

Research Article

The Effects of Pre-Intervention Training Provided through Therapeutic Play on the Anxiety of Pediatric Oncology Patients during Peripheral Catheterization

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Aim: The study aims to determine the effect of pre-intervention training provided through therapeutic play on reducing the anxiety of pediatric oncology patients during peripheral catheterization.

Materials and Methods: This experimental study was conducted between September 2012 and March 2013. The study included 40 children (20 in the control group and 20 in the experimental group) who were receiving treatment for hematological-oncological diseases in the Pediatric Hematology and Oncology Units of Istanbul University, Istanbul Faculty of Medicine and Cerrahpasa Faculty of Medicine, and in the Department of Pediatrics of the American Hospital. The children were randomly allocated into the experiment and control groups. The children were asked to complete an information form before the peripheral catheterization. The intervention was explained to the experimental group through therapeutic play. The data obtained through the State-Trait Anxiety Inventory for Children (STAIC) after the peripheral catheterization were analyzed using the Statistical Package for Social Science (SPSS) 21 package for Windows.

Findings: It was found that the mean trait anxiety scores were similar and remained moderate in the experimental and control groups; that there wasn't any statistically difference between the groups ($p < 0.05$); and that the mean state anxiety score of the experimental group was lower than that of the control group (Control: 43.40 ± 5.42 , Experimental: 31.50 ± 4.73) and this difference was statistically significant ($p < 0.001$). The state anxiety level was found to be reduced in all children - regardless of the variables - with the training provided through therapeutic play.

Conclusion: Children provided training with therapeutic play before the intervention can reduce their anxiety during procedures, such as peripheral catheterization. The use of therapeutic play made widespread in health institutions will decrease both pain and suffering in children.

Keywords: Therapeutic play; Education; Anxiety; Peripheral catheterization; Cancer; Child

Introduction

Pediatric cancer is a life-threatening chronic disease. Despite significant progress with medical treatment and in the rates of survival in the last 30 years, progress in terms of the children's psychosocial problems remains inadequate. Therefore, the number of studies on the psychosocial status of children with cancer has increased in the last 15 years [1-3].

The worst aspect of cancer for children diagnosed with the disease is the repetitive and painful treatment procedures to which they are exposed. The frequent intravenous, subcutaneous or intramuscular interventions and insertion of port-catheters cause stress and fear in hospitalized children [4,5].

Nurses should be aware of the fact that any medical practice can be traumatic for children. In particular, school-age children may want to learn the reasons for the medical practices and tests and can

ask questions about their disease, as they have an idea of body parts, organs and their functions. Nurses should inform the children about the treatment procedures, making sure that they understand them, and in doing so, choose the appropriate technique for the children's developmental age, competence for coping with the disease and previous experience [3,6-8].

Nurses also should reduce the children's anxiety or stress due to the experience they have in the hospital and prepare them for the next treatment procedures they will undergo [9]. One of the most appropriate methods for this is therapeutic play. Therapeutic play is a play technique which reduces the trauma due to the disease or being hospitalized, evaluates the children's feelings and misunderstandings about the treatment or procedures, and is used for the children to develop positive coping methods before, during and after the events that cause stress [10,11].

Many case studies indicate the benefits of therapeutic play for hospitalized pediatric patients: Therapeutic play was emphasized to be important in meeting the psychosocial needs of pediatric oncology patients by O'Connor and Drennan in 2003, in developing a trust relationship between pediatric patients and healthcare personnel by Pan, Chiu, Shen and Chen in 2004, and in reducing the children's negative feelings during bloodletting by Riberio and Sabates in 2001 [12].

Children can better understand the reasons for being hospitalized, having surgery or invasive procedures and learn to cope with the stress caused by these factors more effectively. Bandages, injectors without needles, gloves, masks or uniforms to be worn, or dolls on which children can practice, are among appropriate materials that can be used in dramatic play. Medical toys are useful to show medical and surgical operations to children and help them express their feelings [3,4].

