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Research Article

An Investigation of the Quality of Life Regarding Some Demographic Charecteristics of Children with Cancer Aged Between 2 and 7 Years

İki-Yedi Yaş Arasındaki Kanserli Çocukların Yaşam Kalitelerinin Çocuklara Ait Bazı Özellikler Açısından İncelenmesi

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ABSTRACT

Objective: *This is a descriptive study investigating the quality of life among hospitalized children aged 2-7 years with cancer by some of their characteristics.*
Method: *The sample of the present study consisted of the mothers of children aged 2-7 years who were hospitalized in oncology clinics of two university hospitals in Ankara, diagnosed with cancer at least six months ago, and had no major physical and motor development disorders. Accordingly, 35 voluntary mothers were included in the study, and their written consent was obtained. The data were collected with a "Demographic Information Form" and the "Parent-Proxy Report of the Pediatric Quality of Life Inventory (PedsQL) 3.0 Cancer Module," which was developed by Varni et al. (1999) and whose validity and reliability study was conducted by Yıldız Kabak et al. (2016) for children aged 2-7 years.*
Results: *Mean scores of the girls, those aged 49-84 months and those diagnosed with cancer at the age of 49-78 months, children of mothers who did not meet any child development specialists (CDSs), and children of mothers who did not meet and have any idea about CDSs during treatment were high on the subscales of pain and hurt, cognitive problems, worry, and perceived physical appearance, respectively.*
Conclusion: *The findings revealed that age and gender of the child, the age of diagnosis, and meeting any CDSs were factors affecting the quality of life of children with cancer.*

Keywords: *Child with cancer, quality of life, mother, early childhood, child development specialist*

ÖZ

Amaç: *Hastanede yatan iki-yedi yaş arasındaki kanserli çocukların yaşam kalitelerinin çocuklara ait bazı özellikler açısından incelenmesi amacıyla betimsel olarak yapılmıştır.*
Yöntem: *Araştırmanın çalışma grubuna, Ankara'da bulunan iki üniversite hastanesinin onkoloji servisinde yatan, kanser tanısını en az altı ay önce almış, majör fizik ve motor gelişim bozukluğu olmayan, iki-yedi yaşlar arasındaki çocukların anneleri oluşturmuştur. Bu doğrultuda, gönüllü olarak katılan 35 anne araştırmaya dâhil edilmiş ve yazılı onamları alınmıştır. Araştırmanın verileri "Genel Bilgi Formu" ve Varni ve ark. (1999) tarafından geliştirilen ve iki-yedi yaşları arasındaki çocuklarda geçerlik ve güvenirliği Yıldız Kabak ve ark. (2016) tarafından yapılan "Çocuklar İçin Yaşam Kalitesi Ölçeği (ÇİYKÖ) 3.0 Kanser Modülü Ebeveyn Formu" ile toplanmıştır.*
Bulgular: *Elde edilen bulgulara göre, kızların ağrı ve acı; 24-48 aylık olan çocukların bulantı ve endişe; 49-84 aylıkların bilişsel sorunlar yaşama; kanser tanısını 49-78 aylıkken almış olanların bilişsel sorunlar; çocuk gelişimciyi tanımayan annelerin çocuklarının endişe; tedavi sürecinde çocuk gelişimci ile karşılaşmayan ve çocuk gelişimciyi bilmeyen annelerin çocuklarının algılanan fiziksel görünüm alt boyutlarından aldıkları puan ortalamalarının anlamlı düzeyde yüksek olduğu bulunmuştur (p<0,05).*
Sonuç: *Araştırmadan elde edilen bulgulara göre, çocuğun yaşı, çocuğun cinsiyeti, tanı alma yaşı ve çocuk gelişimcilerle karşılaşma durumunun kanserli çocukların yaşam kalitesini etkileyen faktörler olduğu belirlendi.*

Anahtar kelimeler: *Kanserli çocuk, yaşam kalitesi, anne, erken çocukluk, çocuk gelişimci*

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INTRODUCTION

There are many definitions for quality of life, which is an interdisciplinary concept that is investigated in many fields, such as psychology, social work, health, sociology, economics, and political science (1). According to the World Health Organization (WHO), the quality of life is "how individuals perceive their positions in life in relation to their goals, expectations, standards, and concerns in the context of their culture and value system" (2). The quality of life, which can be interpreted as "satisfaction" perception of sick people in proportion to their existing functional levels, is a multidimensional concept that includes interpretations about the symptoms and psychological and social aspects associated with the person's disease status or treatment (3).

It is known that chronic diseases, such as cancer, affect the quality of life in many aspects. Children with acute and chronic illnesses, who are hospitalized for a short or long time, have problems in their behaviors and performing daily life activities. These negativities vary by many factors, such as sociodemographic characteristics of the family and child and the types, severity, diagnosis, and treatment methods of the disease (4). Research on the quality of life among children emerged in the 1980s, and since then, many studies conducted to scrutinize the concept for sick children and their families (5,6) following the preliminary studies of Ditesheim and Templeton (7) and Henning et al. (8).

