THE EFFECT OF THE CHILDREN'S YOGA PROGRAM APPLIED TO PEDIATRIC ONCOLOGY PATIENTS ON THE CHILD'S QUALITY OF LIFE AND CORTISOL LEVELS

ÇOCUK ONKOLOJİ HASTALARINA UYGULANAN ÇOCUK YOGA PROGRAMININ ÇOCUĞUN YAŞAM KALİTESİ VE KORTİZOL SEVİYELERİ ÜZERİNE ETKİSİ

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ABSTRACT

The study was conducted experimentally in the form of pre-test and post-test with 30 controls, 30 study group children who were 8-18 age and treated on 19.01.2020- 19.08.2020 in the Pediatric Oncology/Hematology service of a hospital in Mersin with their parents, in order to investigate the effect of children's yoga program on the quality of life and cortisol levels of pediatric oncology patients. Ethics committee, institutional and parental consent was obtained. Data were collected using a questionnaire, the Children's Quality of Life Scale, and the cortisol kit. Participants filled out the "Children's Quality of Life Scale" Child and Parent Form before the 3-week (6 sessions) yoga program and salivary cortisol samples were taken from the children. These procedures were repeated after the yoga program. At the end of the intervention, the child report total score of the study group increased from 55.58±15.06 to 70.83±10.22, and the parent score increased from 53.73±14.29 to 70.47±11.83. The child report total score of the control group decreased from 49.67±13.71 to 44.13±16.77, and the parent score decreased from 49.17±15.28 to 37.93±13.96 ($p<0.05$). In the reports of children (Cronbach α: 0.904-0.943) and parents (Cronbach α: 0.888-0.939), the answers to the scale questions were found to be highly reliable. It was observed that cortisol values decreased from 3.18±2.11 to 2.26±1.92 in the study group and increased from 2.45±2.15 to 2.64±2.08 in the control group ($p<0.05$). The study found positive results in increasing the quality of life of pediatric oncology patients and reducing their stress. In order to help pediatric oncology patients improve their quality of life and reduce their stress, it is recommended that pediatric health and disease nurses integrate yoga practice into care plans while providing care to their patients, and establishing children's yoga areas where yoga practices can be practiced in hospitals' pediatric oncology services.

Keywords: Child Yoga, Cortisol, Pediatric Oncology Nursing, Stress, Quality of Life

ÖZET

Pediatrik onkoloji hastaları, tedavi süresince yaşam kalitelerini olumsuz etkileyen fiziksel ve psiko-sosyal semptomlar yaşar. Pediatrik onkoloji hastalarının yaşam kalitesini artırmaya yönelik zihin-beden farkındalığı ile nefes çalışmalarını birleştiren eşsiz bir fiziksel aktivite olarak bilinen "Yoga" uygulamaları, son zamanlarda popüler olmaya başlamıştır. Çalışma, çocuk yogası programının, pediatrik onkoloji hastalarının yaşam kalitesi ve kortizol düzeylerine etkisini araştırmak amacıyla, Mersin'de bir hastanede Çocuk Onkoloji/Hematoloji servisinde 19.01.2020-19.08.2020 tarihlerinde tedavi gören 8-18 yaş grubu 30 kontrol, 30 çalışma grubu çocuk ve onların ebeveynleri ile ön test, son test şeklinde deneysel olarak yapıldı. Etik kurul, kurum ve

ebeveyn onamı alındı. Veriler anket formu, Çocuklar İçin Yaşam Kalitesi Ölçeği ve kortizol kiti kullanılarak toplandı. Katılımcılara 3 haftalık (6 seans) yoga programı öncesi Yaşam Kalitesi Ölçeği çocuk ve ebeveyn formu doldurtularak, çocuklardan tükürük kortizol örneği alındı. Yoga programı sonunda bu işlemler tekrarlandı. Nicel değişkenlerin analizlerinde "İndependent Sample-t test", "PairedSample", "Mann Whitney U", "Wilcoxon", test ve Spearman" korelasyon katsayısı kullanıldı. Nitel değişkenlerin analizinde "Pearson -X2" çapraz tabloları kullanıldı. Çalışma grubuna müdahale sonunda, çocuk raporu ölçek toplam puanı 55.58±15.06'dan, 70.83±10.22'e, ebeveyn puanı ise 53.73±14.29'dan, 70.47±11.83'e yükseldi ($p<0.05$). Kontrol grubunun çocuk raporu puanı 49.67±13.71'den,44.13±16.77'e, ebeveyn puanı ise 49.17±15.28'den, 37.93±13.96'a düştü ($p<0.05$). Çocuk (Cronbach a: 0.904-0.943) ve ebeveynlerin (Cronbach a:0.888-0.939) raporlarında ölçek sorularına verdikleri cevaplar yüksek düzeyde güvenilir bulundu. Çalışma grubuna kortizol değerlerinin 3.18±2.112den 2.26±1.92'ye düştüğü, kontrol grubunda ise 2.45±2.15'ten 2.64±2.08'e yükseldiği görüldü ($p<0.05$).

Anahtar Kelimeler: Çocuk Sağlığı ve Hastalıkları Hemşireliği, Çocuk Yogası, Kortizol, Stres, Yaşam Kalitesi

1. INTRODUCTION

The diagnosis and treatment phase of pediatric oncology patients disrupts the physical, emotional and economic balances of the child and family, reducing their quality of life. The quality of life of children with cancer decreases due to physical/emotional problems caused by the disease, radiotherapy and chemotherapy, side effects of treatment, surgical interventions, long hospital stays, isolation, changes in the course of the disease, separation from family/friends, lack of support systems and coping methods and interruption of school life (Matzio et al., 2008). Evaluating the impact of cancer disease and the treatment process on the quality of life of the child and family is important in terms of determining nursing care programs that will support the child and his family's adaptation to the disease, their biopsychosocial development, and their quality of life (Flanagan, 2001). Intermittent application of quality of life scales in children who have received cancer treatment will be useful in identifying psychosocial and somatic side effects and planning coping methods and rehabilitation interventions (Kantar, 2010). Taş and Yılmaz (2008) emphasized the importance of measuring the quality of life of pediatric oncology patients with the following words, "In addition to the biological needs during the treatment process, determining the social, psychological and emotional needs emerges by measuring the quality of life, thus contributing to the child's treatment". Solak (2010) says; "It becomes important to improve quality of life, coping skills and social support systems to maintain and increase the individual's adaptation to the medical condition".