Even in a hospital, a child's world is a world of playing. Enabling hospitalized children to play has become one of the necessities of nursing. In particular, pediatric nurses should know the importance of playing, research this subject and be able to use play while they are giving care to hospitalized children [2,8].

This study aims to determine the effect of pre-intervention training provided through therapeutic play on reducing the anxiety of pediatric oncology patients during peripheral catheterization.

The hypotheses of this study

H_0 : There is no difference between the postprocedural state anxiety levels of children who receive, or do not receive training through therapeutic play.

H_1 : The postprocedural state anxiety level is lower in the children who receive training through therapeutic play.

H_2 : The postprocedural state anxiety level is higher in the children who do not receive training through therapeutic play.

The independent variables of this study were the training provided to the children through therapeutic play and the introductory information on the children (age, gender, education, etc.), and the dependent variable was the score on the State-Trait Anxiety Inventory for Children.

Materials and Methods

The permissions were obtained from the Clinical Research Ethics Committee of Istanbul University, Cerrahpasa Faculty of Medicine Dean's Office (No: B.30.2.İST.0.30.90.00/26699, Date: 9.10.2012), the Pediatric Hematology and Oncology Unit of Cerrahpasa Faculty of Medicine, Department of Pediatrics (No: 31553, Date: 1.11.2012), Istanbul Faculty of Medicine, Oncology Institute (No: B.30.2.İST.0.53.00.00/2901, Date: 10.17.2012), and the American Hospital, Directorate of Nursing Services (No: 13092012-35, Date: 13.09.2012) before the study. The parents and children were informed about the aim, plan and duration of the study using the Informed Consent Form before the study, and then included in the study if they volunteered to participate.

This experimental study was conducted with pediatric oncology patients in the Pediatric Hematology and Oncology Units of Istanbul

University, Istanbul Faculty of Medicine and the Cerrahpasa Faculty of Medicine, and in the Department of Pediatrics of American Hospital to analyze the effect of the training provided through therapeutic play before peripheral catheterization on the anxiety level of children aged between 8 and 12 who receive treatment in pediatric hematology-oncology units. The study population consisted of 40 pediatric patients receiving treatment in these units for hematological-oncological diseases. The sample size was calculated through power analysis at 95% confidence interval and with $\pm 5\%$ margin of error in line with the literature [1,12], and determined to be 34 patients: 17 in the control group and 17 in the experimental group. All were children ($n=40$) who were receiving treatment in these units during the dates of this study and met the inclusion criteria, considering the possible participant losses. The children were randomly allocated into the experimental and control groups.

Inclusion criteria

The participants must have been;

- Aged between 8 and 12,
- Receiving treatment through peripheral vascular access, and
- At the mental development level to be able answers the questions.

Data Collection Tools

The data were collected using the information form for Children prepared by the researcher to obtain introductory information on the children and the State-Trait Anxiety Inventory for Children to assess the children's anxiety level. During the intervention, the children were provided training using the Chemo Duck toy and a training booklet.

Information form for children

The form includes 18 questions on the children's age, gender, literacy, number of siblings, health coverage, diagnosis, duration of the diagnosis, knowing the diagnosis, having surgery and the type of the surgery, existence of physical disability and its type, having chemotherapy and number of cycles, having radiotherapy and the number of sessions, and the number of monthly laboratory tests and hospitalizations. The form was administered as a pilot study to the first 10 cases.

The training booklet

The Vascular Access Training and Coloring Book prepared by the researcher provides information about the definition, intended use and benefits of peripheral vascular access through caricatured drawings and gives the children a chance to color them while reading the information. The drawings have caricatured by the researcher and the information has referenced and translated in Turkish from The Chemo Duck website [13] (Figure 1).