The previous research has suggested that the quality of life among sick children is affected by age (7), gender or disease status (6,9), the duration of diagnosis (10), the educational attainment of parents (11), maternal age, the number of siblings, the number of households, physical activity, the frequency of symptoms, the ability to take drugs, symptoms (9). In some studies, however, it has been found that the gender of the child and the educational attainment of the parents do not influence the quality of life among the children (6,12).

It has previously been reported that symptoms of the disease and side effects of chemotherapy and radiotherapy, such as pain, changes in taste, anorexia, alopecia, nausea, vomiting, feeling of fatigue, tachypnea, depression, and anxiety, adversely affect the quality of life (13). It has been revealed in some studies that children with cancer experience more impulsivity, mistrust, and anger than their healthy (14); fatigue has a critical determinant role in the quality of life (15); children with cancer have a high level of anxiety and depression (16); and stress, exhaustion, weakness, and demoralization are the most common problems, which adversely affects the quality of life (17).

Studies examining the quality of life of children with cancer appear to concentrate mostly on school-age (8-12) and adolescence (13-18) (18-22). Whereas studies examining the quality of life of children aged 2-7 years with cancer were found to be limited (17,23). As in other age groups, children with cancer in this age group are affected by the disease in many aspects. The disease, diagnosis, and treatment process may adversely affect the cognitive, language, social and emotional, physical, and fine and gross motor development of such children (24,25). It was reported that that the psychology and social development of children aged 2-5 may be adversely affected due to chronic diseases (26) and found that they had problems regarding procedural and treatment anxiety and communication. Prolonged and repeated hospitalization lead children to exhibit behaviors, such as finger sucking, enuresis (bedwetting), encopresis, sleep and eating disorders, and increased dependency, to experience depression, anxiety, introversion, decreased communication, aggressive behaviors, and anger attacks, and to face restricted physical movements, which, consequently, may cause adverse effects on their quality of life (24,27). Previous studies have shown that depressive symptoms, anger, inadequacy, insecurity, impulsivity, hopelessness and anxiety, and depression are experienced much more in children with cancer (14,28).

It is deemed to be quite essential and necessary to investigate the quality of life among children with cancer and to identify the influencing variables. It will be helpful for both children and their families to receive support services from health professionals, especially CDSs, to increase the quality of life of children. Accordingly, it was aimed to examine the quality of life among children with cancer by some variables, and ultimate objective of the present study was to shed light on the quality of life among children, to deliver programs and services for them, and to assert some recommendations to families and experts to boost their quality of life.

MATERIAL and METHOD

This is a descriptive study investigating whether the quality of life among hospitalized children aged 2-7 years with cancer differs by some of their characteristics.

While the mean scores of the mothers of children with cancer on the PedsQL constituted the dependent variable, independent variables of the study were age, gender, diagnosis, age of diagnosis, presence of alopecia, and meeting a CDS.

Sample of the Study

The sample of the present study was composed of the mothers of children hospitalized in pediatric oncology clinics of two university hospitals in Ankara, which provided relevant permits to conduct the study.

It was found that 34.3% of children were aged 73-84 months, 68.6% were aged 49-84 months. It was also determined that 51.4% of the children were girls, 54.3% were the last child of the family, 88.5% had 1-3 siblings, 85.7% did not attend any school, and 82.9% did not have any physical disabilities. The mean age of the children was 57.51±20.31 months. While 45.7% of the children were diagnosed with cancer at the age of 49-78 months, 57.1% were diagnosed with cancer other than leukemia and lymphoma (rhabdomyosarcoma, neuroblastoma, Wilms tumor, medulloblastoma, retinoblastoma, osteosarcoma, and Ewing Sarcoma), and 80% had alopecia. The mean age of the diagnosis was found to be 42.51±20.17 months.

It was determined that 42.9% of the mothers had no idea about CDSs, and 68.6% of them did not meet a CDS during their child's treatment. Mothers who met a CDS stated that they witnessed a CDS who came to the hospital to care with the children voluntarily, but there were no permanent CDS in the clinics where the children were hospitalized. Among 11 mothers who met a CDS during treatment, 9 were found to be received bedside care from the CDS for their child, and 3 of them received information and recommendations from the CDS about the development of their child.

Data Collection Tools

This research data were collected with a "Demographic Information Form" and the "Parent-Proxy Report of the Pediatric Quality of Life Inventory (PedsQL) 3.0 Cancer Module," which was developed by Varni et al. (29) and whose validity and reliability study was conducted by Yıldız Kabak et al. (23) for children aged 2-7 years. The scale aims at revealing the quality of life among children with cancer through parental evaluation of such children's experiences based on relevant items clustered under eight dimensions. The Demographic Information Form included a number of inquiries about age, gender, birth order, school attendance, number of siblings, diagnosis, age of the diagnosis, physical disabilities, presence of alopecia, and meeting any CDSs during the treatment. This module consists of 27 items within eight subscales: pain and hurt (two items), nausea (five items), procedural anxiety (three items), treatment anxiety (three items), worry (three items), cognitive problems (five items), perceived physical appearance (three items), and communication (three items). The parent filling out the form is asked to respond to the items by considering the last month of their child. The module is a 5-point Likert-type scale scored as never (100 points), rarely (75 points), sometimes (50 points), often (25 points), and almost always (0 points). A form is considered invalid if more than 50% of the items are left non-responded. The high scores on the scale indicate a high quality of life. It was determined that Cronbach's Alpha coefficients of the PedsQL 3.0 Cancer Module ranged from 0.803 to 0.873, just as the test-retest intra-class correlation coefficients ranged from 0.877 to 0.949 (23).

