

Factors Affecting Sleep in Hospitalised Children and Adolescents with Cancer

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ABSTRACT

Objective: Children and adolescents with cancer may have sleep problems. There are environmental and patient/disease-related factors affecting the sleep of a child with cancer. This study evaluates the factors affecting the sleep of children and adolescents with cancer.

Method: The study was conducted as a descriptive study to determine the factors affecting sleep problems in children and adolescents with cancer. The data was collected using a survey of children and adolescents with cancer and their mothers. The researchers developed the two-part Factors Affecting the Sleep of children and adolescents with Cancer Survey. The sample included 75 children and adolescents with cancer.

Results: Sixty-eight percent of the children stated that sleep was "bad" and six percent as "very bad" in the hospital, whereas 86% of the mothers said that their sleep was "bad/very bad" in the hospital. Hospital environments such as crowded rooms, frequent visits of the nurses for treatment at night, noise and light in the room, and odours in the room were the most reported environmental factors associated with sleep problems in children. Excessive urination, nausea, vomiting, pain, and nightmares were the most reported symptoms disturbing the sleep of the children.

Conclusion: The hospital environment, including noise, light levels, and room interruptions, may disrupt sleep. Nurses and doctors should regularly assess sleep in all children hospitalised in the paediatric oncology ward. The patient's chemotherapy and fluid therapy should be planned according to sleep patterns. Nurses may be able to control some factors that affect sleep duration in hospitalised paediatric patients with cancer.

Keywords: Cancer, children, adolescent, hospital, sleep, nurse

INTRODUCTION

Both children and their caregivers have severe problems due to the diagnosis and treatment of cancer. Although the survival of children and adolescents with cancer has increased significantly in developing countries, the quality of life has become an important issue (1,2). There are many factors that influence the quality of life. One of these factors is that sleep problems affect the quality of life of children and their caregivers (3,4).

The prevalence of sleep problems in children and adolescents in the general population is reported to be up to 30% (5-11). The exact prevalence of sleep problems in children with cancer is unknown (5-8). Sleep problems were defined as "feeling

disturbed due to disturbance of sleep time or negatively affecting the way of life." It was determined that children with cancer had sleep problems such as difficulty falling asleep, sleepiness, and frequent waking (4,9-11).

Sleep problems affect the child's bio-psycho-social health, disease, and treatment process, and activities of daily life (12-14). Difficulties in adapting to the disease and treatment, neurocognitive dysfunction and learning disabilities, depression, anxiety, and behaviour problems in children with cancer who have sleep problems were found to be high (10,14). Persistent sleep problems can impair cognitive development, influence emotional regulation, and intensify behavioural issues, making

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adherence to treatment protocols more difficult for children and their caregivers. Furthermore, poor sleep may reduce a child's resilience, causing a decline in mental health outcomes such as increased risk of depression and heightened anxiety.

There are many environmental and institutional factors affecting the sleep of a child with cancer and causing deterioration in sleep patterns (15-21). These factors include environmental and institutional factors (such as noise, light, excess of room temperature irregularity, and unknown environment) (15,16), patient and disease factors (such as anxiety, stress, depression, side effects of chemotherapy and other drugs) (15,17), and symptoms (such as fatigue, pain, vomiting) (16-21). Beyond these, familial stress and frequent interruptions for medical assessments and treatments throughout the night can also contribute to disrupted sleep. Nurses and healthcare providers frequently encounter challenges in balancing necessary medical interventions with maintaining a restful environment for the child, emphasising the importance of targeted interventions to support sleep in paediatric oncology settings.

The deterioration of sleep habits in children with cancer is an essential and priority problem because sleep is one of the basic life requirements of the individual. Health workers should understand the importance of sleep in terms of the growth and physical-psychological-social health of the child. They are essential in detecting sleep disturbances in children with cancer and educating the family and child about healthy sleep habits (12). Supporting healthy sleep practises can significantly enhance the quality of life for both children and their caregivers, potentially improving treatment adherence and outcomes. Health workers, especially nurses, should be alert to these potential problems while assessing and caring for patients. This study aimed to identify the factors affecting sleep in hospitalised children and adolescents with cancer.

Research questions;

- Does the diagnosis of cancer affect the sleep of children and adolescents?
- What are the factors that affect the sleep of children and adolescents with cancer?

MATERIAL AND METHODS

Settings

The aim of this study was to evaluate the factors affecting the sleep of children and adolescents with cancer. The study was conducted in the Istanbul University Oncology Institute paediatric haematology-oncology unit. Two or three patients and their mothers shared most rooms, which had a common bathroom. Only women were accepted as caregivers in the ward. In this study, all caregivers were the children's mothers.