The State-Trait Anxiety Inventory for Children (STAIC)

This inventory was developed by Spielberg in 1973 and adapted into Turkish language by Şeniz Özusta in 1995. It can be administered to children aged between 9 and 12 and was tested for validity and reliability. The STAIC has two subscales, each including 20 items, along with reverse statements. The Cronbach's alpha coefficient was

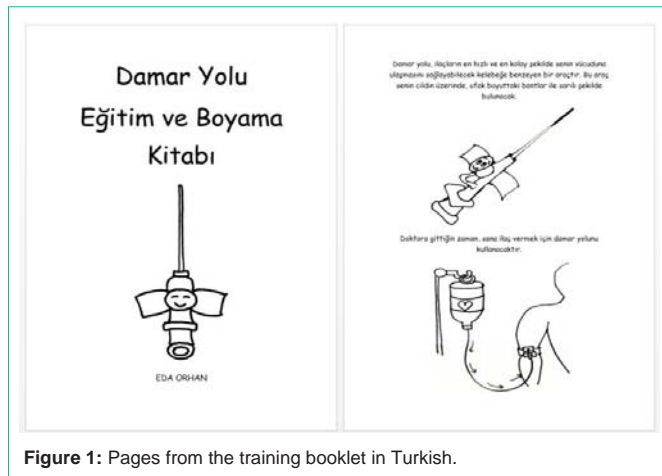


Figure 1: Pages from the training booklet in Turkish.



Figure 2: Chemo Duck Toy, (Reference: <http://chemoduck.org/about/>).

found to be 0.82 for the state anxiety subscale, and 0.81 for the trait anxiety subscale, in a study conducted with 615 healthy children.

State anxiety subscale

The children are asked to select one of three choices about how they feel at that very moment. The subscale includes 20 items assessing feelings about state-anxiety such as stress, anger, or panic. Half of the items reflect uneasiness, panic and stress, and the other half reflect the intensity of these feelings. The maximum score of the items is 3 (showing the intense existence of these feelings), and the minimum score is 1 (showing non-existence of these feelings). The minimum and maximum total scores of the state anxiety scale are 20 and 60, respectively. The STAIC can be administered to an individual or to a group.

Trait anxiety subscale

The children are asked to select the most appropriate choice according to how they generally feel themselves about the occurrence frequency of the situation given in the items. Each item is answered as “almost never,” “sometimes,” and “often,” where “often” yields the maximum item score of 3, and “almost never” yields the minimum item score of 1. The minimum and maximum total scores of the trait anxiety scale are 20 and 60, respectively [14].

The chemo duck toy

The toy, used as a training material for therapeutic play in this

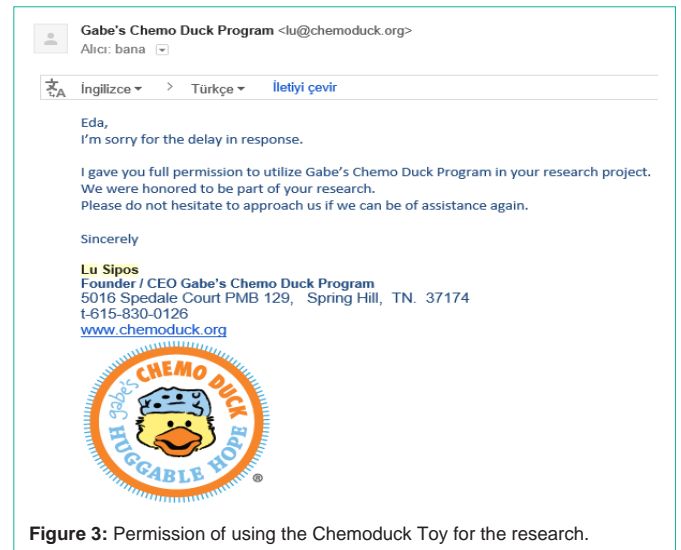


Figure 3: Permission of using the Chemo Duck Toy for the research.