In this study, Cronbach's Alpha internal consistency coefficients were calculated as 0,818 for the Pain and Hurt subscale; 0,693 for the Nausea subscale; 0.720 for the Procedural Anxiety subscale; 0.849 for the Treatment Anxiety subscale; 0.824 for the Worry subscale; 0.341 for the Cognitive Problems subscale; 0.457 for the Perceived Physical Appearance subscale; and 0.763 for the Communication subscale. This value was found to be 0.806 for the total scale.

Data Collection Method

First off, six hospitals with child hematology-oncology clinics were identified in Ankara, and then the purpose and method of the research were explained to administrative staff through interviews. The relevant bodies of two university hospitals among these hospitals accepted the present study. Accordingly, the official permissions and approval required to conduct the present study were obtained from the two hospitals and the Ethics Committee (25.06.2018/151). The prospective mothers and children were met and explained the purpose and method of the research. The mothers who voluntarily accepted to participate in this research were asked to sign the Informed Consent Form. Then, the scale was administered to the participants by a single investigator (L.C.G), which lasted about 10-15 minutes. The data were collected between July 2018 and March 2019.

Ethical Considerations

A conditional use permit was obtained for the PedsQL 3.0 Cancer Module from V. Yıldız Kabak, who conducted the validity and reliability study of the Turkish version of the scale for children aged 2-7 years. Moreover, official permissions were obtained from the two university hospitals, where the research would be conducted, along with the ethical approval of the Ankara University Ethics Committee (25.06.2018/151). Finally, Informed consent was obtained from all the participating mothers.

Data Analysis

In the data analysis, continuous data were given as mean, standard deviation, median, and minimum-maximum, while categorical data were presented as percent values. The Shapiro-Wilk test was used to check the distribution of the data, and results revealed that the scores on the total scale showed a normal distribution ($p>0.05$). However, the scores on the subscales were found to show a non-normal distribution ($p<0.05$). The T-Test was used to compare normally distributed data with independent variables, while the Mann-Whitney U test and the Kruskal-Wallis H test were used to compare non-normally distributed data with independent variables. The significance level was taken as $p<0.05$ in all statistical analyses.

RESULTS

This section presents the descriptive results pertaining to the scores of the mothers on the PedsQL 3.0 Cancer Module and the findings inferred from the PedsQL 3.0 Cancer Module, where the mothers evaluated their child's quality of life.

Descriptive statistics regarding the quality of life by age are presented in Table 1. The mean scores of the children aged 24-48 months on the subscales of nausea and worry were significantly higher than those of children aged 49-84 months. Moreover, the level of cognitive problems was found to be significantly higher in children aged 49-84 months with cancer than those aged 24-48 months ($p<0.05$).

Considering the children's quality of life by gender, the mean scores of girls on the pain and hurt subscales were significantly higher than those of boys (Table 2) ($p<0.05$).

Descriptive statistics regarding the quality of life by the age of diagnosis are presented in Table 3. The mean scores of children diagnosed at the age of 49-78 months on the cognitive problems subscale were found to be significantly higher than those of cihldren diagnosed at the age of 0-24 ($p<0.05$).

In this study, the mean scores of the children on the subscales of pain and hurt [$U=139,500$], nausea [$U=121,000$], procedural anxiety [$U=94,000$], treatment anxiety [$U=134,500$], worry [$U=142,500$], cognitive problems [$U=117,500$], perceived physical appearance [$U=142,000$], and communication [$U=117,000$] and the total scale [$t(33)=1.366$] did not differ by their diagnosis ($p>0.05$).

The results revealed that the mean scores of the children on the subscales of pain and hurt [$U=80.000$], nausea [$U=97.500$], procedural anxiety [$U=88.500$], treatment anxiety [$U=81.500$], worry [$U=85.000$],

Table 1. Analysis results of life quality of children by age groups of children.

