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Evaluation of sleep health of hospitalized children: A qualitative research from the perspective of children

Hastanede yatan çocukların uyku sağlığının değerlendirilmesi: Çocukların bakış açısından nitel bir araştırma

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Abstract

Aim: This study was conducted to determine sleep health of hospitalised children and the factors affecting sleep health.

Material and Methods: This study was conducted with a qualitative descriptive design. It was carried out with 30 children aged between 9-15 years who were treated in the paediatric ward. The data were collected by one-on-one in-depth interview technique.

Results: The study also found that the children experienced sleep problems. It has been found that environmental and emotional factors, as well as clinical routines and disease symptoms, have a significant impact on sleep efficiency. Furthermore, it has been observed that symptoms improve in some children, their sleep duration increases.

Conclusion: The study results revealed that children experienced sleep problems during their hospital stay and were significantly affected by environmental and psychosocial factors related the hospital environment.

Keywords: Child; Hospital; Sleep; Sleep problems.

Öz

Amaç: Bu çalışma, hastanede yatan çocukların uyku sağlığını ve uyku sağlığını etkileyen faktörleri belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Bu çalışma, nitel tanımlayıcı bir tasarımla gerçekleştirilmiştir. Çalışma, çocuk servisinde tedavi gören 9-15 yaş arası 30 çocukla yapılmıştır. Veriler, bire bir derinlemesine görüşme tekniği ile toplanmıştır.

Bulgular: Çalışmada çocukların uyku sorunları yaşadığını bulunmuştur. Çevresel ve duygusal faktörlerin, klinik rutinleri, hastalık semptomlarının uyku verimliliğini önemli ölçüde etkilediği bulunmuştur. Ayrıca, bazı çocukların semptomları azaldıkça uyku sürelerinde artış olduğu gözlemlenmiştir.

Sonuç: Çalışma sonuçları, çocukların hastanede kaldıkları süre boyunca uyku sorunu yaşadıklarını, hastane ortamına bağlı çevresel ve psikososyal etkenlerden önemli ölçüde etkilendiklerini ortaya koymuştur.

Anahtar Kelimeler: Çocuk; Hastane; Uyku; Uyku sorunları.

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Introduction

For children, illness is a frightening and disturbing situation. Some children may spend the illness process in the hospital. The fact that the hospital is an unfamiliar environment, healthcare professionals, interventions, care and treatments may bring along various physical and psychological health problems in children.[1] Interventions, separation from family members, loss of control, bodily injury and pain cause the child to experience negative emotions such as fear and anxiety.[2-4] Behavioural changes such as depression, aggression, regression, not eating and not sleeping may be observed in children during hospitalisation.[1-3] One of the most important effects of illness and hospitalisation in children is sleep disorder and sleep problems because it is stated that hospitalised children face the risk of impaired and poor quality sleep.[4-7]

Children need healthy sleep for the support of their growth and development.[8,9] Sleep health has been defined as "a multidimensional sleep-wake pattern that is adapted to individual, social and environmental demands and that promotes physical and mental well-being".[10] Good sleep health is characterised by subjective satisfaction, appropriate timing, adequate duration, high efficiency, regularity and continuous wakefulness behaviour during waking hours.[11,12] Regular and sufficient sleep is essential for children's physical and psychological health.[13-15] It has been reported that inadequate sleep in children is associated with negative physical, cognitive and psychological health indicators.[9,16-18] Inadequate sleep suppresses the immune system, increases pain perception, and negatively affects the regulation of blood glucose and neuroendocrine functions.[15,19-21] During hospitalisation, sleep patterns must be maintained in order to preserve recovery and the immune system.[22,23] It is stated that disturbed sleep may continue after discharge and may negatively affect recovery in the short term and healthy functioning in the long term.[24,25] Although sleep is important during the illness process, hospitals have a poor sleep environment.[23,26,27]

