobilization among children undergoing angiography. Moreover, during the final test, a significant difference was found between the oxygen saturation and the number of in-bed movements between the digital game group and the control group.	Yes: 7/9 No: 1/9 Uncertain: 1/9
Aytekin, A., Doru, Ö., Küçükoğlu, S. (2016)	Prospective, two-group experimental study	Information Form Discrimination Anxiety Rating Continuous-State Anxiety Inventory for Children	Computer games Music Cartoon One of the book applications was chosen by the child (40 min).	N=83 Experiment=40 Control = 43	2013–2014	Children 9–18 years old at the preoperative clinic of the pediatric surgery department at a university hospital in Turkey	Children provided distraction methods during the preoperative period had significantly reduced anxiety and separation anxiety.	Yes: 9/9
Karakoç, A.,	Experimental study	Newborn Pain	White noise	N=120	2010	Healthy newborns	Changes in recorded cardiac and	Yes: 6/9

Appendix 1 (cont. 8). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
Türker, F. (2014)		Scale Heart rate Oxygen saturation	(around 5 min)	Mother's arms =40 Mother's arms and white noise=40 Cots and white noise=40		undergoing heel blood collection at the Department of Obstetrics and Gynecology, Çanakkale State Hospital	respiratory rates differed significantly between the three groups. The shortest crying time and lowest behavioral reactions were found among infants lying in their cribs and listening to white noise. The highest behavioral response was reported among infants held by their mothers but not listening to white noise.	No:1/9 Uncertain:1/9
Koç, S. (2011)	Pre-test–post-test study in a single group using a semi-experimental design	Sociodemographic data form Spielberg State Anxiety Inventory State and Trait Anxiety Scale for Children	Clown visit (5 min)	N=64	2006	Children and their families aged 7–14 years who were hospitalized for at least one day before surgery at three hospitals within a private hospital group. The small and medium surgery groups were established according to the Turkish Medical Association surgical classification.	Hospital clowns were found to be an effective method for reducing preoperative anxiety among children and parents	Yes: 5/9 No: 1/9 Do not apply: 3/9
Güdücü Tüfekci, F., Çelebioğlu, A., Küçükoğlu, S. (2009)	Experiment–control group work	Wong-Baker FACES Pain Rating Scale Visual Analog Scale	Kaleidoscope (during the procedure)	N=30 (exp.=15 cont.=15)	2006	Healthy school children aged 7–11 years needing blood collection at Erzurum Atatürk University, Yakutiye Research Hospital	Distraction performed using a kaleidoscope had been found to effectively reduce the pain associated with blood collection among healthy school children.	Yes: 9/9
Teksoz, E., Bilgin İ., Eryigit Madzwamuse,	Qualitative and quantitative pretest–post-test (mixed study)	Patient Nursing Care Perception Tool for Child participants	Creative play (with medical supplies)	N=30 (exp.=15 cont.=15)	2012	Children aged 8–12 years receiving treatment at pediatric units of Antakya State	The results showed that creative play was a possible nursing intervention that has a strong potential to ensure patient satisfaction.	Yes: 9/9 Yes: 9/10 No: 1/10

Appendix 1 (cont. 9). Characteristics and results of the studies included in the systematic review

Authors (year)	Study design	Data collection tools	Applied therapeutic play and duration	Sample volume	Research year	Sample property	Results	Quality score*
S., Ocakçı, A.F. (2017)		Pedsql Health Satisfaction Tool for Parents				Hospital		
Manav, G., Ocakçı, A.F. (2016)	Qualitative–quantitative (mixed) study	Piers-Harris Self-concept Scale in Children used in child-centered play sessions	Child-centered play therapy Mother–child game (single session) Drawing a family picture (single session) Researcher–child game (six sessions)	N=6	2011	Children aged 9–12 at İstanbul Kartal Semiha Şakir Women and Children's Hospital Pediatric Oncology Clinic	Themes produced by "Nursing Intervention: Game Model (happy memories, control, loss/mourning, good/bad, aggressive behaviors, regression, relationships, trauma, problem solving)" can be used in the planning, implementation, and evaluation of nursing care.	Yes: 9/10 Uncertain: 1/10 Yes: 5/9 No: 1/9 Do not apply: 3/9
Kurt, A.S., Savaşer, S. (2013)	Case–control study	"Patient Information Form," "Perceived Stress Scale" and "Re-Mission Video Game Rating Scale"	Re-Mission video game u (15–20 min per game with 1 h rest for a total of 1 h per day)	N=61 Case group=30 Control group=31	2011	Adolescents aged 13–18 years who were treated between December 2009 and May 2011 at the pediatric hematology-oncology ward of two large hospitals in İstanbul	Re-Mission video game was found to be effective in reducing perceived stress levels among adolescents.	Yes: 8/10 No: 2/10
Büyük, E.T., Bolişik, B. (2015)	Semi-experimental and cross-sectional study	Sociodemographic Information Form State-Trait Anxiety Inventory for Children Medical Procedure Fear Scale Wong and Baker `s Facial Expressions Rating Scale	Training (10 min) Therapeutic play (around 30 min)	N=300 Control group=100 Training Group=100 Education and Play group=100	2010–2012	Preoperative children aged 7–12 years at Samsun Ondokuz Mayıs University Health Application and Research Center Hospital Pediatric Surgery Clinic and Samsun Gynecology and Pediatric Hospital Pediatric Surgery Clinic.	At the end of the study, children that prepared for surgery by playing therapeutic games with education and training had significantly lower anxiety and fear levels than those who did not.	Yes: 9/9 Yes: 8/8

* Total quality assessment score varies according to the type of research. In this systematic review, "number of answers / total score" points were applied