Subscales	Child's Age Group	n	Mean Rank	Total Rank	U	p
Pain and hurt	24-48 Months	11	17.91	197.00	131.000	0.986
	49-84 Months	24	18.04	433.00		
Nausea	24-48 Months	11	23.36	257.00	73.000	0.036
	49-84 Months	24	15.54	373.00		
Procedural anxiety	24-48 Months	11	17.86	196.50	130.500	0.958
	49-84 Months	24	18.06	433.50		
Treatment anxiety	24-48 Months	11	16.82	185.00	119.000	0.662
	49-84 Months	24	18.54	445.00		
Worry	24-48 Months	11	24.5	269.50	60.500	0.009
	49-84 Months	24	15.02	360.50		
Cognitive problems	24-48 Months	11	10.05	110.50	44.500	0.001
	49-84 Months	24	21.65	519.50		
Perceived physical appearance	24-48 Months	11	18.27	201.00	129.000	0.930
	49-84 Months	24	17.88	429.00		
Communication	24-48 Months	11	16.45	181.00	115.000	0.563
	49-84 Months	24	18.71	449.00		

		n	X̄	S	sd t	p
Total scale	24-48 Months	11	1731.81	233.48	33	
	49–84 Months	24	1626.04	496.59	0.669	0.508

Table 2. Analysis results of children's life quality according to gender of children.

Subscales	Gender of Child	n	Mean Rank	Total Rank	U	p
Pain and hurt	Girl	18	21.72	391.00	86.000	0.027
	Boy	17	14.06	239.00		
Nausea	Girl	18	19.72	355.00	122.000	0.318
	Boy	17	16.18	275.00		
Procedural anxiety	Girl	18	18.58	334.50	142.500	0.732
	Boy	17	17.38	295.50		
Treatment anxiety	Girl	18	18.86	339.50	137.500	0.613
	Boy	17	17.09	290.50		
Worry	Girl	18	17.81	320.50	149.500	0.909
	Boy	17	18.21	309.50		
Cognitive problems	Girl	18	18.44	332.00	145.000	0.807
	Boy	17	17.53	298.00		
Perceived physical appearance	Girl	18	17.36	312.50	141.500	0.708
	Boy	17	18.68	317.50		
Communication	Girl	18	18.53	333.50	143.500	0.757
	Boy	17	17.44	296.50		

		n	X̄	S	sd t	p
Total scale	Girl	18	1713.94	394.34	33	0.311
	Boy	17	1582.35	465.18	1.028	

cognitive problems [U=60.000], perceived physical problems [U=58.000], and communication [U=89.500] and the total scale [U=83.500] did not differ by the presence of alopecia (p>0.05).

Considering the children's quality of life by meeting a CDS (Table 4), The mean scores on the subscales of worry and perceived physical appearance differed significantly by meeting a CDS. Moreover,

Table 3. Kruskal Wallis H Test results according to age of diagnosis of children's life quality.

Subscales	Child's Age Group	n	Mean Rank	sd	χ^2	p
	0-24 Months	11	15.59			
Pain and hurt	25-48 Months	8	23.88	2	3.811	0.149
	49-78 Months	16	16.72			
	0-24 Months	11	21.05			
Nausea	25-48 Months	8	16.19	2	1.452	0.484
	49-78 Months	16	16.81			
	0-24 Months	11	16.86			
Procedural anxiety	25-48 Months	8	15.75	2	1.102	0.576
	49-78 Months	16	19.91			
	0-24 Months	11	15.82			
Treatment anxiety	25-48 Months	8	16.44	2	1.584	0.453
	49-78 Months	16	20.28			
	0-24 Months	11	22.50			
Worry	25-48 Months	8	16.69	2	4.226	0.121
	49-78 Months	16	15.56			
	0-24 Months^1	11	12.36			
Cognitive problems	25-48 Months^2	8	16.69	2	6.916	0.031
	49-78 Months^3	16	22.53			3>1
	0-24 Months	11	19.23			
Perceived physical appearance	25-48 Months	8	15.50	2	0.674	0.714
	49-78 Months	16	18.41			
	0-24 Months	11	18.27			
Communication	25-48 Months	8	21.56	2	1.938	0.380
	49-78 Months	16	16.03			
	0-24 Months	11	18.00			
Total scale	25-48 Months	8	17.56	2	0.022	0.989
	49-78 Months	16	18.22			

Table 4. Kruskal Wallis H Test results according to the children's quality of life by meeting a CDS.

Subscales	Child's Age Group	n	Mean Rank	sd	χ^2	p
	Yes	11	19.14			
	No	9	14.61			
Pain and hurt	No Idea	15	19.20	2	1.448	0.485
	Yes	11	17.64			
	No	9	19.94			
Nausea	No Idea	15	17.10	2	0.458	0.795
	Yes	11	19.32			
	No	9	19.22			
Procedural anxiety	No Idea	15	16.30	2	0.741	0.690
	Yes	11	16.59			
	No	9	23.78			
Treatment anxiety	No Idea	15	15.57	2	4.196	0.123
	Yes^1	11	16.50			
	No^2	9	24.50			
Worry	No Idea^3	15	15.20	2	6.661	0.036
	Yes	11	18.23			2>3
	No	9	13.61			
Cognitive problems	No Idea	15	20.47	2	2.652	0.266
	Yes^1	11	10.59			
	No^2	9	22.11			
Perceived physical appearance	No Idea^3	15	20.97	2	8.651	0.013
	Yes	11	15.73			2>1
	No	9	17.94			3>1
Communication	No Idea	15	19.70	2	1.181	0.554
	Yes	11	15.45			
	No	9	22.00			
Total scale	No Idea	15	17.47	2	2.096	0.351

children of the mothers who did not met a CDS were found to experience more worry than those of mothers did not have any idea about CDSs ($p<0.05$). Finally, on the perceived physical appearance subscale, children of the mothers who did not meet ($p=0.034$) and have any idea about CDSs ($p=0.03$) had higher mean scores than those of mothers who met a CDS, respectively.