Children are also exposed to stress due to reasons such as cancer diagnosis, complicated treatment protocols, medical tests, isolation, and long-term hospitalization (Love and Sabiston, 2011). In Ryden's (1977) stress model; It is suggested that if the stress that occurs during the adaptation phase to cancer is not reduced, the individual's energy will be depleted and fatigue may occur as a result. In Aistars' (1987) "Regulation Framework" theory, he sees "fatigue" as an energy deficit. This theory explains that the main cause of fatigue in cancer patients is stress, and that in addition to emotional stressors, physical stressors such as pain, infection and anemia are also effective in causing fatigue. Although stress does not directly cause cancer, it reduces the effects of chemotherapy and causes cancer to grow and progress through the sympathetic nervous system and hypothalamic-pituitary-adrenal axis (neuroendocrine) pathways. Stress increases inflammation, promotes angiogenesis and reduces the effectiveness of chemotherapy (Armaiz and Cole, 2012). It has

been shown that chronic stress can result in an immunosuppressive effect that prevents the body from initiating a timely and appropriate immune reaction (Morey et al., 2015). For this reason, it is important to identify the situations that cause the child's stress, to learn the symptoms of stress, to identify the coping methods that children use and to determine the methods they can use (Scruggs, 2009). In the Aistars model; supports that time management, meditation, exercise and patient education are useful in reducing stress-related fatigue (Aistars, 1987). Biobehavioral interventions such as yoga have the potential to reduce stress and disrupt cancer biology (Kiecolt and Benett, 2014). Today, Yoga is among the alternative and complementary treatment methods used in children (Aydın and Özgen, 2018). Yoga can be used as therapy for children with cancer, as well as helping to remove toxins accumulated during treatment and reducing the patient's tension and anxiety. By emphasizing comfortable and deep breathing during yoga practices for cancer patients, the flow of oxygen-rich blood to the cells is increased and toxins are removed. Asanas practiced during yoga; It stimulates and balances systems such as nervous, muscular, skeletal, respiratory, circulatory, endocrine and digestive systems.

Additionally, pranayamas applied in yoga, calm the mind and relax the body (Sharma, 2018). The Canadian and American Cancer Society describe yoga as a promising complementary therapy that may improve strength, flexibility, mobility, and cardiovascular health (American Cancer Society, 2020, Canada Cancer Society Complementary Therapies, 2019). Yoga is a holistic mind-set that includes multiple components such as postures and exercises that build physical strength and flexibility, breathing exercises to improve respiratory function, deep relaxation techniques to improve mental ability, meditation/mindfulness practices to reduce tension and stress and increase mind-body awareness (Butzer et al, 2015). The practice of yoga, which supports and strengthens the individual biopsychosocially, has a strong similarity with the nursing profession, which treats people biopsychosocially and emphasizes approaching people holistically (Karadağ and Kırca, 2019).

In a feasibility study investigating the effectiveness of yoga in children with brain tumors receiving outpatient treatment, at the end of a 5-week yoga program, there was a decrease in pain (0.0001), a decrease in headache (0.0005), an increase in appetite (0.0005), and better sleep (0.0003). A decrease in fatigue (0.007) and an increase in daily activity (0.0018) were observed, and they stated that yoga could be applied in children receiving chemotherapy and radiotherapy (Govardhan et al, 2019). In his study, Sharma (2018) stated; The main reason why cancer patients choose yoga is; He stated that yoga teaches patients "to be more connected to their bodies, to be calm, to reduce stress, to experience well-being, to strengthen themselves, and to improve their coordination and balance". This study aimed to examine the effect of yoga on the quality of life and cortisol levels, a stress level indicator, of pediatric oncology patients. Since it is the first randomized controlled yoga study conducted in the field of Pediatric Oncology Nursing in Turkey, it is important in terms of pioneering yoga studies to be carried out on future pediatric patients. The results of this study and future studies on yoga will help Child Health and Disease nurses to integrate yoga practice, which is applied to increase the quality of life and reduce the stress of children with oncology patients, into their care planning and to create children's yoga areas where yoga practices can be performed in the pediatric oncology services of hospitals.

2. METHOD

Aim

This study was conducted experimentally to investigate the effect of the Children's Yoga Program on the quality of life and salivary cortisol values of Pediatric Oncology patients.

Hypotheses

In the study, among the data collection tools, physical, emotional, social-school-emotional (psycho-social), functionality and children's cortisol levels, which are the sub-dimensions of the parent and child form of the Quality of Life Scale for Children (PedsQL), are parameters that may change at the end of the yoga program. Therefore, the hypotheses of the study were determined based on these parameters. The hypotheses in the study are as follows.

- H_1: There is a significant difference between the physical functionality pretest and posttest scores of the Control and Study groups in favor of the study group.
- H_2: There is a significant difference between the social functionality pretest and posttest scores of the Control and Study groups in favor of the study group.
- H_3: There is a significant difference between the emotional functionality pretest and posttest scores of the Control and Study groups in favor of the study group.
- H_4: There is a significant difference between the school functionality pretest and posttest scores of the Control and Study groups in favor of the study group.
- H_5: There is a significant difference between the psychosocial functionality pretest and posttest scores of the Control and Study groups in favor of the study group.
- H_6: There is a significant difference between the pretest and posttest total quality of life scores of the Control and Study groups in favor of the study group.
- H_7: There is a significant difference between the pre-test and post-test cortisol levels of the Control and Study groups in favor of the study group.

Place and Time the Research Was Conducted

The study was conducted with children who were hospitalized for treatment in the Pediatric Hematology-Oncology service at a hospital in Mersin between 19.01 2020 and 19.08.2020, and their parents who cared for them. In order to improve cognitive ability, volunteer children between the ages of 8-18, who did not have any other diseases accompanying their oncological disease, and who did not have any developmental disorders, and their parents were included in the study. Children whose eligibility to participate in the yoga program was approved by the doctor in charge of the Pediatric Hematology-Oncology unit participated in the study. Children were determined by the "simple random selection" method and formed the study and control groups. Study and control groups were created using the lottery method for randomization. At the end of the study, as a result of the power analysis made using the data obtained from the study; For the determined effect size, 5% margin of error and a total number of 60 samples (n1:30, n2:30), the power of the study was found to be 83.3%.

Dependent and Independent Variables

The dependent variables of the study are; The total and sub-dimension averages of the child and parent form of the children's quality of life scale constituted the children's cortisol levels, children's and parents' moods and future concerns. The independent variables of the study were determined as socio-demographic characteristics, medical diagnosis of the child, duration of diagnosis, reason for hospitalization, hospital stay and yoga knowledges.

