

Volume 9, No. 1
April, 2026

e-ISSN : 2685-1997
p-ISSN : 2685-9068

REAL in Nursing Journal (RNJ)

Research of Education and Art Link in Nursing Journal

<https://ojs.fdk.ac.id/index.php/Nursing/index>

Improving Sleep Pattern Disturbance in a Hospitalized Child through Sleep Hygiene Intervention: A Case Study

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ABSTRACT

Background: Hospitalization in children often leads to sleep disturbances due to environmental changes, medical procedures, noise, lighting, and psychological stress. Poor sleep quality during hospitalization may delay recovery, worsen clinical conditions, and increase the risk of behavioural and emotional problems. Sleep hygiene intervention has been identified as a simple, low-cost, and non-pharmacological approach to improve sleep quality in various populations, including children.

Purpose: This study aimed to evaluate the effectiveness of sleep hygiene intervention in improving sleep quality and sleep duration among hospitalized children.

Methods: This study employed a case study design involving two paediatric patients experiencing sleep disturbances during hospitalization. The intervention was implemented over three consecutive days. Sleep quality was measured before and after the intervention using the Pittsburgh Sleep Quality Index (PSQI). Sleep duration was also observed and recorded daily. Data were analysed descriptively by comparing pre- and post-intervention PSQI scores and changes in sleep duration.

Results: The findings demonstrated a consistent decrease in PSQI scores in both patients. Initial scores of 13 and 14 decreased by 2 points each day, resulting in total reductions of 9 points and 8 points, respectively. Additionally, the average sleep duration increased from 3.5-4.5 hours to 5-6 hours after the intervention. These results indicate gradual improvement in sleep quality and continuity.

Conclusion: Sleep hygiene intervention effectively improved sleep quality and duration among hospitalized children. This intervention can be integrated into pediatric nursing care as a practical and cost-effective strategy to support recovery and enhance overall well-being.

Keywords:

Children; Hospitalization;
Sleep Hygiene; Sleep
Quality

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Introduction

Sleep pattern disturbance in children is defined as a cluster of symptoms characterized by irregularities in sleep quantity, quality, and timing (Sutriyanti 2019). Globally, the prevalence of sleep disorders in children remains high. Data indicate that the prevalence of sleep disturbances among preschool children

in 17 countries ranges from 20-30%, while in Indonesia it reaches 44.2%. Furthermore, approximately 20-50% of school-aged children experience sleep problems each year, with 17% classified as having serious sleep disorders (World Health Organization 2018). Sleep problems are also reported in one-quarter of parents with children under



five years old and are associated with behavioral problems, decreased academic performance, and obesity (Bathory and Tomopoulos 2017).

Sleep is a fundamental physiological need that plays a crucial role in physical growth, brain development, emotional regulation, and energy restoration in children. Sleep requirements vary according to age: newborns require 16-20 hours per day, infants 14-15 hours, preschool children 11-12 hours, and school-aged children 10-11 hours (Joan Herly Herwawan, Reni Chairani, and Syamsul Anwar 2021). Inadequate sleep may lead to diverse clinical manifestations, ranging from daytime sleepiness to hyperactive behavior. Children may become irritable, less cooperative, inattentive, difficult to manage, and exhibit aggressive or impulsive behaviors that negatively affect cognitive and emotional functioning (Sudarta and Syafruddin 2023). Long-term consequences include impaired growth, decreased concentration, increased risk of depression, and emotional instability (Natalita, C 2019).

Sleep problems become more complex during hospitalization. Hospital care often separates children from familiar environments, induces stress, and disrupts daily routines (Kartono, Damayanti, and Nufus Sholihah 2022). An unfamiliar hospital environment, excessive noise, inappropriate lighting, nighttime medical procedures, and underlying illness all contribute to poor sleep quality and quantity. As a result, children frequently become irritable, experience difficulty falling asleep, and

show decreased rest quality (Tiala, Suryaningsih, and Suntain 2022). Insufficient sleep during hospitalization may further worsen clinical conditions, delay recovery, and increase the risk of stress and behavioral disturbances. Previous studies have reported that sleep disturbances in hospitalized children are largely associated with modifiable external factors, such as nursing care activities and noise from medical equipment or other patients (Hybschmann et al. 2021).