DISCUSSION

Disease and treatment can affect the central nervous system of the child, which causes biological stress and adversely affects the childs development. The disease process may also intensify the child's emotions, such as anxiety (especially for bodily harm and loss of limbs), shame, and fear of loneliness, which can also cause worry and regression. The child may have difficulties in showing patience to the repeated, prolonged intervention and hospitalization process since the concept of time is not fully acquired in this period. Children in this age group experience anxiety and worry about bodily harm (24,27,30). The present results revealed that children aged 24-48 months experienced more problems with nausea and worry than children aged 49-84 months. Eiser et al. (31) found in their study that children having treatment for acute lymphoblastic leukemia had problems in and became worried about perceiving their physical appearance as they got older, but that younger children were less worried about perceiving their physical appearance. Previous studies indicate that younger children experience problems caused by diagnosis and treatment processes (pain and hurt, nausea, exhaustion, procedural anxiety, treatment anxiety, and communication) more than their older counterparts (17,18,32).

In this research, it was determined that children aged 49-84 months experienced more cognitive problems than children aged 24-48 months. Piaget's preoperational stage and Bruner's iconic stage include children aged 3-6 years; therefore, children in these stages convey the knowledge they acquire through words and concepts into their minds by formulating them into images. Children in this age period may not be able to clearly express their symptoms and develop the idea of "contamination" due to the disease. At the same time, the child may have difficulties in showing patience to the repeated, prolonged intervention and hospitalization process since the concept of time is not fully acquired in this period (24,27,30).

The nature of cancer, the diagnosis, and treatment procedures may increase pain over time, create biological and psychosocial stress, and adversely affect the development of hospitalized children. Pain control is an essential component in supporting the development of the hospitalized child (33). The present results suggested that girls had more problems with pain and hurt than boys. In some studies, it has been reported that girls' quality of life is significantly lower compared to boys, and they experience the disease more severely (34). Abu-Saad Huijer et al. (18) stated that the procedural anxiety of boys was significantly higher than that of girls, and gender did not make any difference in other subdimensions. In the studies of Jankowska Polanska et al. (17) and Kızmazoğlu et al. (12), the gender of children with cancer was concluded not to make any difference in their quality of life. At the same time, Jankowska Polanska et al. (17) mention that the issue of whether children's quality of life is affected by their gender is a topic of debate in the literature, and there are studies showing that the quality of life of older girls is lower than that of boys.

The present findings, there was a significant difference between the age of diagnosis and cognitive problems. The central nervous system of preschool (3-6 years) children with chronic disease may be affected due to the disease and treatment process, which causes biological stress and adversely affects the child's development. In general, the concept of the disease cannot be understood fully until about four years. Even if they cannot understand the process and mechanism of the disease, children up to 9 or 10 years may think that microbes need to enter the body to cause the disease. The child may have difficulties in showing patience to the repeated, prolonged intervention and hospitalization process since the concept of time is not fully acquired in this period (24,27,30). Children who are diagnosed at the age of 0-24 months may not be able to express adverse diagnosis and treatment experiences, and their mothers may not notice these problems. Whereas, children who are diagnosed at the age of 49-78 months can express their experiences related to the disease, hospitalization, and treatment better, which lead their mothers to recognize these problems more quickly. Children diagnosed in this period may have more difficulty in determining what to do in troubled situations, focusing their attention, and remembering what they read.

’Being diagnosed with cancer causes not only side effects, such as pain, fatigue, alopecia, nausea/vomiting, but also the appearance of symptoms, such as anxiety, depression, change in the concept of self, negative body image, pain, and fatigue (35). Alopecia is one of the undesired effects of chemotherapy and radiotherapy, and it is a condition that causes problems, such as anxiety, depression, negative body image, and low self-esteem in patients (36). Although the hair does not have a vital biological function in the human body, it plays an essential role in body image and self-definition in both men and women. Medical procedures applied during cancer treatment adversely affect the well-being of the patient, that is, the quality of life, and the symptoms cause threats to the psychological and physical integrity of the person (35,37). Adolescents regard their physical appearance much more than those in other age groups (24,27). Since the present study involved children aged 2-7 years, it was observed that hair and eyebrow loss due to alopecia did not affect their quality of life. Physical appearance may not cause anxiety and worry for preschool children.