Sample

Children were eligible to participate if (1) they were between 7 and 18 years of age, (2) they had been diagnosed with cancer,

(3) they were hospitalised in the oncology unit for at least one week, (4) both parent and child were willing to participate in the study.

Data Collection

We developed a survey that consisted of two parts. In the first part, there were questions regarding the sociodemographic characteristics of the mother and child, such as age, gender, diagnoses of the child, and age, education level, and occupation of the mother. The second part consisted of questions regarding factors that affect the sleep quality of children in the hospital. Sleep quality was graded as good, bad, and very bad. **"Very bad sleep"** is defined as waking up more than 3 times during the night, not being able to fall asleep more than 60 minutes after waking up at night, and less than 5 hours of sleep in the preceding 24 hours. **"Bad sleep"** is defined as waking up 1-3 times during the night, not being able to fall asleep more than 30 minutes after waking up at night, 5-6 hours of sleep in the preceding 24 hours. **"Good sleep"** is defined as falling asleep quickly, not waking up at night, and having at least 8 hours of sleep in the preceding 24 h. The grade of sleep and the factors that affected sleep quality were determined from various studies (6,15,17,19) in the literature (Table 3). The feedback and opinions of 5 experts (paediatric oncologists, nurses with more than 15 years of experience in paediatric oncology, and patient advocates) were obtained for the survey. A simple grading system was generated after the discussions.

Table 1. Descriptive characteristics (N=75)

Age	n	%
7-12	48	64.0
13-18	27	36.0
Gender		
Girl	33	44.0
Boy	42	56.0
Diagnosis		
ALL	11	14.7
Hodgkin lymphoma	8	10.7
Sarcoma	21	28.0
Brain tumours	11	14.7
Germ cell tumours	8	10.7
Others	16	21.3
Mother's Education		
Only literate	2	2.7
Primary education	47	62.7
High school	17	22.7
University	9	12.0
Mother's Age		
28-36	27	36.0
37-45	38	50.7
46-54	10	13.3
Mother's Occupation		
Housewife	57	76.0
Employed	18	24.0
Total	75	100.0

All data were collected from children and adolescents. The clinical nurse asked the child to fill out the questionnaire. The nurse provided the necessary explanations for the questions when they were asked.

Statistical Analyses

All data analyses were conducted using the Statistical Package for IBM SPSS Statistics 22 (SPSS IBM, Turkey). The means and 95% confidence intervals (CI) were calculated for descriptive data analysis.

Ethics

The study was approved by Koç University's Ethics Review Board (2017.028.IRB3.015). Additionally, institutional permission from İstanbul University Oncology Institute was obtained before the study.

RESULTS

Sample Characteristics

The sociodemographic characteristics of the participants are presented in Table 1. The study included 75 children and adolescents with cancer. Sixty-four percent of the participants were school-age children (7-12), and 36% were adolescents (13-18). The male-female ratio was 1.2:1. The diagnoses of the patients were sarcomas (n=21; 28.0%), brain tumours (n=11; 14.7%), leukaemia (n=11; 14.7%), lymphoma (n=8; 10.7%), germ cell tumour (n=8; 10.7%), and other (n = 16; 21.3%). Half of the mothers were approximately 37-45 ages. Most (62.7%) had graduated from primary school, and most were housewives (76%).

All the children and adolescents stated that their sleep at home was good, but only 24% had good sleep at the hospital. Sixty-eight percent of the children indicated that sleep was bad in the hospital.

The most common environmental and institutional factors affecting sleep were the feeling of lack of fresh air in the room (94.7%), the frequent entering and leaving of the room (92.0%), many patients in the room (90.7%), and the odours in the environment (88.0%). The most common factors that were related to patient and disease included medical devices (81.3%), homesickness (76.0%), medication used (74.7%), and not feeling confident and safe (72.0%). Symptoms affecting the sleep patterns of children were excessive urination at night (82.7%), nausea and vomiting (76.0%), pain (68.0%), nightmares (58.7%), and sweating (45.3%).

Table 2. Sleep of children (N=75)

	Good		Bad		Atrocious	
	n	%	n	%	n	%
Children's sleep						
At home	75	100.0	-	-	-	-
At hospital	18	24.0	51	68.0	6	8.0

DISCUSSION

Sleep is one of the basic requirements for the quality of life of all children. Cancer and its treatments cause sleep disturbance in children (4,8,19). In this study, all the children reported good sleep at home but had sleep disturbances in the hospital environment. The children and adolescents stated that the crowd in the room, odours (some foods or sweat), noise, and light affected their sleep. Hospitalisation disturbs sleep, even in developed countries where, most of the time, each patient has a private room.