Studies have shown that hospitalised children have shorter sleep durations and experience poor sleep quality.[21-23] In a retrospective study, sleep abnormalities were found in 89% of hospitalised children.[28] Studies indicate that there are environmental factors that negatively affect sleep patterns in the hospital environment.[21,27,29] The complex environment of the hospital, the interventions conducted on the child, the care and treatment of the child are among the factors that affect sleep states.[22,27] It is stated that the most important factor affecting sleep patterns in hospitalised children is noise.[21] It has been found that the environmental characteristics of the clinics where paediatric and adult individuals are cared for do not comply with WHO (World Health Organization) standards in terms of sleep.[30,31] WHO states that the noise level in hospital wards should be 30-45 dB.[32] However, studies indicate that noise levels are higher than 45 dB in the majority of adult and paediatric wards.[21,26,31] In an observational study conducted in a paediatric oncology clinic, Linder and Christian reported sudden sound increases and sound amplification during the night.[26] Sleep problems of children treated in paediatric clinics continue; however, the number of studies examining sleep processes and factors affecting these is insufficient.[9,23] Although factors affecting sleep have been identified as potentially related to disease symptoms and hospital conditions, definitive conclusions remain unreached.[33] Determining the sleep status and influencing factors in children during hospitalization is crucial for mitigating the negative consequences of poor sleep quality.[34] A review of the literature reveals that while quantitative research methods investigate the problems of children hospitalized, some qualitative studies focus on results concerning parents and healthcare professionals. However, children's experiences regarding sleep in the hospital have not been investigated. This may lead to a lack of knowledge about children's sleep experiences and the problems they encounter. Examining children's sleep health during hospitalization from the child's perspective is important for identifying and increasing the visibility of existing problems from a broader perspective. Therefore, this research was conducted to deeply examine the sleep health of children

hospitalized and the factors affecting it from the children's perspective. Determining children's experiences and perspectives on problems can provide guidance on preventative measures that can be taken during children's hospitalizations. This research aims to answer the following questions and develop recommendations for preventative measures.

- How does the hospital environment affect children's sleep?
- What factors affect the sleep patterns of children hospitalized?
- How do the sleep patterns of hospitalized children affect their illness symptoms?
- What do hospitalized children suggest to improve their sleep?

Material and Method

Design and sampling of the study

This study was conducted with a qualitative descriptive design.[35] Qualitative descriptive research is a research method that enables individuals to reveal their thoughts, perspectives and perceptions about events in a realistic and holistic way through methods such as observation and interviews.[36] Therefore, a qualitative descriptive research method was chosen to determine the sleep health of children hospitalized and the factors affecting their sleep health.

Research population and sample

Sample of the study consisted of children aged between 9 and 15 years who were being treated in the paediatric departments of a hospital located in the east of Turkey. According to Piaget's Cognitive Development Theory, the abstract operational stage (9-18 years) is a period when children can think about events/situations, interpret events, and express their feelings and thoughts in an original way. Therefore, only children in a specific age group were included in the research.[37] After interviewing 20 of the children, it was determined that the data was duplicated. Several more interviews were conducted, but no different or new data was obtained, and it was perceived that data saturation had been achieved.[38,39] Since data saturation was reached, the study was completed with 30 children.

Inclusion criteria for the study: Children aged 9-15 years who were hospitalized with no physical or mental health issues that would prevent them from expressing themselves, and those who both themselves and also their parents agreed to participate in the study were included.

Exclusion criteria for the study included: hearing and speech impairments diagnosed by a doctor; psychological problems such as anxiety disorder, depression, post-traumatic stress disorder, obsessive-compulsive disorder; and mental health issues such as Down syndrome, autism spectrum disorder, intellectual disability, attention deficit hyperactivity disorder, and conduct disorder.

Data collection tools

The data were collected in August-September 2022 by using one-on-one in-depth interview technique. All researchers have experience conducting one-on-one in-depth interviews and have conducted research that includes qualitative interview reports. Data was collected by the first researcher. Children and their parents were informed about the research and an appointment date was set. Interviews were conducted when the children were not undergoing treatment or routine tasks, when they wanted to talk, and when they were with their parents. Each child was interviewed once, and each interview lasted approximately 40-50 minutes. During the one-on-one interviews, supportive language was used to ensure the children felt comfortable and could answer questions honestly, while avoiding judgmental expressions and gestures. Permission for audio recording was obtained from participants and parents before the interviews. All participants and parents consented to the audio recording.