CDS is a health professional who evaluates children throughout all developmental stages from birth to the end of adolescence, takes part in child health monitoring, and provides services to the child, its family, healthcare professionals, and society through development-related programs. In addition, although CDSs, who work to improve children’s quality of life, are categorized among “other” professionals by the Ministry of Health, they have a very critical place in the health-related system (38). It was found that the mean scores of the children on the subscales of worry and perceived physical appearance differed significantly by meeting a CDS. These results suggest that CDSs bear important roles and responsibilities for hospitalized children and their families. Akar Gençer and Yüksel (39) stated that the presence of a CDS in the hospital meant so much to families. The families in our country have previously stated that they need counseling-guidance services for their children’s development, education, nutrition, and behavioral and psychological problems and that the number of Child Development Polyclinics, where they can receive services both free of charge and easily, should be increased. They highlighted that the anxiety of children would decrease upon the informative and sensitive actions of healthcare professionals.

CDSs play an active role in eliminating the negative conditions in case children with cancer need developmental, psychological, and physical support due to their prolonged hospitalization and treatment processes. During the present study, the mothers reported that the presence of a healthcare professional, who would care about their children, play with them, follow their development, and offer the mothers, and support both them and their children, would be much appreciated, which suggest how essential role CDSs play in inpatient services. In addition, considering the daily life-restricting effects of inpatient treatment, CDSs need to take an active role, especially in pediatric hematology-oncology services, to minimize such impacts on sick children and their families. It is believed that CDSs bear a critical mission in order to ensure children with cancer and their families, who have many psychological, developmental, and physical disadvantages, to overcome disease and treatment processes.

Study Limitations

This present study is limited to the mothers of children between the ages of 2 and 7 years of age who were hospitalized at the children’s oncology clinic of two university hospitals, who were diagnosed with cancer at least six months ago, receiving active chemotherapy treatment and who did not have major physical and motor development disorders and July 2018 and March 2019. Since the scale used in this study was a cancer module, comparing children receiving cancer treatment with their healthy peers was not applicable.

Clinical Implications

It is well established that chronic illness places quality of life at risk and is usually detrimental to it. Chronic illnesses often trigger invasive or uncomfortable treatment protocols. Cancer disease, which is a chronic disease, also appears as a disease that negatively affects the quality of life. It is known that quality of life is affected by the disease status especially in young children. In the light of all this information, the research was carried out to determine the factors affecting the quality of life of children with cancer, and to make suggestions to improve the quality of life of children.

CONCLUSIONS

As a result of the present study, in which the quality of life of children with cancer was examined according to the opinions of their mothers, it was concluded that children aged 24-48 months experienced nausea and worry more while those aged 49-84 months experienced cognitive problems more; girls had a higher perception of pain and hurt; children diagnosed at the age of 49-78 months experienced cognitive problems more; and children of the mothers who did not have any idea about CDSs had more problems with worry while children of the mothers who did not meet and have any idea about CDSs had more problems with perceived physical appearance ($p<0.05$).

In light of these findings, the following recommendations can be offered to families, specialists, and researchers:

- Since cancer children may experience changes and problems with pain-hurt, nausea, procedural anxiety, treatment anxiety, worry, physical appearance, communication, and cognition in the diagnosis-treatment process, further actions need to focus on increasing the quality of life by identifying their problems and relevant solutions to them based on their ages, developmental characteristics, and ages of the diagnosis.
- Considering the importance of the role and functions of child development specialists in hospitals, children with cancer and their parents, who are required to engage in long-term treatment processes and repeated hospitalizations, can be provided more active support from child developers.
- The number of child developers working in hospitals can be increased, and support services for children and families can be improved.
- In this study, the quality of life of children with cancer aged 2-7 years was evaluated by their mothers' opinions. The subject can be investigated according to paternal opinions, and opinions from mothers and fathers can be compared in terms of their children's quality of life.
- Studies may be conducted to compare the quality of life of children with cancer and their healthy peers.

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REFERENCES

1. Rahman T, Mittelhammer RC, Wandschneider PR. Measuring quality of life across countries: A multiple indicators and multiple causes approach. The Journal of Socio-Economics. 2011;40:43-52. https://doi.org/10.1016/j.socec.2010.06.002
2. Eser E, Yüksel H, Baydur H, Erhart M, Saatli G, Cengiz Özyurt B et al. Çocuklar İçin Genel Amaçlı Sağlıkla İlgili Yaşam Kalitesi Ölçeği (Kid-KINDL) Türkçe sürümünün psikometrik özellikleri. Türk Psikiyatri Dergisi. 2008;19:409-17.
3. Kutlu R, Çivi S, Börüban MC, Demir A. Kanserli hastalarda depresyon ve yasam kalitesini etkileyen faktörler. Selçuk Üniv Tıp Derg. 2011;27:149-53.
4. Yıldız Akkuş S, Bütün Ayhan A. Kronik hastalığı olan çocukların davranışlarının ve yaşam kalitelerinin incelenmesi. Türkiye Çocuk Hastalıkları Dergisi. 2018;14:129-35.
5. Durualp E, Kara FN, Yılmaz V, Alabeyoğlu K. Kronik hastalığı olan ve olmayan çocukların ve ebeveynlerinin görüşlerine göre yaşam kalitelerinin karşılaştırılması. Ankara Üniversitesi Tıp Fakültesi Mecmuası. 2010;63:55-63. https://doi.org/10.1501/Tipfak_0000000761
6. Gånemo A, Svensson Å, Lindberg M, Wahlgren C-F. Quality of life in Swedish children with eczema. Acta Derm Venereol. 2007;87:345-9. https://doi.org/10.2340/00015555-0245