Data Collection Tools

1. Survey Form

A survey form was used to learn the socio-demographic characteristics of the children participating in the study and their families. Survey questions include (parents' age, employment status, child's age, gender, mother/father's age, income level, what the child's diagnosis is, the reason for hospitalization (chemotherapy, new diagnosis, was the disease relapsed? was he hospitalized for the side effects of the disease? what). Questions such as (how long ago he was diagnosed, how long he was in the hospital, whether he went to school, whether he had any previous yoga experience, whether he had any knowledge about yoga)

2. Quality of Life Scale for Children (8-12 year old child and parent form, 13-18 year old child and parent form)

To evaluate the effectiveness of the children's yoga program on the quality of life of pediatric oncology patients, the 8-12 year old child and parent form and the 13-18 year old child and parent form of the Quality of Life Scale for Children (PedsQL) were used. This scale was designed for children aged 2-18 and was developed by Varni et al (2001). The Turkish validity and reliability of the quality of life scale was conducted by Üneri and Çakın Memik (2007) in healthy and sick children. The scale has a parent and child form prepared for the 8-12 age group. The parent form is filled in by the caregiver and the child form by the child included in the study, separately and simultaneously. The scale, developed for the 13-18 age group, also has a parent and adolescent form. The parent form is filled in by the caregiver and the adolescent form by the adolescent included in the study, separately and simultaneously. The scale, which consists of 23 items, is scored in 3 areas. Firstly, the total score of the scale is calculated. Secondly, the physical health total score. And thirdly, the psychosocial health total score which consists of calculating the item scores evaluating emotional, social and school functionality (Varni et al., 2001). Items are scored between 0-100. If the answer to the question is marked as "never", it receives 0=100 points, if it is marked as "rarely", it receives 1=75, if it is marked as "sometimes", it receives 2=50, if it is marked as "often", it receives 3=25, and if it is marked as "almost always", it receives 4=0 points. The total score is obtained by adding the points and dividing by the number of items completed. If more than 50% of the scale is not filled out, the scale is not evaluated. The higher the total score, the better the health-related quality of life is perceived. The most important features of the PedsQL are that it is short, can be completed in approximately 5-10 minutes, and is easy to administer and score by the researcher (Varni et al., 2001).

Varni et al. (2001) found in their study that the Cronbach α coefficient was α: .80 for the child, α: .88 for physical functions for the family, α: .83 for psychosocial functions for the child, and α: .86 for the family (Varni et al., 2001). Üneri and Çakın Memik. (2007) in their Turkish validity and reliability study; When the reliability coefficients of the 8-12 age group child and parent scale were examined, the Cronbach's coefficient was found to be α: .86 in the

child form test application and the parent form α: .84. When the internal consistency of the 13-18 age group child and parent form was evaluated, Cronbach's alpha coefficients ranged between 0.60 (school functionality score, adolescent form) and 0.87 (scale total score, parent form) and revealed that the Quality of Life Scale for Children is a scale applicable to Turkish children (Üneri and Çakın Memik, 2007).

1. Cortisol Kit

Before the yoga program started, cortisol values were measured from the saliva samples of both groups. The measurement was repeated for both groups after the 3-week (6 sessions) yoga program. Samples of the study and control groups were taken on an empty stomach in the morning, just before the yoga program. After rinsing their mouths with water, the children were told to collect their saliva in their mouths and take the cotton in the kit and leave it in their mouths for 2 minutes. The cotton in which their saliva was impregnated was placed back into the kit under sterile conditions, and after the lid was closed, a barcode with the names of the children was pasted on the kit. It was requested that the kits be delivered to the laboratory under appropriate conditions. This process was repeated immediately after the end of the program.

Collection of Data

The study was conducted as pre-test and post-test in order to reveal the effectiveness of the children's yoga program. Before the first yoga session, the parent and child caregivers in the study and control groups completed a quality of life inventory. In addition, a survey form containing the socio-demographic characteristics of the family, created by the researcher by reviewing the literature, was applied to the caregiver parent. The children's yoga program lasted 3 weeks, with 2 sessions per week. At the end of the 6th session, the quality of life scale was repeated to the parent and child. In addition, study and control groups were asked to keep a diary until the end of the yoga program, so that we could find out whether they were exposed to similar or different effects outside of the yoga intervention. And these diaries were read one by one at the end of the study to see whether the children were exposed to any effects other than yoga intervention. In addition, the children's cortisol levels, which are an indicator of stress level, were measured by taking a saliva sample. Saliva samples were taken from both groups of children (study and control) before the yoga program started, and the process was repeated for both groups of children at the end of the 3-week yoga program.

Children's Yoga Program

The yoga class we created for the children's yoga program consisted of a room arranged in the inpatient unit. Yoga sessions were 6 sessions, 2 sessions per week. The program was given by an expert yoga instructor who received the international "Yoga Alliance" approved child and adolescent yoga certificate. The content of the children's yoga program was created after the unit's responsible physiotherapist evaluated the suitability of each child. While creating yoga classes, children were divided into age groups and a yoga program was organized to suit the cognitive characteristics of that age group. Yoga was organized as a group lesson, with a maximum of 6 children in the group. Parents who wanted were able to participate in a yoga session with their children. The hygiene of the yoga class was ensured before each session and each participant was given a soft yoga mat. The lighting required in a standard yoga class was provided. The environment was illuminated with dim

light. Consisting of the components of Hatha Yoga (HY), one of the types of yoga known and widely practiced all over the world; Sessions consisting of asanas (yoga postures), pranayamas (breathing techniques), relaxation, relaxation exercises and meditation were prepared. Sessions are 45 minutes; The first 15 minutes are for those new to yoga; mental and physical preparation; asanas and pranayamas were taught, the next 30 minutes consisted of drama, breathing exercises and asanas, and the last 15 minutes consisted of relaxation techniques (imaginary journey) and meditation. At the end of the yoga session; Children were allowed to verbally express what they felt, and they were mostly asked which postures and breathing techniques they liked most, or which part of the yoga program they liked the most. In the next session, a yoga program was prepared, focusing on the section the children liked. Again, at the end of the session, brief information was given about the content of the next session. According to the principle of yoga; In yoga classes, children were not in competition; children were encouraged to do yoga.