Three semi-structured questions were prepared on the problems encountered by hospitalised children during sleep based on the literature.[1,7,14] Semi-structured interview questions are as follows: (1) How do you rate your sleep in the hospital environment? (2) What factors affect your sleep in the hospital environment? (3) How do the treatment and care practices (clinical routine procedures) in the clinic affect your sleep? (4) How have the

changes in your sleep pattern affected your complaints related to your illness? (5) What changes do you think should be made to be able to sleep better in the hospital? Please explain. In order to better understand the problems experienced by the children and to help them express their opinions, questions were asked such as "Can you explain what you want to say a little more?" and "What caused the problem you experienced?". The suitability of the questions was assessed by consulting two experts with associate professor titles in the field of paediatric nursing. Pilot interviews were conducted with children to evaluate the comprehensibility of the questions. The pilot interviews determined that the questions were understandable and did not require any revisions. The children who participated in the pilot interviews were not included in the analysis. The data collection process was completed using the determined questions and additional supporting questions.

Data analysis

Sociodemographic characteristics of the children were analyzed using descriptive statistics in SPSS 22 package program. Qualitative data analysis methods were used to evaluate the data obtained from the interviews. [40] Among the qualitative analysis methods, the thematic analysis method developed by Braun and Clarke was used.[41] Thematic analysis is a systematic analysis approach that aims to determine individuals' perspectives and interpretations of events/situations. It can be considered the most suitable method for analyzing the meanings of experiences and problems for individuals and the profound effects they have on them. In this research, thematic analysis was also used to investigate and relate various concepts and thoughts of children who experienced the earthquake. Data analysis was carried out in 5 stages. (1) After the interviews were completed, the researchers listened to the audio recordings repeatedly independently and transcribed them into computer text. (2) The written statements were read repeatedly by each of the three researchers independently, and the same/similar and different statements were grouped and coded. (3) As a result of the coding, each researcher independently created the themes. (4) After the analysis, meetings were held at regular intervals to bring together, discuss, and evaluate the findings. It was observed that the coding of all three researchers was consistent with each other. (5) Finally, the main and sub-themes of the study were determined. No software tools were used in the transcription of the interview recordings, data analysis, reporting of findings, and writing stages.

Trustworthiness and rigor

The research findings were tested to ensure reliability (verifiability, comprehensiveness, and consistency) and validity (transferability and credibility).[42-44] To ensure reliability, interviews were conducted by the same researcher, audio-recorded, and transcribed verbatim. Each researcher listened to the audio recordings several times and transcribed them. To ensure verifiability and consistency, data analyses were performed separately by the three researchers, and the findings were discussed in regular meetings. This approach was effective in evaluating the research findings from different perspectives and systematically constructing them. To ensure the comprehensiveness of the research findings, snowball sampling and purposive sampling methods were used, and preliminary interviews were conducted. These preliminary interviews enabled the determination, development, and revision of the appropriateness of the research questions. To ensure transferability, the sociodemographic characteristics of the participants were described, and the methods and findings section was presented in detail, with excerpts from the participants' conversations included in the findings. To ensure credibility, interviews were conducted at times and places where the children could express themselves comfortably. Audio recordings from one-on-one interviews with the children were transcribed. The transcribed statements were read back to the children to verify the spoken transcripts. Following the interviews, the findings were evaluated at regular intervals, and their consistency with other findings was analyzed. To enhance the transferability and reliability of the data, the interview contents were translated into English by a translator other than the authors, and then the Turkish

and English versions of the transcripts were compared.

Ethics committee approval

Ethical approval was obtained from İnönü University Health Sciences Non-Interventional Clinical Research Ethics Committee with the decision number 2022/3691. The purpose and content of the study were explained to the children and their parents who agreed to participate in the study. The participants were informed that they were free to participate in the study, that the data obtained from the voice recordings would be used for scientific purposes and that their personal information would be kept confidential. Verbal consent was obtained from the children who agreed to participate in the study and verbal and written consent was obtained from their parents. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Results

It was found that the mean age of the children who participated in the study was 11.7±2.32 years, %33.4 were girls, and the mean duration of hospitalisation was 2.7± 0.7. It was found that the children were hospitalised for acute gastroenteritis, diabetes, fever, infection, pain, epilepsy, leukaemia and the mean year of diagnosis of chronically ill children was 4.0±0.4. It was determined that 5 children were kept alone in a shared room (Table 1).

Table 1. Descriptive characteristics of children (n:30).