7. Ditesheim JA, Templeton Jr JM. Short-term v long-term quality of life in children following repair of high imperforate anus. J Pediatr Surg. 1987;22:581-7.
https://doi.org/10.1016/S0022-3468(87)80103-3
8. Henning P, Tomlinson L, Rigden S, Haycock G, Chantler C. Long term outcome of treatment of end stage renal failure. Arch Dis Child. 1988;63:35-40.
https://doi.org/10.1136/adc.63.1.35
9. Sertçelik T, Alkan F, Yalın Sapmaz Ş, Coşkun Ş, Eser E. Doğuştan kalp hastalığı olan çocuklarda yaşam kalitesi. Türk Pediatri Arşivi. 2018;53:78-86.
10. Peeters J, Meitert J, Paulides M, Wiener A, Beck J, Calaminus G et al. Health-related quality of life (HRQL) in ALL-patients treated with chemotherapy only-A report from the late effects surveillance system in Germany. Klin Padiatr. 2009;221:156-61.
https://doi.org/10.1055/s-0029-1216366
11. Küpeli B, Küpeli S. Çocukluk çağı kanserleri ve yaşam kalitesi. Arşiv Kaynak Tarama Dergisi. 2015;24:368-89.
https://doi.org/10.17827/aktd.44778
12. Kızmazoğlu D, Sarı S, Evim Sezgin M, Kantarcıoğlu A, Tüfekçi Ö, Demir Yenigürbüz F et al. Assessment of health-related quality of life in pediatric acute lymphoblastic leukemia survivors: Perceptions of children, siblings, and parents. Turkish Journal of Hematology. 2019;36:112-6.
https://doi.org/10.4274/tjh.galenos.2018.2018.0351
13. Usta Yeşilbalkan Ö, Durmaz Akyol A, Çetinkaya Y, Altın T, Deniz Ü. Kemoterapi tedavisi alan hastaların tedaviye bağlı yaşadıkları semptomlar ve yaşam kalitesine olan etkisinin incelenmesi. Ege Üniversitesi Hemşirelik Fakültesi Dergisi. 2005;21:13-31.
14. Durualp E, Altay N. A comparison of emotional indicators and depressive symptom levels of school-age children with and without cancer. J Pediatr Oncol Nurs. 2012;29:232-9.
shttps://doi.org/10.1177/1043454212446616
15. Pan HT, Wu LM, Wen SH. Quality of life and its predictors among children and adolescents with cancer. Cancer Nurs. 2017;40:343-51.
https://doi.org/10.1097/NCC.0000000000000433
16. Götze H, Ernst J, Brähler E, Romer G, Von Klitzing K. Predictors of quality of life of cancer patients, their children, and partners. Psycho-Oncology. 2015;24:787-95.
https://doi.org/10.1002/pon.3725
17. Jankowska-Polańska B, Sliwiński M, Świątoniowska N, Butrym A, Mazur G. Quality of life in children with acute lymphoblastic leukaemia. Scand J Caring Sci. 2019;34:380-9.
https://doi.org/10.1111/scs.12739
18. Huijer Ha-S, Sagherian K, Tamim H. Quality of life and symptom prevalence as reported by children with cancer in Lebanon. Eur J Oncol Nurs. 2013;17:704-10.
https://doi.org/10.1016/j.ejon.2013.09.004
19. Friedrichsdorf SJ, Postier A, Dreyfus J, Osenga K, Sencer S, Wolfe J. Improved quality of life at end of life related to home-based palliative care in children with cancer. J Palliat Med. 2015;18:143-50.
https://doi.org/10.1089/jpm.2014.0285
20. Ho L, Li W, Cheung AT, Ho E, Lam K, Chiu SY et al. Relationships among hope, psychological well-being and health-related quality of life in childhood cancer survivors. J Health Psychol. 2019:1359105319882742.
https://doi.org/10.1177/1359105319882742
21. Kowaluk A, Woźniewski M, Malicka I. Physical activity and quality of life of healthy children and patients with hematological cancers. Int J Environ Res Public Health. 2019;16:2776.
https://doi.org/10.3390/ijerph16152776
22. Xia W, Li HCW, Lam KWK, Chung OKJ, Song P, Chiu SY et al. The impact of hematologic cancer and its treatment on physical activity level and quality of life among children in mainland China: a descriptive study. Cancer Nurs. 2019;42:492-500.
https://doi.org/10.1097/NCC.0000000000000661
23. Kabak VY, Yakut Y, Çetin M, Düger T. Reliability and validity of the Turkish version of the PedsQL 3.0 cancer module for 2-to 7-year-old and the PedsQL 4.0 generic core scales for 5-to 7-year-old: The Hacettepe University Experience. Turkish Journal of Hematology. 2016;33:236-43.