Evaluation of Data

Statistical analyzes were performed using the package program SPSS (IBM SPSS Statistics 24). Frequency tables and descriptive statistics were used to interpret the findings. Parametric methods were used for measurement values suitable for normal distribution. In accordance with parametric methods, the "Independent Sample-t" test (t-table value) method was used to compare the measurement values of two independent groups, and the "Paired Sample-t" test (t-table value) method was used to compare the measurement values of two dependent groups. Non-parametric methods were used for measurement values that did not comply with normal distribution. In accordance with non-parametric methods, the "Mann-Whitney U" test (Z-table value) was used to compare the measurement values of two independent groups, and the "Wilcoxon" test (Z-table value) method was used to compare the measurement values of two dependent groups. Normal "Spearman" correlation coefficient was used to examine the relationship between non-distributed measurement values. In examining the relationships between two qualitative variables, "continuity correction" or "Pearson-$\chi 2$" cross-tabulations were used according to expected value levels.

Ethical Aspect of Research

Yoga intervention was applied to the study groups, and immediately after the end of the study, a program consisting of meditation audio recordings was distributed to the children in the control group and they were made to listen to the meditation. In order to conduct the research, written approval was obtained from the ethics committee, institutional permission from the hospital where the research was conducted, and written permission from the parents of the children included in the research.

Limitations of the Research

The limitations of the study were that the participating children knew the Turkish language, did not have any other accompanying diseases, did not have any developmental disorders, and were approved by the doctor in charge of the Pediatric Oncology unit to be eligible to participate in the yoga program.

Strengths of the Research

While more studies with a high level of evidence could be found on the effectiveness of pharmacological methods with oncology children, it was seen that the number of studies with a high level of evidence measuring the effectiveness of complementary health approaches was insufficient. The strengths of the study were that the study was conducted in an evidence-based and experimental manner, and that the study was completed smoothly under these conditions, considering the determination of the groups, strict adherence to mask-distance-hygiene rules, curfews, and transportation difficulties of children and parents, since the date of the study coincided with the pandemic period.

3. RESULTS

According to the study/control group, no statistically significant difference was found in terms of parent's age (years), child's age (years), duration of diagnosis (months) and duration of hospitalization (days) ($p>0.05$). It was determined that the groups were similar in terms of the characteristics specified according to the experimental/control group (Table 1).

Table 1. Comparison of socio-demographic characteristics according to study/control group

Variable	Study group (n=30)		Control group (n=30)		Statistical analize*
	$\bar{X} \pm S.S.$	Median [Min-Max]	$\bar{X} \pm S.S.$	Median [Min-Max]	Posibility
Parent's age (year)	43.20±9.85	42.5 [24.0-68.0]	39.63±10.78	38.0 [23.0-61.0]	t=1.338 p=0.186
Child's age (year)	12.03±3.35	12.0 [8.0-17.0]	13.53±3.63	14.0 [8.0-18.0]	Z=-1.691 p=0.091
Diagnosis time (month)	20.17±39.63	3.5 [1.0-144.0]	30.87±59.12	6.0 [1.0-194.0]	Z=-0.768 p=0.443
Hospital stay (day)	8.33±9.81	4.0 [1.0-38.0]	6.50±11.67	3.0 [1.0-60.0]	Z=-1.045 p=0.296

* "Independent Sample-t" test (t-table value) statistics were recorded when comparing two independent measurement values with normal distribution. "Mann-Whitney U" test (Z-table value) statistics were recorded when comparing two independent measurement values that did not have a normal distribution.

A statistically significant difference was found in terms of child report physical health scores of the study group according to the processes ($t=-4.223$; $p=0.000$). The last measurement physical health scores of the study group were found to be significantly higher than the first measurement. A statistically significant difference was found in the control group in terms of child report physical health scores according to the processes ($t=2.221$; $p=0.034$). The last measurement physical health scores of the control group were significantly lower than the first measurement (Table 2).

A statistically significant difference was found in terms of child report emotional functioning scores of the study group according to the processes ($Z=-3.933$; $p=0.000$). The last measurement emotional functioning scores of the study group were found to be significantly higher than the first measurement. While the child report emotional functioning scores of the control group according to the processes were lower in the posttest compared to the first test, this decrease was not statistically significant ($p>0.05$) (Table 2).

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A statistically significant difference was found in the study group in terms of child report social functionality scores according to the processes (Z=-2.604; p=0.009). The last measurement social functionality scores of the study group were found to be significantly higher than the first measurement. While the child report social functioning scores of the control group according to the processes were higher in the posttest compared to the first test, this increase was not statistically significant (p>0.05) (Table 2).

No statistically significant difference was found in the study group in terms of child report school functionality scores according to processes (p>0.05). The last measurement social functionality scores of the study group were found to be higher than the first measurement. But it was not statistically significant. A statistically significant difference was found in the control group in terms of child report school functionality scores according to the processes (t=-2.394; p=0.023). The last measurement school functionality scores of those in the control group were found to be significantly lower than the first measurement (Table 2). A statistically significant difference was found in terms of child report psycho-social functionality scores of the study group according to the processes (t=-3.685; p=0.001). The last measurement psychosocial health scores of the study group were found to be significantly higher than the first measurement. While the child report psychosocial functioning scores of the control group according to the processes were lower in the posttest compared to the first test, this decrease was not statistically significant (p>0.05) (Table 2). A statistically significant difference was found in terms of the child report scale total scores of the study group according to the processes (Z=-3.487; p=0.000). The final measurement scale total scores of the study group were found to be significantly higher than the first measurement. While the child report scale total scores of the control group according to the processes were lower in the posttest compared to the first test, this decrease was not statistically significant (p>0.05) (Table 2).