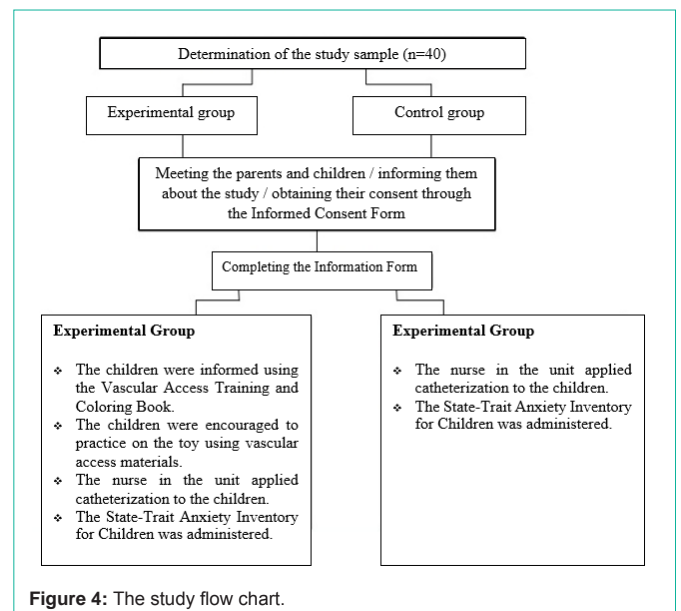


Figure 4: The study flow chart.

study, was developed by an entrepreneur mother named Lu Sipos in the USA. It is produced in Spring Hill, USA and used to train pediatric oncology patients in the hospital around the city under the name of “Gabe’s Chemo Duck Program”. The Chemo Duck toy has a port catheter site, a bandanna, an arm bandage, and surgical scrubs. The children have an opportunity to practice the treatment or procedures in the hospital as they play with this toy (Figure 2, Reference: <http://chemoduck.org/about/>). The permission of Lu Sipos was obtained *via* e-mail to use the toy and 10 toys were sent to be used in this study (Figure 3).

Data Collection

The children were included in the study after their parents were informed about the study using the Informed Consent Form and they approved the participation of their children. The data were collected by the researcher.

The Information form for children was administered as a pilot

Table 1: Sociodemographic characteristics (n=40).

Groups	Control (n=20)		Experimental (n=20)		χ^2	p
	n	%	n	%		
Age						
8-10 years	8	40.0	7	35.0	0.11	0.74
11-12 years	12	60.0	13	65.0		
Gender						
Female	5	25.0	6	30.0	0.13	0.72
Male	15	75.0	14	70.0		
Literacy						
Yes	19	95.0	19	95.0	Fisher	1.00
No	1	5.0	1	5.0		
Number of Siblings						
None or 1 sibling	10	50.0	7	35.0	0.92	0.34
2 or more siblings	10	50.0	13	65.0		
Health Coverage						
SSI	16	84.2	17	65.0	0.23	0.63
Private Insurance	4	15.8	3	35.0		

Table 2: Comparison of the groups in terms of diagnosis (n=40).

Groups	Control (n=20)		Experimental (n=20)		χ^2	p
	n	%	n	%		
Diagnosis						
Leukemia	5	25.0	5	25.0	3.9	0.1
Tumor	13	65.0	8	40.0	7	38
Lymphoma	2	10.0	7	35.0		
Duration of the Diagnosis						
Newly diagnosed / 1 year	15	75.0	12	60.0	1.03	0.311
2 years or more	5	25.0	8	40.0		
Knowing the Diagnosis						
Knowing	14	70.0	15	75.0	0.13	0.723
Not knowing	6	30.0	5	25.0		

Table 3: Comparison of the groups in terms of having surgery and physical disability (n=40).