	N(%)	Mean±SD
Age(year)		11.7±2.32
Sex		
Female	10(33.4%)	
Male	20(66.6%)	
Duration of hospitalized(day)		2.7±0.7
Diagnosis		
Acute Gastroenteritis	10(33.3%)	
Diabetes	4(13.5%)	
Fever	5(16.6%)	
Pain	6(20.0%)	
Epilepsy	5(16.6%)	
Year of diagnosis of chronically ill children		4.0±0.4
Rooms		
Double/Shared	25(93.4%)	
Single	5(16.6%)	

As a result of the content analysis conducted in the study, two main and six sub-themes affecting the child's sleep were determined as follows: (1) Sleep status in the hospital environment; *a) Decrease in sleep duration b) Increase in sleep duration* (2) Factors affecting sleep status in the hospital *a) Environmental factors (noise, light, visitors, etc.) b) Disease-related factors (pain, nausea, vomiting, etc.) c) Clinical routines d) Emotional factors (anxiety, stress, longing)* (Table 2).

Table.2. Main and sub-themes of the study.

Main themes	Sub-themes	Codes
Sleep status in the hospital environment	• Decrease in the duration of sleep (n.21) • Increase in the duration of sleep (n:9)	Change
Factors affecting sleep status in the hospital	• Environmental factors (noise, light, visitors, etc.) (n: 18) • Disease-related factors (pain, nausea, vomiting, etc.) (n:12) • Routines of the clinic (n: 25) • Emotional factors (anxiety, stress, longing) (n:23)	Illness and the Hospital Environment

Duration of sleep

Decrease in the duration of sleep (n:21)

The majority of the children who participated in the study (21 children) stated that physical problems and being treated in hospital had a negative effect on sleep duration. They stated that they frequently woke up at night, fell asleep later and felt tired, especially with night treatments. They also stated that when they had treatments in the morning, they had to wake up early and felt tired during the day. The expressions of some of the children are as follows;

….. I have been in pain for a few days and I can't sleep regularly. I wake up constantly at night. My complaints have decreased since I was hospitalised, but tests and treatments still have a bad effect on my sleep patterns.…(Child 17)

My stomach hurts a lot and I feel nauseous all the time. I don't want to eat anything. It passes after I take medicine and I sleep, but when the pain starts again, it wakes me up from sleep. ...(Child 21)

Increase in the duration of sleep (n:9)

Some of the children who participated in the study stated that, unlike children with sleep problems, their complaints decreased due to the care and treatment practices in the hospital and that their sleep time in the hospital was longer than their sleep time at home. They stated that they slept better and felt rested especially with the decrease in their pain.

The expressions of children are as follows;

... My sleep has been better since I started taking my medication. I don't wake up at night with pain like at home. I feel more relaxed…(Child 11)

... I was worse at home. When I came here, my medication started to be done regularly and my nausea gradually decreased. I sleep longer and better in hospital than at home…(Child 14)

Factors affecting sleep health

Environmental factors (noise, light, visitors, etc.) (n:18)

The children stated that they were disturbed due to the noise caused by the busy state of the hospital during the day and that they could not rest. They stated that the activity could continue at night and the room light was always on, which made it difficult for them to fall asleep.

The ward is very busy and chaotic, especially during the day. My room is close to the nurses' room. For this reason, the noises disturb me a lot and I cannot sleep during the day. At night, the noises in the corridors of the ward continue and the light is always on because the relatives of other patients come in and out. I cannot sleep at night.(Child 8).

...At night, especially during treatment hours or when others enter the room, all the lights are switched on and I hear momentary sounds in the room...Then I fall asleep again, but sometimes I wake up and play with my phone….. (Child 14)

Children stated that sharing the same room with other children and their families affected their sleep patterns negatively, causing them to wake up frequently during sleep hours and to have problems falling asleep again.

…When we share a room with a small child, he cries all the time and his mum can't get him to stop. At night he wakes up and cries and my sleep is disturbed and I have to wake up...(Child 1)

.....It is very difficult to stay in the same room with other people. There is always chaos and noise. When I'm going to sleep, sometimes visitors come and I can't fall asleep. (Child 5).