Table 2. Comparison of child report-PedsQL according to study/control group

PedsQL Child report	**Study group (n=30)**		**Control group (n=30)**		**Statistical analysis* Probability**
	$\bar{X} \pm S.S.$	**Median [Min-Max]**	$\bar{X} \pm S.S.$	**Median [Min-Max]**	
Physical health					
First measurement	47.19±18.70	48.4 [9.4-84.4]	43.75±17.73	46.9[0.0-71.9]	t=0.731 p=0.468
Last measurement	66.67±13.49	68.8 [25.0-87.5]	31.98±16.89	31.3 [6.3-59.4]	t=8.788 **p=0.000**
Analysis/Probability	t=-4.223 **p=0.000**		t=2.221 **p=0.034**		
Emotional Functioning					
First measurement	56.67±17.09	55.0 [25.0-100.0]	52.33±14.06	52.5 [20.0-80.0]	t=1.072 p=0.288
Last measurement	78.83±14.54	80.0 [40.0-100.0]	50.67±23.55	55.0 [5.0-90.0]	t=5.573 **p=0.000**
Analysis/Probability	Z=-3.933 **p=0.000**		Z=-0.206 p=0.837		

Social Functioning					
First measurement	77.50±18.84	80.0 [20.0-100.0]	58.83±16.85	57.5 [30.0-100.0]	Z=-3.879**p=0.000**
Last measurement	88.50±11.31	90.0 [55.0-100.0]	68.00±22.38	77.5 [5.0-100.0]	Z=-4.397**p=0.000**
Analysis/Probability	Z=-2.604 **p=0.009**		Z=-1.678 p=0.093		
School Functioning					
First measurement	46.00±22.41	50.0 [5.0-85.0]	47.33±20.67	50.0 [0.0-100.0]	t=-0.240 p=0.812
Last measurement	51.83±14.94	50.0 [15.0-85.0]	33.17±22.87	32.5 [0.0-75.0]	t=3.742 **p=0.000**
Analysis/Probability	t=-1.069 p=0.294		t=2.394 **p=0.023**		
Psychosocial Functioning					
First measurement	60.06±15.44	60.8 [28.3-91.7]	52.83±14.59	52.5 [23.3-80.0]	t=1.862 p=0.068
Last measurement	73.06±10.14	71.7 [43.3-91.7]	50.61±18.31	46.7 [5.0-80.0]	t=5.872 **p=0.000**
Analysis/Probability	t=-3.685 **p=0.001**		t=0.443 p=0.661		
Total PedsQL					
First measurement	55.58±15.06	57.1 [22.8-77.2]	49.67±13.71	48.4 [15.2-77.2]	Z=-1.932p=0.053
Last measurement	70.83±10.22	70.7 [37.0-88.0]	44.13±16.77	38.6 [10.9-72.8]	Z=-5.407**p=0.000**
Analiz/Olasılık	Z=-3.487 **p=0.000**		t=1.175 p=0.249		

*In the comparison of measurement values of two independent groups with normal distribution, “Independent Sample-t” test (t- table value); “Paired Sample” test (t-table value) statistics were used to compare the measurement values of two dependent groups. “Mann-Whitney U” test (Z-table value) in comparing the measurement values of two independent groups that do not have a normal distribution; “Wilcoxon” test (Z-table value) statistics were used to compare the measurement values of two dependent groups.

Tablo 3. Çalışma/kontrol grubuna göre ebeveyn raporu-ÇİYKÖ karşılaştırılması

PedsQL Parental report	**Study group (n=30)**		**Control Group (n=30)**		
	$\bar{X} \pm S.S.$	**Medyan [Min-Max]**	**$\bar{X} \pm S.S.$**	**Medyan [Min-Max]**	
Physical health					
First measurement	47.60±19.83	45.3 [3.1-84.4]	44.58±19.83	46.9 [0.0-78.1]	t=0.590 p=0.557
Last measurement	68.02±15.78	70.3 [15.6-90.6]	30.63±14.27	34.4 [6.3-62.5]	Z=-6.007**p=0.000**
	Z=-3.593 **p=0.000**		t=2.596 **p=0.015**		
Emotional Functioning					
First measurement	53.00±17.20	50.0 [20.0-90.0]	51.83±18.31	55.0 [20.0-85.0]	t=0.254 p=0.800
Last measurement	80.50±16.37	82.5 [30.0-100.0]	38.83±21.04	37.5 [10.0-85.0]	Z=-5.847**p=0.000**
Analysis/Probability	Z=-3.890 **p=0.000**		t=2.235 **p=0.033**		
Social Functioning					
First measurement	72.67±19.06	72.5 [30.0-100.0]	55.33±20.84	52.5 [20.0-100.0]	t=3.361 **p=0.001**
Last measurement	85.83±9.83	87.5 [55.0-100.0]	61.83±16.84	60.0[25.0-85.0]	Z=-5.372**p=0.000**
Analysis/Probability	Z=-2.589 **p=0.010**		t=-1.317 p=0.198		
School Functioning					
First measurement	45.33±20.76	45.0 [5.0-90.0]	47.67±20.37	50.0 [5.0-100.0]	t=-0.439 p=0.662
Last measurement	49.00±15.05	45.0 [20.0-70.0]	24.83±20.06	27.5 [0.0-65.0]	Z=-4.421**p=0.000**
Analysis/Probability	Z=-0.734 p=0.463		Z=-3.636 **p=0.000**		
Psychosocial Functioning					
First measurement	57.00±14.91	56.7 [26.7-90.0]	51.61±16.12	47.5 [16.7-86.7]	t=1.344 p=0.184
Last measurement	71.78±11.83	74.2 [38.3-88.3]	41.83±16.03	41.7 [16.7-76.7]	t=8.230 **p=0.000**
Analysis/Probability	t=-3.866 **p=0.001**		t=2.231 **p=0.034**		
Total – PedsQL					
First measurement	53.73±14.29	52.7 [18.5-81.5]	49.17±15.28	48.4 [10.9-83.7]	t=1.195 p=0.237
Last measurement	70.47±11.83	71.2 [30.4-85.9]	37.93±13.96	35.9 [18.5-71.7]	Z=-6.021**p=0.000**
Analysis/Probability	Z=-3.547 **p=0.000**		t=2.615 **p=0.014**		

* "Independent Sample-t" test (t-table value) were used when comparing the measurement values of two independent groups with normal distribution; "Paired Sample" test (t-table value) statistics were used to compare the measurement values of two dependent groups. "Mann-Whitney U" test (Z-table value) in comparing the measurement values of two independent groups that do not have a normal distribution; "Wilcoxon" test (Z-table value) statistics were used to compare the measurement values of two dependent groups.