One non-pharmacological approach to addressing sleep disturbances is sleep hygiene. This intervention focuses on behavioral and environmental modifications to create optimal sleep conditions through consistent sleep schedules, structured bedtime routines, and supportive environmental adjustments (Tiala et al. 2022). Sleep hygiene practices include maintaining regular bedtimes, using dim lighting at night, ensuring bed cleanliness, limiting electronic device use, avoiding heavy meals or caffeinated beverages before bedtime, and regulating daytime naps. Parental involvement is also essential in establishing healthy sleep routines, such as reading bedtime stories or accompanying the child until sleep onset (Daulay, Yusrita, and Kusuma 2024). Evidence suggests that this intervention enhances comfort and improves sleep quality, particularly during hospitalization.

Previous studies have demonstrated a high prevalence of sleep disturbances among hospitalized children. Farasari et al. (2022) reported that 63.6% of children aged 3-6 years experienced

sleep problems prior to receiving sleep hygiene intervention, primarily influenced by hospital environmental factors such as noise, excessive lighting, and medical procedures. Following the implementation of sleep hygiene therapy, 51.5% of children no longer experienced sleep disturbances, indicating a positive effect on sleep quality.

Despite this evidence, sleep needs in hospitalized children have not always been prioritized in nursing care. Healthcare providers often focus primarily on physical conditions and medical treatment, while sleep problems are frequently regarded as a temporary consequence of hospitalization. In fact, adequate sleep is an important part of the healing process and children's well-being during hospital care. Thus, pediatric nursing care should not only emphasize disease management but also address the fulfillment of children's basic physiological needs, including sleep, through a holistic approach.

This study is important because it addresses sleep pattern disturbance in hospitalized children as a common yet often underrecognized clinical problem. The novelty of this study lies in the application of a case study approach to the implementation of sleep hygiene in a hospitalized child, thereby providing a more in-depth, contextual, and practice-oriented description of the intervention. Unlike previous studies that mainly focused on prevalence or intervention effectiveness at the group level, this study emphasizes individualized nursing care and the

patient's response to the intervention. In addition, this study uses a modified Pittsburgh Sleep Quality Index (PSQI) consisting of several components, including sleep quality, sleep latency, sleep duration, sleep habits, sleep disturbances, and daytime dysfunction, allowing for a more comprehensive assessment of the child's sleep pattern.

The urgency of this study is based on the high prevalence of sleep disturbances in children and the considerable impact of poor sleep on physical condition, emotional well-being, and recovery during hospitalization. Hospitalized children are particularly vulnerable to sleep disturbance due to a combination of illness, stress, and environmental disruption. If not managed properly, sleep problems may worsen children's responses to treatment, increase discomfort, and delay recovery. Therefore, feasible, safe, and evidence-based interventions are needed to support the quality of pediatric nursing care. Based on these considerations, this study aims to describe the implementation of sleep hygiene intervention in managing sleep pattern disturbance in a hospitalized child through a case study approach.

Methods

Research design

This study employed a case study design to comprehensively examine the implementation of sleep hygiene intervention in pediatric nursing care for children experiencing sleep pattern disturbances in the inpatient ward. The case study design was selected because it allows for an in-depth and holistic



observation of the patient's condition, the nursing care process provided, and the changes in sleep patterns following the intervention.

Through this approach, the researcher was able to identify specific sleep disturbances experienced by the patient, explore contributing factors, systematically plan and implement sleep hygiene interventions, and evaluate outcomes based on the patient's clinical responses. The case study method also facilitated detailed documentation of behavioral, environmental, and physiological changes occurring during hospitalization. Therefore, this design was considered appropriate for providing a comprehensive understanding of the effectiveness of sleep hygiene as a nursing intervention in improving sleep quality among hospitalized children..

Setting and samples

This study employed a descriptive case study design aimed at exploring in depth the implementation of sleep hygiene intervention in managing sleep pattern disturbances among hospitalized children. This approach was selected because it enables comprehensive assessment, systematic intervention implementation, and structured evaluation of patient responses within a real clinical context. The study was conducted from October 27-29, 2025, at a regional referral hospital in Riau Province, Indonesia, specifically in the pediatric inpatient ward (Anggrek Ward). The research site was chosen based on the availability of hospitalized pediatric patients and a supportive environment that allowed the structured

implementation of sleep hygiene interventions.