Disease-related factors (pain, nausea, vomiting, etc.) (n:12)

The children stated that their symptoms increased with the onset of the disease and hospitalisation. They stated that their increased symptoms affected their sleep negatively and caused them to wake up frequently at night. It was found that they could not sleep for long hours at night due to the pain and nausea that occurred especially at night.

...I can't sleep when I have nausea at night. When I use medication, my nausea does not go away, I get even more nauseous and eventually I vomit the medicine.…(Child 27).

The pain keeps me awake a lot. I fall asleep very late. It can wake me up at three in the night. I can't fall back to sleep because of the pain in my stomach….(Child 24).

Routines of the clinic (n:25)

It was found that care, follow-up and treatment procedures at night and in the early hours of the morning caused children to wake up from sleep and experience inadequate and inefficient sleep. Children reported difficulties in falling back to sleep.

Early in the morning, the nurses come and measure my blood pressure, give me medicine or tell me that they need to take blood. I usually can't go back to sleep after giving blood. (Child 18).

I also have treatments at night. I have to wake up all the time. Since my treatment is intravenous, if there is a problem with my vascular access, they open a vascular access

again. Since I came to the hospital, my sleep patterns have been completely disrupted.(Child 9)

Emotional factors (anxiety, stress, longing) (n:23)

It was determined that children experienced negative emotions due to their hospitalization and had sleep problems due to the stress and anxiety they experienced. The children stated that they were unable to maintain their sleep routines at home.

The majority of children stated that they were anxious because of the frequent invasive diagnostic and treatment procedures performed in the hospital and that the noisy and chaotic hospital environment increased their anxiety. The children stated that being separated from their family members increased their anxiety.

They take blood every day and give medications through the intravenous line. My intravenous line constantly comes out and they open it again. I don't know how long my treatment will continue…. (Child 28)

Since the day I was treated at the hospital, my blood values have been problematic and do not improve despite the medications I take. I can't sleep at night anymore.(Child 30)

The children stated that being hospitalised and being away from their social environment caused stress for them. The children stated that they missed their family members, peers and friends and wished to be discharged from the hospital as soon as possible.

Since the day I was hospitalised, I've been thinking about when I'll get out. I also had to leave my friends…. (Child 15)

.....I don't like being hospitalised, no one can come to visit me. I get bored because I can't see anyone and the process is stressful for me. I'm always on the phone until very late…(Child 16)

I miss my brothers and sisters very much. They can't come to us. They are both small and the hospital is far from our house. I can only video chat on the phone…..(Child 25)

....Before I was diagnosed, I spent more time with my friends. After I was diagnosed I had to leave my friends. I am constantly hospitalised and have to leave my family….(Child 8)

Discussion

This study, conducted to determine the sleep patterns of children hospitalised in a hospital, is the first of its kind to examine changes in sleep patterns from the children's perspective. Adopting the children's perspective as the primary viewpoint has enabled significant findings to be drawn. The study found that children's sleep duration could decrease or increase, and that their sleep patterns were predominantly affected in a negative manner. It was found that emotional factors such as the course of illness, anxiety, stress and sadness, as well as the hospital's environmental setting and clinical routines, are key factors influencing children's sleep patterns. Our research findings align with those of several studies in the literature reporting that children's sleep is adversely affected.[9,22,32,34,45-47] In contrast, this study found that the hospital environment has a more positive effect than the home environment on establishing a sleep routine for some children. This research has helped paediatric nurses to assess children's sleep patterns during their hospital care, identify factors affecting sleep, and create an environment that enables them to sleep better.

Children in hospital may become overstimulated for a variety of reasons, and sleep sensitivity may develop. An observational study has shown that children in hospital go to sleep later in the evening, wake up at least twice during the night, and remain awake for approximately 55 minutes after waking.[48] In a qualitative study, parents reported that their children went to sleep much later in hospital and found it difficult to wake up in the morning.[21] As in many other studies, this research also found that children's sleep was predominantly (21 children) negatively affected. Unlike the literature, this study provides significant evidence that, whilst some children had poorer sleep efficiency at home, their sleep was positively affected by their hospital stay. It was observed that children's symptoms decreased and their sleep duration increased as a result of the care and treatment

provided in hospital. This suggests that children's symptoms can be better managed in a hospital setting than in a home environment. Meltzer et al. also reported in their study that some children were able to sleep more in hospital.[22] It is thought that this finding may help to reduce any preconceptions that parents and healthcare professionals might have regarding the negative effects of hospitalisation on children. At the same time, it serves as preliminary evidence of the significant impact that treatment and care approaches have on the positive sleep experiences of hospitalised children. For this reason, it is important for healthcare professionals managing the care processes of hospitalised children to identify the children's sleep patterns and the factors influencing them in order to manage the care process effectively.