Groups	Control (n=20)		Experimental (n=20)		χ^2	p
	n	%	n	%		
Having Surgery						
Yes	12	60.0	10	50.0	0.40	0.525
No	8	40.0	10	50.0		
Type of Surgery						
Did not have	8	40.0	10	50.0		
Tumor resection	8	40.0	5	25.0	0.40	0.525
Biopsy	4	20.0	5	25.0		
Physical Disability						
Yes	3	15.0	4	20.0	0.17	0.677
No	17	85.0	16	80.0		

study to the first 10 cases with 14 questions.

The experimental group

Before the intervention, the Information form was completed by the patients in between 10-15 minutes. After filling the information form the researcher explained to the patients what peripheral vascular access is, why it is used, its benefits and how it is applied, in line with the Vascular Access Training and Coloring Book. After the explanation the researcher performed with the patients using peripheral vascular access materials (intravenous catheter without needle, injectors without needles, cotton and bandage) on the chemo duck toy. The materials were used under the control of the researcher and the patients were not hurt in any way. The training took minimum 20 minutes and maximum 30 minutes depending on the children's level of understanding; answering their questions about the procedure. Catheterization was applied to the children by the nurse of the unit after the training. The STAIC form was filled by the researcher by asking the children the questions, one by one when the peripheral catheterization finished (Figure 4).

Control group

Before the intervention, the information form was completed by the patients in between 10-15 minutes. Catheterization was applied to the children by the nurse in that unit. The STAIC was then completed by the researcher by asking the children the questions, one by one.

Data Analysis

The data were analyzed using the Statistical Package for the Social Science (SPSS) 21 package for Windows. Mean, standard deviation, frequency and percentage distribution were used for statistics. The chi-square and Fisher's exact probability tests were used to compare the frequencies and percentages between the groups. The T test for comparison of two groups was used to compare the normally distributed variable means. The significance level was accepted $p=0.05$ in the interpretations.

Findings

There wasn't any statistically difference between the sociodemographic characteristics of the experimental and control groups such as age, gender, literacy rate, number of siblings and having a health coverage (Table 1: $p>0.05$). The socioeconomic characteristics were similar in the experimental and control groups.

The diagnosis distribution of the children showed that tumor cancer was predominant; most children had been diagnosed with cancer within the last one year. The majority of the children had had surgical operations. No statistically significant difference was found between the diagnostic characteristics of the experimental and control groups (Table 2; $p>0.05$); the groups had similar characteristics.

The children who had had surgery were predominant in the control group (60%) and equal in the experimental group (50%). Physical disability level was low in both the experimental and the control group. No statistically significant difference was found between the experimental and control groups in terms of these variables (Table 3; $p>0.05$).

All patients in the experimental and control groups were receiving chemotherapy. Most of the patients had received three or

Table 4: The distribution and comparison of the disease characteristics.

Groups	Control (n=20)		Experimental (n=20)		X ²	p
	n	%	n	%		
Receiving Chemotherapy						
Yes	20	100	20	100	0	1
No	0	0.0	0	0.0		
Number of Cycles						
1 or 2 cycles	7	35	3	15	2.13	0.144
3 or more cycles	13	65	17	85		
Receiving Radiotherapy						
Yes	11	55	15	75	1.76	0.185
No	9	45	5	25		
Number of Radiotherapy						
Not Receiving	10	45	15	75		
1 day	1	5.3	0	0	2.67	0.263
3 or more days	8	49.7	5	25		
Monthly Laboratory Test Having Laboratory Tests						
1 or 2 times	10	50	13	65		
3 or more times	10	50	7	35	0.92	0.337
Number of Monthly Hospitalization						
1 or 2 times	11	55	13	65	0.42	0.52
3 or more times	9	45	7	35		

Table 5: Comparison of the Mean State-Trait Anxiety Scores.