In most developing countries, patients and caregivers must share the same room/ward due to the high number of patients and inadequate infrastructure. In this study, four to six people, including mothers, shared the same room.

This study grouped the factors affecting children's sleep under three headings: 1) environmental and institutional, 2) patient and disease, and 3) symptoms.

Environmental and institutional factors:

These findings show the importance of the physical environment in the paediatric oncology ward. The physical environment, such as sound, noise, and light, in the hospital is important (14, 19). Although each room had air conditioning, most mothers would not allow it to be used due to the misperception that their children may feel cold; this misperception is common in the community (20-22).

The children also stated that the hospital's sleep and wake-up hours differed from their routines. Similarly, the unknown environment, differences in sleep routines, and lack of private rooms negatively affect the sleep process and quality in the literature (23-25).

Factors related to patient and disease

Patient- and disease-related factors also affect the child's sleep. This study determined frequent nurse visits for intravenous (IV) treatment and assessed the vital signs that disturbed the children's sleep. In addition, factors such as the patient's homesickness, feeling unsafe in the hospital, and failure to provide adequate information about the interventions and disease have negatively affected the child's sleep. It has been reported that frequent visits by the nurse woke children up at night (9,15, 26-28).

Table 3. Factors affecting the sleep in the hospital

Factors	Yes		No	
	n	%	n	%
Environmental and Institutional Factors				
The feeling of lack of fresh air in the room	71	94.7	4	5.3
Frequent entry and exit in the room	69	92.0	6	8.0
Too many patients in the room	68	90.7	7	9.3
Odours in the ward	66	88.0	9	12
Noise around	64	85.3	11	14.7
Frequent entrance to the room	63	84.0	12	16
Hospital sleep and waking hours	61	81.3	14	18.7
Change of the environment	57	76.0	18	24
Intervention and treatments during the sleep time	56	74.7	19	25.3
Patient and Disease Factors				
Medical devices (serum, medication, etc.)	61	81.3	14	18.7
Homesickness	57	76.0	18	24.0
Medication used	56	74.7	19	25.3
Not Feeling confident and secure	54	72.0	21	28.0
Inability to apply pre-sleep habits	41	54.7	34	45.3
Failure to provide adequate information about the interventions and disease	29	38.7	46	61.3
Having concerns about the disease	24	32.0	51	68.0
No daytime activities and daytime constant sleep	26	34.7	49	65.3
Symptoms				
Excessive urination	62	82.7	13	17.3
Nausea and vomiting	57	76.0	18	24.0
Pain	51	68.0	24	32.0
Nightmares	44	58.7	31	41.3
Sweating	34	45.3	41	54.7
Diarrhoea	21	28.0	54	72.0
Constipation	25	33.3	50	66.7
Hunger/thirst	18	24.0	57	76.0

Symptoms

In this study, the children stated that excessive urination was most affected by their sleep. The child may need to go to the bathroom frequently because of the abundant hydration and the medications he/she takes, which negatively affects the child's sleep.

More than half of the children reported that their sleep was affected by nausea, vomiting, and pain. The symptoms of pain, nausea, vomiting, and fatigue were found to affect sleep in previous studies (2,29-31). Nearly half of the children stated that their sleep was affected by night nightmares in this study. Nightmares, mostly due to anxiety caused by illness and treatment, have been reported in children with cancer (4,14,30).

CONCLUSION

In this study, the sleep of children and adolescents with cancer has changed by hospitalisation. The hospital environment, including noise and light levels and room interruptions, disrupted sleep. Practical solutions have been postulated regarding the results of the study. We planned to provide each patient and mother with free eye bands to decrease light exposure at night. We have renovated the rooms with

donations and increased the number of bathrooms, and we provide hot water 24 hours a day so that they can shower when they want. The light system has been changed to provide soft lights for the nights. It was built a new common kitchen, albeit small, with more refrigerators where families could store the foods that they brought for their children. This has decreased the odours of food in the rooms. It was bought a new air conditioner to help reduce the odours and educated the mothers on using air conditioners. However there were not private one-bedrooms since the area is limited, and it was not reduced the number of beds since we have a lot of patients in Istanbul and most hospital beds in all hospitals are full. Some arrangements have been made, such as changing the processes to accommodate earlier chemotherapy administration times and reducing the amount of IV hydration at night.

In summary, hospitalisation causes sleep disturbances in children with cancer. Assessing the contributing factors in the local centres, especially in low-resource settings, may help to find some practical solutions.

The limitation of the study is that it is only based on self-reported data. The study was conducted in only one institution. A larger sample size could be used.

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