Table 3. Parental report-PedsQL comparison by study/control group

PedsQL Parental report	**Study group (n=30)**		**Control group (n=30)**		**Statistical analysis* Probability**
	$\bar{x} \pm s.s.$	**Median [Min-Max]**	$\bar{x} \pm s.s.$	**Median [Min-Max]**	
Physical health					
First measurement	47.60±19.83	45.3 [3.1-84.4]	44.58±19.83	46.9 [0.0-78.1]	t=0.590 p=0.557
Last measurement	68.02±15.78	70.3 [15.6-90.6]	30.63±14.27	34.4 [6.3-62.5]	Z=-6.007**p=0.000**
Analysis/Probability	Z=-3.593 **p=0.000**		t=2.596 **p=0.015**		
Emotional Functioning					
First measurement	53.00±17.20	50.0 [20.0-90.0]	51.83±18.31	55.0 [20.0-85.0]	t=0.254 p=0.800
Last measurement	80.50±16.37	82.5 [30.0-100.0]	38.83±21.04	37.5 [10.0-85.0]	Z=-5.847**p=0.000**
Analysis/Probability	Z=-3.890 **p=0.000**		t=2.235 **p=0.033**		
Social Functioning					
First measurement	72.67±19.06	72.5 [30.0-100.0]	55.33±20.84	52.5 [20.0-100.0]	t=3.361 **p=0.001**
Last measurement	85.83±9.83	87.5 [55.0-100.0]	61.83±16.84	60.0 [25.0-85.0]	Z=-5.372 **p=0.000**
Analysis/Probability	Z=-2.589 **p=0.010**		t=-1.317 p=0.198		
School Functioning					
First measurement	45.33±20.76	45.0 [5.0-90.0]	47.67±20.37	50.0 [5.0-100.0]	t=-0.439 p=0.662
Last measurement	49.00±15.05	45.0 [20.0-70.0]	24.83±20.06	27.5 [0.0-65.0]	Z=-4.421**p=0.000**
Analysis/Probability	Z=-0.734 p=0.463		Z=-3.636 **p=0.000**		
Psychosocial Functioning					
First measurement	57.00±14.91	56.7 [26.7-90.0]	51.61±16.12	47.5 [16.7-86.7]	t=1.344 p=0.184
Last measurement	71.78±11.83	74.2 [38.3-88.3]	41.83±16.03	41.7 [16.7-76.7]	t=8.230 **p=0.000**
Analysis/Probability	t=-3.866 **p=0.001**		t=2.231 **p=0.034**		
Total – PedsQL					
First measurement	53.73±14.29	52.7 [18.5-81.5]	49.17±15.28	48.4 [10.9-83.7]	t=1.195 p=0.237

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Last measurement	70.47±11.83	71.2 [30.4-85.9]	37.93±13.96	35.9 [18.5-71.7]	Z=-6.021 **p=0.000**
Analysis/Probability	Z=-3.547 **p=0.000**		t=2.615 **p=0.014**		

*Independent Sample-t test (t-table value) when comparing the measurement values of two independent groups with normal distribution; "Paired Sample" test (t-table value) statistics were used to compare the measurement values of two dependent groups. "Mann-Whitney U" test (Z-table value) in comparing the measurement values of two independent groups that do not have a normal distribution; "Wilcoxon" test (Z-table value) statistics were used to compare the measurement values of two dependent groups.

A statistically significant difference was found in terms of parent-reported physical health scores of the study group according to the processes (Z=-3.593; p=0.000). The last measurement physical health scores of the study group were found to be significantly higher than the first measurement. A statistically significant difference was found in terms of parent-reported physical health scores of the control group according to the processes (t=2.596; p=0.015). The last measurement physical health scores of the control group were significantly lower than the first measurement (Table 3).

A statistically significant difference was found in terms of parent-reported emotional functioning scores of the study group according to the processes (Z=-3.890; p=0.000). The last measurement emotional functioning scores of the study group were found to be significantly higher than the first measurement. A statistically significant difference was found in terms of parent-reported emotional functioning scores of the control group according to the processes (t=2.235; p=0.033). The last measurement emotional functioning scores of those in the control group were found to be significantly lower than the first measurement (Table 3).

A statistically significant difference was found in terms of parent-reported social functionality scores of the study group according to the processes (Z=-2.589; p=0.010). The last measurement social functionality scores of the study group were found to be significantly higher than the first measurement. While the parent report of social functioning in the control group according to the processes was higher in the posttest compared to the first test, this increase was not statistically significant (p>0.05) (Table 3).

While the posttest of parent report of school functionality in the study group according to the processes was higher than the first test, this increase was not statistically significant (p>0.05). A statistically significant difference was found in terms of parent-reported school functionality scores of the control group according to the processes (Z=-3.636; p=0.010). The last measurement school functionality scores of those in the control group were found to be significantly lower than the first measurement (Table 3).

A statistically significant difference was found in terms of parent-report psychosocial health scores of the study group according to the processes (t=-3.866; p=0.001). The last measurement psychosocial health scores of the study group were found to be significantly higher than the first measurement. A statistically significant difference was found in terms of parent-reported psychosocial health scores of the control group according to the processes (t=2.231; p=0.034). The last measurement psychosocial health scores of those in the control group were found to be significantly lower than the first measurement (Table 3).

A statistically significant difference was found in terms of parent report total scale scores of the study group according to the processes (Z=-3.547; p=0.000). The last measurement total-scale scores of the study group were found to be significantly higher than the first measurement (Table 3).

A statistically significant difference was found in terms of parent-report total scale scores of those in the control group according to the processes (t=2.615; p=0.014). The last measurement total-scale scores of those in the control group were found to be significantly lower than the first measurement (Table 3).

Table 4. Examination of child–parent report PedsQL reliability coefficient by groups

PedsQL	*Madde sayısı*	**Study group (n=30)**	**Control group (n=30)**
		Cronbach-α katsayısı	*Cronbach-α katsayısı*
Child Report			
First measurement	23	0.904	0,917
Last measurement	23	0.912	0,943
Parent Report			
First measurement	23	0.888	0,921
Last measurement	23	0,939	0,926

It was determined that the child and parent report – PedsQL answers given in the study/control group were highly reliable (Table 4)

Table 5. Comparison of the child's cortisol level in terms of processes according to the study/control group

Cortisol level	**Study group (n=30)**		**Control group (n=30)**		**Statistical analysis* Probability**
	$\bar{X} \pm S.S.$	**Median [Min-Max]**	$\bar{X} \pm S.S.$	**Median [Min-Max]**	
First measurement	3.18±2.11	2.8	2.45±2.15	1.8	Z=-1.737
		[0.4-8.8]		[0.5-9.9]	p=0.082
Last measurement	2.26±1.92	1.4	2.64±2.08	1.8	Z=-0.850
		[0.2-8.3]		[0.5-7.5]	p=0.395
Analysis/ Probability	Z=-2.026		Z=-0.793		
	p=0.043		p=0.428		

No statistically significant difference was found in terms of first measured cortisol level compared to the study/control group (p>0.05). No statistically significant difference was found in terms of last measurement cortisol level according to the study/control group (p>0.05) (Table 5).