This study adopted a purposive sampling technique to select participants who met criteria relevant to the study objectives. The accessible population included all pediatric patients admitted to the pediatric ward during the study period. Given the case study design, participant selection was not intended to achieve statistical representation, but to allow an in-depth exploration of the implementation of sleep hygiene in clinically relevant cases. Two hospitalized children were ultimately included because they demonstrated sleep pattern disturbances during hospitalization, were in stable clinical condition, cooperative, and had family members willing to support participation in the intervention process.

Participant recruitment was conducted by the researcher in collaboration with the nurse in charge of the ward, beginning with an initial screening followed by further assessment to confirm eligibility. The inclusion criteria were: hospitalized pediatric patients, presence of sleep pattern disturbances, stable clinical condition, and parental or guardian consent. The exclusion criteria were: critical illness or need for intensive care, severe neurological or developmental disorders that could substantially affect sleep patterns, and uncooperative condition or decreased level of consciousness. In line with the nature of a case study, the final sample consisted of two participants, enabling a detailed analysis of each case. Data were collected through sleep pattern

assessment using a modified questionnaire and direct observation during the implementation of the sleep hygiene intervention. Changes in sleep patterns were then evaluated to examine the intervention's effectiveness over the study period.

Intervention (applies to experimental studies)

The intervention implemented in this study consisted of the application of sleep hygiene as part of nursing care to manage sleep pattern disturbances in pediatric patients during hospitalization in the pediatric inpatient ward. The intervention aimed to create environmental conditions and behavioral habits that support more comfortable, higher-quality sleep appropriate to the child's developmental needs. Prior to the intervention, an initial assessment of the child's sleep pattern was conducted through clinical observation, interviews with parents or guardians, and the use of a screening instrument modified from the Pittsburgh Sleep Quality Index (PSQI). The findings from this assessment served as the basis for planning individualized sleep hygiene strategies tailored to each patient's condition and needs.

The sleep hygiene intervention was carried out for three consecutive days, from 27 to 29 October 2025, in the Anggrek ward. The intervention was implemented by the researcher in collaboration with ward nurses, with the active involvement of parents or guardians. Sleep hygiene practices were applied in a structured manner by optimizing the sleep environment, including reducing noise around the

bedside, minimizing excessive nighttime lighting, and creating a calmer and more comfortable room atmosphere. In addition, a more consistent sleep schedule was established according to the child's clinical condition, and stimulating activities before bedtime, such as the use of electronic devices, were limited. Parents or guardians were also provided with education regarding the importance of maintaining regular sleep routines and engaging in calming pre-sleep activities, such as reading bedtime stories, providing comforting touch, or practicing age-appropriate relaxation techniques. They were encouraged to actively support and reinforce these structured sleep practices throughout the intervention period.

The intervention was carried out continuously during the observation period, with regular monitoring of patient responses. Evaluation was conducted through direct observation, nursing progress notes, and parental reports concerning sleep duration, sleep latency, frequency of nighttime awakenings, and overall sleep quality. As this study employed a case study design, no control group was included. The primary focus was an in-depth evaluation of sleep hygiene implementation in specific clinical cases. All research procedures adhered to ethical principles, including obtaining informed consent from parents or guardians, ensuring participant confidentiality, and confirming that the intervention did not interfere with ongoing medical treatment.

Measurement and data collection;



Data collection in this study was conducted using several instruments, including a nursing assessment form, a sleep pattern observation sheet, a modified Pittsburgh Sleep Quality Index (PSQI) questionnaire, and a sleep hygiene implementation record format. These instruments were utilized to identify patient characteristics, assess the presence of sleep pattern disturbances, monitor the implementation of the intervention, and evaluate changes in sleep patterns during hospitalization in the inpatient ward. Sleep quality was assessed using a modified version of the PSQI adapted to the objectives of the study. The PSQI scores were interpreted into three categories: scores of 0-4 indicated good sleep quality or no significant sleep disturbance; scores of 5-10 were categorized as poor sleep quality, indicating mild to moderate sleep disturbances; and scores above 10 reflected poor sleep quality with significant sleep disturbances. These categories served as the basis for determining the severity of sleep pattern disturbances before and after the implementation of the sleep hygiene intervention.