Variables	Min.-Max.	Experimental			Control			t	p
		n	Mean	±SD	n	Mean	±SD		
Trait Anxiety Score	20-60	20	33.55	7.08	20	35.40	5.71	0.910	0.369
State Anxiety Score	20-60	20	31.50	4.73	20	43.40	5.42	7.40	0.000

more chemotherapy cycles both in experimental and control groups. In addition, most of them also receive radiotherapy. The children had laboratory tests once or twice a month. Most of the children in the experimental (65%) and control (55%) groups were hospitalized for once or twice a month. No statistically significant difference was found between the experimental and control groups in terms of these variables (Table 4; $p > 0.05$).

The mean trait anxiety score was 35.40 ± 5.71 in the control group and 33.55 ± 7.08 in the experimental group. The statistical assessment showed no significant difference between the groups ($t = 0.910$; $p = 0.369$). The mean state anxiety score was 43.40 ± 5.42 in the control group and 31.50 ± 4.73 in the experimental group. The state anxiety score of the experimental group was significantly lower than that of the control group (Table 5; $p = 0.000$).

Discussion and Conclusion

It was found that the mean trait anxiety scores were similar and remained moderate in the experimental and control groups and there wasn't any statistically significant difference between the groups. The state anxiety score of the control group was statistically significantly higher than that of the experimental group (Table 5). This shows that

the training provided to the children through therapeutic play before the procedure reduced the state anxiety level of the children caused by venous catheterization. Many studies and publications support this result.

These studies highlight that it is critical to prepare and inform the children before they undergo painful procedures, such as catheterization [15-17]. A research conducted with children aged between 7 and 12 reported that the training through therapeutic play before a surgical operation, reduced their postoperative anxiety levels [12]. A study conducted with 142 children in 2012 reported that informing children before bloodletting reduced their anxiety after the procedure [18]. A study conducted with 33 children aged between 5 and 12 also showed that a medical game played before examination reduced the children's anxiety levels [19]. The most important difference of this research from previous studies is the sample type studied on pediatric oncology patients as explained children who had chronic disease. Another study of Chen et al. (2013) conducted with 19 children aged between 3 and 15 who had brain tumors revealed that preparation through therapeutic play before radiotherapy reduced the children's anxiety level. The sample type is similar with the study of Chen et al. but our study based on a larger sample size and the peripheral catheterization as a medical procedure is more painful than radiotherapy.

In the beginning of the study;

The H_0 explained the possibility of indifference between postprocedural state anxiety levels of children who receive, or do not receive training through therapeutic play. The H_1 explained the postprocedural state anxiety level is lower in the children who receive training through therapeutic play and the H_2 explained the postprocedural state anxiety level is higher in the children who do not receive training through therapeutic play.

Based on the research results;

- The H_1 and the H_2 was supported.
- The H_0 wasn't supported based on the research results showed that the postprocedural state anxiety level is lower in the children who do not receive training through therapeutic play.

It is recommended that:

- The method of training through pre-intervention therapeutic play be used to reduce the children's state anxiety and negative reactions during invasive procedures such as catheterization;
- Awareness of the pediatric nurses be raised on the importance of therapeutic play and informing children before medical procedures;
- The use of the method of training through therapeutic play in different medical interventions and age groups be supported by other evidence-based studies.

The Limitations of the Study

The research first planned with pediatric oncology patients who have port catheters. However due to the lack of sufficient numbers meeting, the researcher changed the sample criteria to pediatric oncology patients who had peripheral IV catheters.

It was planned to use the State-Trait Anxiety Inventory for Children before the intervention and was used in the first three cases; however, it took longtime for patients as filling the information form and STAI, explanation of the procedure and practicing catheterization with the toy took a total of one hour delay on medication. In addition, the duration of case collection was extended due to the difficulty of finding pediatric oncology patients aged between 8 and 12 who received chemotherapy through a peripheral line.

During the research it was paid regard to the state anxiety score, because the trait anxiety is variable from person to person.

Because of difficulty of control environmental factors, the similarity of socioeconomic characteristics in the experimental and control groups was featured.