According to the processes, the last measured cortisol levels of the children in the study group were found to be significantly lower than the first measured cortisol levels (Z=-2.026; p=0.043). According to the processes, the last measured cortisol levels of the children in the control group were higher than the first measured cortisol levels. However, this increase was not statistically significant (p>0.05).

3. DISCUSSION

Discussion Of The Descriptive Characteristics Of The Study And Control Groups

The most common types of childhood cancers are; leukemia, central nervous system tumors and lymphomas(Schepers, 2017). In this study, in accordance with the literature; It was determined that most of the children in the study (53.4%) and control (53.3%) groups were diagnosed with leukemia. After leukemia, lymphoma was the most common disease in the study and control groups (13.3%). 17 (56.7%) of the children in the study group were female and 13 (43.3%) were male, and 10 (33.3%) of the control group children were female and 20 (66.7) were male. The mean age of the study group children was 12.03±3.35 years, while the mean age of the control group was 13.53±3.63. In a yoga feasibility study conducted on children with cancer receiving chemotherapy, the ages of the children ranged from 11 to 18 years and the average age was reported as 15.1 (Stein et al., 2019). While the proportion of children receiving chemotherapy in the study group was 63%, this rate was 43.3% in the control group (Tablo 4.2). Most of the children in both groups had been admitted to the hospital to receive chemotherapy. Studies have shown that the quality of life of children with cancer who receive chemotherapy treatment is lower than that of children who receive other treatment methods (Vohra & Marmot. 2015; Beaty et. al, 2015).

Discussion Of The Mean Scores Of The Study And Control Group Child And Parent Report

In the study, it was observed that at the end of the yoga practice, the PedsQL total score of the study group increased from 55.58±15.06 to 70.83±10.22 points and this difference was significant. In another study that reached similar results to our study, it was conducted with 18 HIV(+) children as a single group pre-test and post-test, and they aimed to see the changes in quality of life, CD4 cell count indicating immune parameters and viral load with a 6-month yoga intervention and found that the total score of quality of life was increased. They reported that it increased from 1439.7 ± 346.22 to 1677.1 ± 280.57 points and that this difference was significant ($p = 0.013$), and that there was a significant increase in the blood CD4 cell count and an improvement in their general health status after the yoga intervention (Chandra et al., 2019). Posttest PedsQL child and parent report total and subscale score averages of the study group were found to be significantly higher than the first measurement ($p<0.05$). It was determined that the child-parent reports were consistent with each other in terms of the first measurement and the last measurement (Table 4.8), and that the answers given to the PedsQL in the child and parent reports of the study and control groups were highly reliable ($Z=-2.026$; $p=0.043$). (Tablo 4.5). In a similar study conducted by Orsey et al. (2017); After 8 weeks of yoga intervention, there was a significant increase ($p= 0.03$) in the total score of the quality of life scale child form and emotional and social sub-dimensions of this scale, while there was no significant change in the quality of life scale parent form. In our study, parents' notice of the positive changes in children's quality of life and reflecting this in the parent report may have been due to the fact that they were able to participate in yoga sessions with their children and observe their children during the sessions. It was seen that the lowest first test score obtained from the sub-dimensions of the scale was the school sub-dimension in the parent and child form in both groups (Tablo 4.6). In a study conducted to evaluate the quality of life of children with cancer; As in this study, it was determined that children's quality of life scores were low, but the lowest score obtained from the sub-dimensions of the scale was determined to be the emotional sub-dimension (Schultz et al., 2017).

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In a study in which individualized yoga was applied to 11 children between the ages of 7-18 who received chemotherapy treatment for 3 weeks; They reported that they observed fatigue, decrease in nausea, and increase in physical activity levels due to chemotherapy (Diorio et al., 2015). Similar to the study, in this study, it was seen that there was a significant increase in the mean scores of the first test and post-test physical functioning sub-dimensions of the children in the study group with yoga practice (Tablo 4.6). In addition, parents stated that their children in the yoga group were more energetic, more positive, more social and more willing to engage in physical activities after yoga sessions. It was seen that the proportion of parents in the control group who felt depressed and unhappy in the first test and those who felt anxious and pessimistic about their children's future increased in the posttest, while the proportion of parents in the study group who felt depressed and unhappy in the first test and those who felt anxious and pessimistic about their children's future decreased in the posttest. For children with chronic health conditions, sleep quality has emerged as an important component of quality of life (Zupanec et al., 2010). In our study, it was observed that children fell asleep on their mats during yoga sessions, especially during meditation exercises. The children who fell asleep were not woken up at the end of the session at the request of the parents, and especially after the 3rd session of yoga, the parents stated that their children could fall asleep more easily than before the program. This study was consistent with other research on sleep changes after yoga participation. In a study Govardhan et. al. (2019) conducted in children with brain tumors who received radiotherapy and chemotherapy; After 4 weeks of yoga intervention, the children decreased in pain intensity (0.0001), improved headache (0.0005), increased appetite (0.0005), decreased fatigue (0.007), significantly increased daily living activity (0.0018) and children could sleep better (p=0.0003).

Discussion Of The Child's Cortisol Level İn Terms Of Processes According To The Study And Control Group

Cancer can adversely affect psychological, social and physical health from diagnosis. Children are exposed to many stressors such as medical tests, complicated treatment protocols, cancer diagnosis, isolation, and long-term hospitalization (Love C. 2011). Many factors such as whether the existing disease is acute or chronic, the age of the child, and the length of stay in the hospital affect the child's response to the cancer process (Gündüz &Yüksel., 2016). In Ryden's (Ryden 1977) model, it is suggested that unless stress is reduced, existing energy will be depleted and fatigue may occur. In Aistars' (1987) theory of the "Regulation Framework", fatigue is an energy deficit. It is more comprehensive than Ryden's model. In this model, stress is defined as the main cause of fatigue in cancer patients, and explains that in addition to emotional stressors, physical stressors such as infection, pain, and anemia are also effective in the occurrence of fatigue. Çırak (2015) stated that hospitalization and illness create a certain stress in the individual, but the dimensions of this stress are higher in children. In this study, when the duration of hospital stay of the study and control group children was examined; The duration of hospital stay in the study group was 8.33±9.81 days and the control group was 6.50±11.67 days. In a study, during the hospitalization of children with cancer; They stated that they felt fear (75.3%), shame (70%), anger (68.7%), anxiety/sadness (64%), hope (57.3%), helplessness (48.7%) and grief (40%) (Kalaycı. 2019)). Other studies have shown that emotions affect the life and quality of life of a child with cancer (Orsey et al., 2015; Behestipoor et al., 2015).