The research instruments were adapted and modified based on the nursing diagnosis framework established by the Indonesian National Nurses Association (PPNI), referring to the Standar Diagnosis Keperawatan Indonesia (SDKI) (Tim Pokja SDKI DPP PPN 2016), Standar Luaran Keperawatan Indonesia (SLKI) (Tim Pokja SLKI DPP PPNI 2018), and Standar Intervensi Keperawatan Indonesia (SIKI) (Tim Pokja SIKI DPP PPNI 2018). Adjustments were

made in accordance with the study objectives and the characteristics of pediatric patients. Additionally, the sleep hygiene guidelines applied in this study were based on nursing literature and previous research concerning sleep hygiene implementation in pediatric clinical settings. Sleep patterns were measured using several indicators, including nighttime sleep duration, frequency of nighttime awakenings, sleep latency, and subjective sleep quality based on parental reports and direct observation. Data were recorded using categorical scales (good, fair, poor) according to predetermined indicators on the observation sheet. Interpretation was conducted by comparing pre- and post-intervention conditions to identify changes in sleep patterns.

Data were collected through direct observation, structured interviews with parents, and review of nursing documentation during hospitalization. All data collection procedures were carried out directly by the researcher without involving assistants. Observations were conducted daily to monitor changes following the sleep hygiene intervention. The collected data were analyzed descriptively to illustrate the nursing care process and the outcomes of the intervention in pediatric patients.

Data analysis;

Data analysis in this study was conducted descriptively in accordance with the case study design, which emphasizes an in-depth exploration of changes in patients' sleep patterns following the implementation of the

sleep hygiene intervention. The analysis process began with compiling all data obtained from the nursing assessment forms, sleep pattern observation sheets, modified Pittsburgh Sleep Quality Index (PSQI) questionnaires, and sleep hygiene implementation records. All collected data were reviewed and verified to ensure completeness and consistency. Subsequently, data reduction was performed by selecting and focusing on information relevant to the study objective, namely changes in sleep patterns before and after the intervention. Data related to key indicators—such as sleep duration, sleep latency, frequency of nighttime awakenings, and subjective sleep quality—were separated and grouped according to the time of measurement (pre-test and post-test).

The grouped data were then organized into tables to facilitate comparison. Pre-test and post-test scores for each observation day were compared to determine the magnitude of change or reduction in sleep disturbance scores following the implementation of sleep hygiene. The differences in scores were calculated to identify trends in daily improvement. The next stage involved data interpretation, in which patterns of score reduction were analyzed descriptively to assess the consistency of changes throughout the intervention period. A decrease in scores was

interpreted as an improvement in the patient's sleep quality. During this process, supporting and inhibiting factors encountered during the intervention were also considered.

The final stage of analysis involved drawing overall conclusions based on the comparison and interpretation of the data. These conclusions were used to describe the effectiveness of the sleep hygiene intervention in reducing sleep pattern disturbances among pediatric patients during hospitalization.

Results

Based on the assessment conducted on two preschool-aged pediatric patients hospitalized in the Anggrek Ward of Arifin Achmad Regional General Hospital, Riau Province, data were obtained regarding patient identity, physical condition, and sleep pattern characteristics during hospitalization. Both patients exhibited sleep pattern disturbances characterized by difficulty initiating sleep, frequent nighttime awakenings, and inadequate sleep duration. In addition, medical conditions and environmental factors within the inpatient setting were identified as contributing factors affecting the patients' sleep quality.

The results of the physical examination and comprehensive assessment findings for both patients are presented in Table 1 below.

Table 1. Demographic Characteristics, Clinical Conditions, and Sleep Pattern Assessment of Hospitalized Preschool Children

Assessment Component	Patient 1	Patient 2
Age	5 years	6 years
Sex	Male	Female
Diagnosis Medis	Pneumonia	Acute Gastroenteritis
Sleep-Related Complaints	Difficulty initiating sleep, frequent nighttime awakenings, restlessness before bedtime	Difficulty sleeping since admission, waking every 1-2 hours, crying and asking to go home
Level of Consciousness	Compos mentis (GCS 15)	Compos mentis (GCS 15)
Blood Pressure	98/60 mmHg	96/64 mmHg
Respiratory Rate	26 breaths/min	24 breaths/min
Pulse Rate	102 beats/min	100 beats/min
Temperature	37,2° C	37° C
Weight	16 kg	15 kg
Height	104 cm	108 cm
Sleep Pattern	Night sleep 4-5 hours, excessive daytime napping	Night sleep 3-4 hours
Environmental Factors	Noisy room, bright lighting	Unfamiliar and uncomfortable hospital environment

Based on Table 1, the findings indicate that both preschool-aged children hospitalized in the Anggrek Ward of Arifin Achmad Regional General Hospital, Riau Province, experienced sleep pattern disturbances during their hospital stay. Initial assessment revealed difficulty initiating sleep, frequent nighttime awakenings, and inadequate sleep duration compared to age-appropriate sleep requirements.