Although some findings in our study differ from the literature, it appears that the vast majority of children experience negative sleep patterns. Current research reports indicate that children experience negative sleep patterns due to the complex and busy environment of the hospital, noise, light, strangers, treatment and care procedures, uncertainties regarding the disease process, and emotional factors.[9,32] In this study, it was found that one of the important factors affecting children's sleep health is the hospital's environmental setting. It was determined that the noise and light levels in the clinic were high enough to disturb the children and negatively affect their sleep patterns. Other studies also emphasize that noise and light levels in paediatric clinics are higher than recommended levels.[21,26,49,50] This study found that light intensity and the duration of light exposure have a negative impact on children's sleep health. Other studies have linked increased light intensity to reduced and fragmented sleep.[21,26,49] A qualitative study conducted with parents found that lights flickering frequently at night and lights remaining on continuously during sleep negatively affect children's sleep health.[49] This is because melatonin, which is secreted in the dark, is a key hormone involved in maintaining sleep-wake cycles and the circadian rhythm.[47] However, light left on at night disrupts melatonin secretion, leading to disturbances in wakefulness, body temperature and the circadian rhythm.[21,34] An observational study conducted in a paediatric oncology ward found that increased light intensity disrupts the circadian rhythm.[26] Therefore, it is important for paediatric nurses to carry out night-time care at a lower light intensity and to prevent frequent switching of the lights on and off, to ensure that children's circadian sleep patterns are not adversely affected.[31]

It is well known that noise is another important factor affecting children's sleep quality in a hospital setting. It is emphasised that the resulting noise can lead to a significant reduction in children's sleep duration, frequent awakenings, later bedtimes and earlier wake-up times.[22,32,34,46] This study also found that children frequently woke up at night and that the most significant factor causing these awakenings was noise. The factors contributing to noise were identified as frequent visitor comings and goings, the sounds of various devices, sharing a room with another child, and healthcare professionals administering care, treatment, and invasive procedures in the early morning or late at night. In this study, it was particularly noted that all the children were staying in shared rooms and generally reported sleep problems. This finding demonstrates the negative effects of shared rooms on children's sleep. Research has indicated that having children stay in single rooms may help prevent the negative effects that other patients and their relatives might cause.[46,49] A study found that children staying in single rooms had longer and more uninterrupted sleep durations compared to those in shared rooms.[34] A systematic review and meta-analysis report, however, provides strong evidence that the primary causes of poor-quality sleep in hospitalised children are noise and sharing a room. However, having children stay in single rooms is not always the solution.[46] It has been observed that, despite children being accommodated in single rooms, interventions carried out by healthcare professionals at inappropriate times exacerbate sleep problems.[21,46,48,49,51] This situation demonstrates that, as our research findings indicate, clinical routines can also have a negative impact on children's sleep. It is

thought that the number and frequency of daytime and night-time treatments at the clinic, routine examination and follow-up procedures, the sound of equipment running through the night, and visitor entry and exit procedures may negatively affect sleep quality in children.[9,25,27,32] In interviews with healthcare professionals, sleep problems in children were frequently reported due to care practices. It has been found that procedures carried out late at night disrupt children's sleep patterns, significantly negatively affecting their adaptation to treatment and care.[9,52] It is noted that the poor-quality sleep experienced by children is generally caused by modifiable factors and that these factors can be improved through nursing interventions.[9,25,27,32] Therefore, coordinating the entry and exit of healthcare professionals from patient rooms, particularly during late hours, conducting procedures with minimal noise, avoiding unnecessary interventions, carrying out necessary interventions in batches, and controlling visitor access are crucial for reducing sleep problems.[50]