https://doi.org/10.4274/tjh.2015.0242
24. Beyazıt U, Bütün Ayhan A. Hasta çocukların ruhsal özellikleri ve hasta çocuğa yaklaşım. Hasta Çocukların Gelişimi ve Eğitimi (Ed: A Bütün Ayhan) Eskişehir: Anadolu Üniversitesi Yayınları. 2015.
25. Sezgin S, Ekinci M, Okanli A. Kanserli çocukların yaşadıkları psikososyal problemler ve hemşirelik yaklaşımları. Journal of Experimental and Clinical Medicine. 2007;24:107-12.
26. Reinfjell T, Lofstad GE, Veenstra M, Vikan A, Diseth TH. Health-related quality of life and intellectual functioning in children in remission from acute lymphoblastic leukaemia. Acta Paediatr. 2007;96:1280-5.
https://doi.org/10.1111/j.1651-2227.2007.00383.x
27. Karaaslan T, Beyazıt U, Bütün Ayhan A. Gelişimsel dönemler açısından hasta çocuklar ve hastane ortamının düzenlenmesi. Hasta Çocukların Gelişimi ve Eğitimi (Ed: A Bütün Ayhan) Eskişehir: Anadolu Üniversitesi Yayınları. 2015.
28. Giannakopoulos G, Kazantzi M, Dimitrakaki C, Tsiantis J, Kolaitis G, Tountas Y. Screening for children's depression symptoms in Greece: the use of the Children's Depression Inventory in a nation-wide school-based sample. Eur Child Adolesc Psychiatry. 2009;18:485-92.
https://doi.org/10.1007/s00787-009-0005-z
29. Varni JW, Seid M, Rode CA. The PedsQL™: measurement model for the pediatric quality of life inventory. Med Care. 1999:37;126-39.
https://doi.org/10.1097/00005650-199902000-00003
30. Atay G, Eras Z, Ertem İ. Çocuk hastaların hastane yatışları sırasında gelişimlerinin desteklenmesi. Çocuk Dergisi. 2011;11:1-4.
31. Eiser C, Stride C, Vora A, Goulden N, Mitchell C, Buck G et al. Prospective evaluation of quality of life in children treated in UKALL 2003 for acute lymphoblastic leukaemia: A cohort study. Pediatr Blood Cancer. 2017;64:e26615.
https://doi.org/10.1002/pbc.26615
32. Dupuis LL, Lu X, Mitchell HR, Sung L, Devidas M, Mattano Jr LA et al. Anxiety, pain, and nausea during the treatment of standard-risk childhood acute lymphoblastic leukemia: A prospective, longitudinal study from the Children's Oncology Group. Cancer. 2016;122:1116-25.
https://doi.org/10.1002/cncr.29876
33. Hockenberry MJ, Mccarthy K, Taylor O, Scarberry M, Franklin Q, Louis CU et al. Managing painful procedures in children with cancer. J Pediatr Hematol Oncol. 2011;33:119-27.
https://doi.org/10.1097/MPH.0b013e3181f46a65
34. Tha'er GM, Mandrell BN, Gattuso JS, West NK, Taylor SL, Hinds PS. Children's perspective on health-related quality of life during active treatment for acute lymphoblastic leukemia: an advanced content analysis approach. Cancer Nurs. 2015;38:49-58.
https://doi.org/10.1097/NCC.0000000000000174
35. Pehlivan S, Doğan D, Kahraman BN, Özkalemkaş F. Akut lösemi hastalarında alopesinin beden imajı ve benlik saygısına etkisi. Uludağ Üniversitesi Tıp Fakültesi Dergisi. 2019;45:173-8.
36. Ateş S, Olgun N. Kemoterapiye bağlı alopesi ve yaşam kalitesi. Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi. 2014;1:67-80.
37. Weber C, Fliege H, Arck P, Kreuzer KA, Rose M, Klapp B. Patients with haematological malignancies show a restricted body image focusing on function and emotion. European journal of cancer care. 2005;14:155-65.
https://doi.org/10.1111/j.1365-2354.2005.00533.x
38. Taştepe T, Akyol AK. Hastanelerde görev yapan çocuk gelişimcilerin çalışma ortamları ile mesleklerine ilişkin görüşlerinin incelenmesi. Ankara Sağlık Bilimleri Dergisi. 2014;3:29-54.
https://doi.org/10.1501/Asbd_0000000045
39. Akar Gençer A, Yüksel N. Sağlık personelinin hastanede görev yapan çocuk gelişimcilere yönelik görüşlerinin incelenmesi. Uluslararası Sosyal Araştırmalar Dergisi. 2016;9:2530-7.
https://doi.org/10.17719/jisr.20164317812