Patient 1, diagnosed with pneumonia, demonstrated sleep disturbances characterized by nighttime sleep limited to 4-5 hours, frequent awakenings, and restlessness before bedtime. These disturbances were influenced by physical complaints such as coughing and shortness of breath, as well as environmental factors including a noisy room and excessive lighting. Meanwhile, Patient 2, diagnosed with

acute gastroenteritis (AGE), experienced shorter nighttime sleep duration of 3-4 hours, frequent awakenings every 1-2 hours due to abdominal pain and increased bowel movements, and discomfort related to the unfamiliar hospital environment.

These findings illustrate the severity of sleep disturbances experienced by both patients prior to intervention. Furthermore, this study describes changes in the level of sleep pattern disturbances over three days following the implementation of the sleep hygiene intervention in the inpatient ward. Sleep quality was measured using a modified Pittsburgh Sleep Quality Index (PSQI), with assessments conducted before (pre-test) and after (post-test) the intervention each day. The detailed results are presented in Table 2.

Table 2. Changes in Sleep Disturbance Scores Based on Modified PSQI Assessment Before and After Sleep Hygiene Intervention

Day / Date	Patient	Pre-Test (PSQI)	Post-Test (PQSI)	Score Reduction
Day 1, Monday (27 October 2025)	Patient 1	13	11	2
Day 1, Monday (27 October 2025)	Patient 2	14	12	2
Day 2, Tuesday (28 October 2025)	Patient 1	10	8	2
Day 2, Tuesday (28 October 2025)	Patient 2	11	9	2
Day 3, Wednesday (29 October 2025)	Patient 1	6	4	2
Day 3, Wednesday (29 October 2025)	Patient 2	8	6	2

Based on Table 2, the results of sleep quality measurement using the Pittsburgh Sleep Quality Index (PSQI) demonstrate a consistent decrease in scores for both patients over the three-day intervention period. On Day 1, the pre-test scores were 13 for Patient 1 and 14 for Patient 2, indicating poor sleep quality. Following the intervention, the post-test scores decreased to 11 and 12, respectively, reflecting a 2-point reduction for each patient. On Day 2, further improvement was observed. The pre-test scores declined compared to the previous day, with Patient 1 scoring 10 and Patient 2 scoring 11. After the intervention, the post-test scores decreased to 8 and 9, respectively, again demonstrating a consistent 2-point reduction in both patients. By Day 3, more substantial improvement was

evident. The pre-test score for Patient 1 decreased to 6 and for Patient 2 to 8. Post-test scores further declined to 4 and 6, respectively, maintaining the consistent 2-point reduction per intervention session.

Overall, both patients exhibited a steady downward trend in PSQI scores across the three days, reflected in both pre-test and post-test measurements. The total reduction from Day 1 to Day 3 was 9 points for Patient 1 (from 13 to 4) and 8 points for Patient 2 (from 14 to 6). This consistent decline indicates gradual improvement in sleep quality throughout the intervention period. The repeated 2-point reduction following each session suggests that the sleep hygiene intervention had a positive and sustained effect on enhancing sleep quality in hospitalized pediatric patients.