Children receiving treatment in hospital may experience uncertainty, anxiety, stress, fear and homesickness due to separation from family members, symptoms of illness, the chaotic or noisy hospital environment, and the procedures they undergo.[22,53] A study has found that children fear falling ill and being admitted to hospital due to separation from family members, invasive procedures and symptoms of illness.[54] In qualitative studies, adolescents reported experiencing anxiety due to the disruption of routines and the possibility of a stranger entering their room during their hospital stay.[55,56] This study found that children experienced anxiety, stress and feelings of longing due to hospital admission, the hospital environment and their symptoms. It was also found that some children experienced uncertainty regarding the treatment and care of their illness. These negative emotions experienced by children following hospital admission may have adversely affected their sleep quality.[22,46,57] A case-control observational study reported that children receiving treatment at the hospital had sleep problems and that children experiencing anxiety had lower sleep efficiency.[32] In a study conducted on hospitalized children diagnosed with cancer, it was found that children with high levels of anxiety had significantly poorer sleep quality.[57] Findings from current research and the literature demonstrate that supporting children with interventions designed to reduce their fear, anxiety, and stress during hospitalization is essential for maintaining their sleep health.[33]

Our research findings also indicate that symptoms such as pain, nausea and vomiting experienced by children during their illness have a negative impact on their sleep. Numerous published research reports have indicated that chronic pain, nausea and vomiting in children significantly impair their sleep quality.[58-61] It has been found that persistent symptoms negatively affect sleep quality, thereby reducing the child's quality of life. Whilst the literature largely focuses on chronic symptoms, this study has determined that children's sleep begins to be adversely affected even in the presence of acute symptoms. It was observed that children whose pain decreased following the provision of treatment and care slept better, and in particular, the frequency of waking during the night decreased. This suggests that sleep problems may be reduced through the care provided by healthcare professionals responsible for the care of these children, based on symptom management. Given the impact of disease symptoms on children's sleep quality, the need to systematically provide treatment and care approaches that reduce the symptom burden is paramount.[62] In this process, paediatric nurses, who play an active role in the care of sick children, undertake significant responsibilities. Paediatric nurses must identify the environmental and individual factors that negatively affect sleep quality in children during the care process and take the necessary measures. It is also important to identify and develop factors that positively influence children's sleep. Planning clinical care and treatment routines with the aim of supporting children's sleep and reducing symptom burden can help minimise potential sleep problems in children.

Conclusion

The vast majority of children participating in the study reported experiencing sleep problems during their hospital stay and noted that there were many factors adversely affecting their sleep. Factors affecting sleep problems included symptoms of illness, the crowded and noisy hospital environment, painful procedures, interventions carried out at inappropriate times, sharing a room with another child and their family, and the high number of visitors coming and going from the hospital. It was also found that some children slept better because their symptoms had significantly improved following hospital admission.

It is important and essential for paediatric nurses to identify the factors that negatively affect the sleep of hospitalised children and to plan the care process using approaches that support their sleep. Identifying the factors that positively influence children's sleep in hospital and improving care in this regard can help reduce the negative impact of the hospital environment on children's sleep.

Limitations

The study was conducted at a single centre. The paediatric ward where the study was conducted provides treatment and care services for children with acute and chronic health problems. Both chronic and acute children were included in the study. Furthermore, the sleep patterns of children who stayed in the hospital for only a few days were investigated. This may have limited the gradual examination of the effects of the hospital environment on children's sleep. There is insufficient information available regarding the return to normal sleep patterns after discharge for children experiencing sleep problems. Longer-term follow-up studies may yield significant results. Also, the study primarily included children with acute health problems. The experiences of children who had to stay in the hospital longer due to chronic health problems and who underwent more intensive treatment and care processes may yield more striking results.

Ethics Committee Approval

This study was approved by Health Sciences Non-Interventional Clinical Research Ethics Committee of a university with the number 2022/3691.

Informed Consent

Verbal consent was obrained from the children participating in the study. Written and verbal consent was obtained from their parents.

Author Contributions

Study design: U.G., S.Ö., D.C.Ş. Data collection: S.Ö. Data analysis: U.G., S.Ö., D.C.Ş. Study supervision: U.G. Manuscript writing: U.G., S.Ö., D.C.Ş. Critical revisions for important intellectual content: U.G., S.Ö., D.C.Ş.

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Conflict of Interest Statement

We have no personal relationships or financial interests that could influence the results of the research reported in this article.

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Peer-review

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