In a systematic review, a number of studies were examined and in these studies; stress negatively affects cellular immunity (Cohen & Rabin., 1998; Segerstrom & Miller., 2004) and that an impaired immune system may facilitate tumor development (Sephton et al., 2000;

Cohen & Rabin., 1998) and studies have been found stating that the practice of yoga/meditation can retard the growth of tumors (Meares, 1976; Meares, 1978; Meares 1979).

One of the aims of our study was to see changes in cortisol levels, which is a marker of stress, at the end of the yoga program. The last measurement cortisol levels of the study group were found to be significantly lower than the first measurement cortisol levels (Z=-2.026; p=0.043). In the study group, when the differentiation in cortisol values was examined; It was observed that the mean cortisol values decreased from 3.18±2.11 to 2.26±1.92 (Tablo 4.10). In the control group, the mean cortisol values increased from 2.45±2.15 to 2.64±2.08. However, the change in cortisol values was not significant (p>0.05). In order to find out whether the children in the study and control groups were exposed to a situation that could have similar or different effects, the children were asked to keep a diary until the yoga program was over. When the diaries of the children are examined; Apart from the yoga intervention, there was no situation that could affect the children similarly or differently. This study was consistent with other research on changes in cortisol after yoga participation. In the literature, similarly, Butzer et. al. (2015) After a 10-week yoga session for healthy children in the second and third grades of primary school; The first measured cortisol level was mean = 0.18 ± 0.09 µg/dL, while the mean cortisol level after the session was = 0.12 ± 0.06 µg/dL. While the first measured cortisol level in the third grade of primary school was mean = 0.14 + 0.05, the cortisol level after the session was mean = 0.14 + 0.07. Pascoe et.al. (2017) in a meta-analysis investigating the systemic effects of yoga, they found 5 studies reporting a significant decrease in evening salivary cortisol (−0.88nmol/L) after yoga interventions (p = 0.048, I2= 14.95%). In the same study; 3 studies were examined in which there was no significant decrease in salivary cortisol levels 30 minutes after waking up in the morning (p = 0.30, I2 = 0%). Felver et al. (2014) reported that 9th and 10th grade students in their study comparing a 3-week yoga session with a standard physical education class; They reported that children who took yoga classes stated that their symptoms of nervousness, depression and fatigue were "reduced" compared to children who took physical education classes. Sarkissian et. al. (2018) stated that the yoga program had a significant effect on reducing the stress level in their study in which they applied the "Yoga for Youth" for young people to 30 students in the school age group between the ages of 9-14 for 10 weeks.

Various studies on the duration and frequency of sessions were found in the literature. A systematic review evaluating the practice and effectiveness of yoga for children and adolescents; yoga intervention time; from a single session to 14 weeks, frequency; It consisted of studies ranging from once a week to daily, and the intervention time ranged from 10 minutes to 2 hours (James Palmer et. al., 2020). Wurz et al. (2014) found a 12-week, twice-weekly yoga intervention applicable to outpatient pediatric oncology patients aged 5-17 years. In a feasibility study investigating the effectiveness of yoga in children with brain tumors receiving outpatient treatment, at the end of a 5-week yoga program, a decrease in pain (0.0001), a decrease in headache (0.0005), an increase in appetite (0.0005), better sleep (0.0003), a decrease in fatigue (0.007) and an increase in daily activity (0.0018) were observed, and they stated that yoga was applicable in children receiving chemotherapy and radiotherapy (Govardhan et. al., 2019). In this study, Hatha Yoga (HY), one of the most widely known and widely practiced yoga types, and pranayama (breathing exercises), asanas and meditation, which are among its components, were applied. The yoga program lasted 3 weeks (6 sessions), 45 minutes twice a week. During the session, they were free to choose a position that they were physically comfortable in, and there were no physical restrictions for the children. Considering pediatric attention spans; In this study, 45 minutes of sessions were appropriate for children.

4. CONCLUSION AND RECOMMENDATIONS

- It was observed that the yoga program applied to pediatric oncology patients improved the quality of life (physical, emotional, social and school functionality) and contributed to the decrease in children's salivary cortisol values. And the program was found to be a feasible and safe exercise program for pediatric oncology patients. In order to help improve the quality of life and reduce the stress of pediatric oncology patients, it is recommended that Child Health and Disease Nurses integrate yoga practice into their care plans while caring for their patients, and that children's yoga areas where yoga practices can be done are created in the pediatric oncology services of hospitals.
- It was observed that the lowest first test score obtained from the sub-dimensions of the scale was the school sub-dimension in the parent and child form. For this reason, school support programs should be provided to the Pediatric Oncology Departments of hospitals.
- Since a Pandemic was declared during the date of our study, our yoga sessions were limited in terms of both duration and frequency. Increasing the duration and frequency of yoga may provide better results for future studies, but yoga interventions should be planned taking into account practicality and pediatric attention spans, and it is recommended to conduct feasibility studies on the duration and frequency of yoga and the applicability of yoga in different disease situations.
- While more studies with a high level of evidence could be found on the effectiveness of pharmacological methods with oncology children, it was seen that the number of studies with a high level of evidence measuring the effectiveness of complementary health approaches was insufficient.
- It is recommended to conduct different randomized controlled studies in which yoga is used in the field of Child Health, with a large sample group, comparing yoga with other complementary therapy methods, examining the long-term effects of yoga, and with a higher number of sessions.
- Since this study is the first yoga practice conducted in the field of Pediatric Oncology Nursing in Turkey, it will be useful in planning future yoga studies for pediatric patients.
- In future studies, it is recommended that nurses plan yoga interventions with parent and child participation, together with children with cancer and their families, to improve the quality of life and reduce the stress of the caring parent in order to maintain family-centered care.
- It is important for future studies to focus on the effect of yoga on different childhood diseases and to compare different types of yoga. This will pave the way for planning specific yoga programs for certain diseases.
- There are not enough evidence-based studies to recommend a particular type of yoga for children. However, "Hatha yoga", which includes physical yoga postures, breathing exercises (paranayama), and meditation practices, was used in this study, so it is recommended to conduct studies investigating the effectiveness of interventions with different types of yoga in future yoga interventions.

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Conflict of interest: The author(s) of the article have no personal or financial interests within the scope of the study. There is no conflict.

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