Table 3. Average Changes in Sleep Duration and Sleep Disturbance Among Hospitalized Children

Patient	Sleep Duration (Pre-Test)	Sleep Duration (Post-Test)	Average Increase	Perubahan gangguan tidur
Patient 1	4-5 hours	6 hours	1,5 hours	More relaxed, less irritable, decreased frequency of awakenings
Patient 2	3-4 hours	5 hours	1,5 hours	Less afraid to sleep alone, reduced daytime naps, fresher facial expression
Average	3,5- 4.5 hours	5- 6 hours	1,5 hours	Improvement in sleep pattern disturbances

Based on Table 3, an increase in sleep duration was observed in both patients following the implementation of the sleep hygiene intervention. In patient AN.R, sleep duration improved from 4-5 hours to 6 hours, while in patient AN.L it increased from 3-4 hours to 5 hours. Both patients demonstrated an average increase of 1.5 hours of sleep. In addition to the extended sleep duration, notable clinical improvements were observed. The children appeared more relaxed, less irritable, and experienced fewer nighttime awakenings. One patient was no longer afraid to sleep alone, and both appeared physically fresher and more comfortable during the day.

Overall, the average sleep duration increased from 3.5-4.5 hours to 5-6 hours, indicating a meaningful improvement in sleep pattern disturbances during hospitalization. These findings suggest that the sleep hygiene intervention contributed positively not only to longer sleep duration but also to better overall sleep quality and behavioral stability in hospitalized preschool children.

Discussion

Based on the results of sleep quality measurement using the Pittsburgh Sleep Quality Index (PSQI), a consistent decrease in scores was observed in both patients over the three-day intervention period. The initial (pre-test) scores were 13 for Patient 1 and 14 for Patient 2. After the first day of intervention, both patients experienced a 2-point reduction in their scores. This pattern continued on the second and third days, with each intervention session resulting in a further 2-point decrease for both patients. Cumulatively, by the end of the third day, Patient 1 demonstrated a total reduction of 9 points, while Patient 2 showed a reduction of 8 points. The progressive decline in PSQI scores indicates a gradual and sustained improvement in sleep quality throughout the intervention period. The consistent 2-point reduction following each session suggests that the sleep hygiene intervention exerted a positive and cumulative effect on improving sleep patterns and overall sleep quality among hospitalized children.

The findings of this study are consistent with previous research (Tiala et al. 2022) reported that interventions

focusing on sleep hygiene have a positive impact on sleep quality, including in pediatric populations. Similarly, (Harmoniati, Sekartini, and Gunardi 2016) found that sleep hygiene interventions improved daytime sleepiness, mood, difficulty waking in the morning, and produced significant differences in Sleep Disturbance Scale for Children (SDSC) scores before and after intervention. In addition, (Irish et al. 2016) emphasized that sleep hygiene education represents an effective strategy for improving sleep health on a broader scale. These findings suggest that structured and consistent sleep hygiene interventions can minimize external factors that disrupt sleep during hospitalization and foster more adaptive sleep habits. Therefore, sleep hygiene may be considered an integral component of pediatric nursing care to support recovery and enhance rest quality during hospital stays.

The present study also demonstrated that the average sleep duration increased from 3.5-4.5 hours to 5-6 hours following the intervention. This improvement indicates a reduction in sleep pattern disturbances experienced during hospitalization. Longer sleep duration reflects fewer nighttime awakenings and improved sleep continuity, both of which are critical indicators of restorative sleep in children. Meeting adequate sleep needs may contribute to greater physical and psychological stability during treatment..

These results are in line with findings by (Ito-masui et al. 2023), who reported improved sleep quality as evidenced by a reduction in Pittsburgh Sleep Quality

Index scores from 8.74 to 7.84 after intervention. Similarly, (Issa et al. 2023) found that sleep hygiene interventions reduced sleep latency, decreased daytime dysfunction, and enhanced subjective sleep quality, leading to more efficient and restful sleep. Furthermore, (Pfeiffer, Triplett, and Schaefer 2026) highlighted that integrating sleep hygiene principles—such as maintaining consistent sleep schedules and optimizing the sleep environment—can also improve mental health outcomes and overall life satisfaction.

The importance of the evaluation results lies in their demonstration that sleep hygiene has practical value in improving sleep among hospitalized children. The observed changes after the intervention show that sleep disturbances during hospitalization can be addressed not only through medical treatment, but also through simple nursing measures targeting modifiable environmental and behavioral factors. This finding is important because sleep is a basic physiological need that directly influences recovery, emotional well-being, and children's ability to cope with hospitalization. The implication for nursing care is that sleep assessment should be considered an essential component of pediatric nursing practice, and sleep hygiene should be incorporated into routine care. Nurses are expected to reduce nighttime environmental disturbances, organize care activities more effectively to avoid unnecessary sleep interruption, and educate parents or caregivers to support structured bedtime routines. Therefore, the results reinforce the role of nursing care in providing not only physical

treatment but also a therapeutic environment that supports rest, recovery, and better patient outcomes.