References

- Gariépy N, Howe N. The therapeutic power of play: examining the play of young children with leukaemia. *Child: Care, Health & Development*. 2003; 29: 523-537.
- Haiat H, Bar-Mor G, Shochat M. The World of the Child: A World of Play Even in the Hospital. *Journal of Pediatric Nursing*. 2003; 18: 209-214.
- Ball JW, Bindler RC, Cowen KJ. *Child Health Nursing-Partnering With Children and Families*, 2nd Edn, Pearson Education; New Jersey, USA. 2010.
- Slifer KJ, Tucker CL, Dahlquist LM. Helping Children and Caregivers Cope with Repeated Invasive Procedures: How are we doing? *Journal of Clinical Psychology in Medical Settings*. 2002; 9: 131-152.
- Breiner SM. Preparation of the Pediatric Patient for Invasive Procedures. *Journal of Infusion Nursing*. 2009; 32: 252-256.
- James SR, Ashwill JW, Droske SC. *Nursing Care of Children-Principles and Practice*, 2nd Edn, W.B. Saunders Company, USA. 2002.
- LeRoy S, Chair M, Elixson EM, Cochair M, O'Brien P, Tong E, et al. Recommendations for Preparing Children and Adolescents for Invasive Cardiac Procedures. *Journal of the American Health Association*. 2003; 108: 2550-2564.
- Kuğuoğlu S, Tanır MK. Gelişim Dönemlerine Göre Oyunun Terapötik Kullanımı, *Ege Üniversitesi Hemşirelik Yüksek Okulu Dergisi*. 2006; 22: 293-304.
- Maia EB, Ribeiro CA, Borba RI. Understanding Nurses' Awareness as to the Use of Therapeutic Play in Child Care. 2011; 45: 839-846.
- Çavuşoğlu H. Çocuk Sağlığı Hemşireliği. *Bizim Büro Basımevi*, Ankara. 2002; 64.
- Altay NC. Çocuklarda Ameliyat Öncesi Hazırlık. *Sağlık Bilimleri Fakültesi Hemşirelik Dergisi*. 2008; 68-76.
- Li HC, Lopez V. Effectiveness and Appropriateness of Therapeutic Play Intervention in Preparing Children for Surgery: A Randomized Controlled Trial Study. *JSPN*. 2008; 13: 63-73.
- Gabe's My Heart Company. *I'm Still Me! - A Fun Activity Book for Kids with Living with Cancer*. 2008.
- Özusta Ş. Çocuklar için Durumluk Sürekli Kaygı Envanterinin uyarlama, Geçerlik ve Güvenirlik Çalışması. *Türk Psikoloji Dergisi*. 1995; 10: 32-44.
- Cohen LL, Lemanek K, Blount RL, Dahlquist LM, Lim SC, Palermo TM, et al. Evidence-Based Assessment of Pediatric Pain. *Journal of Pediatric Psychology*. 2008; 33: 939-955.
- Savaşer S, Yıldız S, Gözen D, Balcı S, Mutlu B, Çağlar S. *Hemşireler İçin Çocuk Sağlığı ve Hastalıkları Öğrenim Rehberi*. İstanbul: İstanbul Tıp Kitabevi. 2009.
- Hudges T. Providing Information to Children Before and During Venepuncture. *Nurs Child Young People*. 2012; 24: 23-28.
- Balcı S, Mutlu B. Çocuklarda Venöz Kan Örneği Alırken Oluşan Ağrıyı Azaltmada Balon Şişirme ve Öksürme Yöntemlerinin Etkisi (Doktora Tezi), İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü- Çocuk Sağlığı ve Hastalıkları Hemşireliği Anabilim Dalı/Çocuk Sağlığı ve Hastalıkları Hemşireliği Programı. 2012.
- Nader S, Reif MH, Thoma SJ. Play and Video Effects on Mood and Procedure Behaviors in School-Aged Children Visiting the Pediatrician. *Clinical Pediatrics*. 2013; 52: 929-935.