Implication and limitations

The findings of this study indicate that the implementation of sleep hygiene as part of nursing care has positive implications for improving both sleep quality and sleep duration among hospitalized children. Practically, this intervention can be integrated into pediatric nursing care standards as a safe, non-pharmacological approach that is easy to implement and does not require substantial additional costs. The application of sleep hygiene principles such as maintaining consistent sleep schedules, reducing nighttime noise and lighting, and creating a comfortable sleep environment has been shown to support more optimal rest in pediatric patients.

For nurses, these findings provide empirical evidence that environmental modification, structured bedtime routines, and parental education contribute to the reduction of sleep pattern disturbances. Parental involvement in the implementation of the intervention further reinforces the family-centered care approach in pediatric nursing practice, in which families actively participate in the child's care and recovery process. Collaboration between nurses and parents plays a crucial role in ensuring consistency and sustainability of the intervention during hospitalization. Clinically, improvements in sleep patterns have the potential to support the healing process, enhance patient comfort, and reduce the risk of stress

and behavioral disturbances during hospital care. Adequate sleep contributes to the stabilization of both physical and psychological conditions, thereby facilitating recovery. Furthermore, these findings may serve as a foundation for developing clinical protocols or guidelines for implementing sleep hygiene interventions in pediatric inpatient settings as part of standardized nursing care.

Nevertheless, several limitations should be acknowledged. The case study design with a very limited sample size (two participants) restricts the generalizability of the findings. The relatively short intervention period of three days does not allow for evaluation of long-term effects. Additionally, sleep quality measurements were partially based on parental subjective reports, which may introduce perceptual bias. The absence of a control group also limits the ability to compare outcomes with patients who did not receive the intervention. Therefore, further research employing experimental designs, larger sample sizes, and longer observation periods is recommended to strengthen the evidence regarding the effectiveness of sleep hygiene interventions in addressing sleep disturbances among hospitalized children.

Conclusion

Based on the findings of this study, it can be concluded that the implementation of sleep hygiene as part of nursing care is effective in reducing sleep pattern disturbances among hospitalized children. This is evidenced

by the consistent decrease in Pittsburgh Sleep Quality Index (PSQI) scores over the three-day intervention period, as well as an average increase in sleep duration of 1.5 hours in both participants. Additionally, clinical improvements were observed, as indicated by the children appearing more relaxed, less irritable, experiencing fewer nighttime awakenings, and demonstrating an overall fresher general condition.

The sleep hygiene intervention—implemented through environmental modification, establishment of consistent bedtime routines, and parental education and involvement—demonstrated positive effects on sleep quality in the pediatric inpatient setting. Although this study was limited by a case study design, a small sample size, and a short observation period, the findings suggest that sleep hygiene represents a simple, safe, and practical non-pharmacological intervention in pediatric nursing practice. Therefore, integrating sleep hygiene into standard nursing care is recommended to support the healing process and enhance comfort among children during hospitalization.

Acknowledgments

The author would like to express sincere gratitude to the hospital management and nursing staff of the pediatric ward for their support and cooperation during the implementation of this study. Special appreciation is extended to the clinical preceptor and supervising lecturer for their valuable guidance, constructive feedback, and continuous encouragement throughout the research process. The author is also

deeply grateful to the patients and their parents or guardians who willingly participated in this study and provided valuable information during the data collection process. Their cooperation and trust made this research possible.

Author contribution

Intan Tiara Ramadhan contributed to the conceptualization of the study, development of the methodology, data collection, data analysis, and primary drafting of the manuscript. Gita Adelia contributed to the study design, supervised the data collection process, performed data validation, and was responsible for the critical revision and appraisal of the manuscript, as well as granting final approval of the version to be published. Yureya Nita provided methodological guidance, assisted in data interpretation, reviewed the manuscript, and offered academic supervision throughout the research process. Nina Trisnawati contributed through project supervision and conceptual refinement of the study..

Conflict of interest

The authors declare that there are no conflicts of interest, either financial or non-financial, that could have influenced the implementation, analysis, or reporting of this study. This research was conducted independently and solely for scientific purposes and the advancement of nursing practice.

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