

Section: General Nursing

Infant massage to improve sleep quality in infant with sleep disturbances

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Abstract

Sleep is a subconscious state from which a person can be awakened by sensory stimulation and which occurs cyclically over a period of time. Infant sleep pattern disorders are characterized by a night time sleep duration of less than nine hours, waking up more than three times, and remaining awake for more than one hour per episode. Globally, approximately 30% of mothers report sleep problems in their infants, while in Indonesia, about 44.2% of infants experience disturbed sleep patterns characterized by frequent night time awakenings. Infancy represents a golden period for child growth and development that requires specialized attention. A critical factor influencing this development is the quality and quantity of rest, as sleep needs must be evaluated from both aspects. This case study aims to describe the application of baby massage on the sleep quality of an infant aged 0–6 months presenting with a nursing diagnosis of sleep pattern disorder in the Aster Room at Muntilan Hospital, Magelang Regency. This study utilized a case study approach evaluating a complementary therapy integrated with evidence-based practice to support the clinical implementation. The subject of this case study was a single infant patient experiencing a sleep pattern disorder. The intervention demonstrated that the application of baby massage effectively improved the sleep quality of the infant aged 0–6 months. Based on the clinical evaluation, baby massage is an effective intervention for enhancing sleep quality and resolving sleep pattern disorders in infants.

Keywords: Massage, nursing care, paediatric nursing, sleep disturbances, sleep quality

Introduction

The infancy period, spanning from 0 to 12 months of age, is a critical and sensitive phase of human development characterized by its rapid pace and unrepeatability (Bornstein, 2014). During this formative year, sleep and rest are paramount to achieving optimal growth and development (Tham et al., 2017). However, infant sleep disturbances remain a widespread issue. According to data, a significant number of infants suffer from sleep difficulties, with approximately 30% of mothers globally reporting sleep problems in their babies (Williamson et al., 2019). In Indonesia, this issue affects roughly 44.2% of infants, who exhibit disturbed sleep patterns primarily characterized by frequent night time awakenings. Clinically, these sleep disorders are identified by a total night time sleep duration of less than nine hours, waking up more than three times a night, or remaining awake for over an hour during the night (Khamenehpour et al., 2025). Infants experiencing these disruptions often appear fussy, cry frequently, and struggle to fall back to sleep. To mitigate these sleep disturbances, infant massage serves as a highly effective, non-pharmacological intervention (Rezaei et al., 2023). Massage stimulates the release of endorphins, which naturally lower stress and pain levels, thereby soothing the infant and reducing crying (Weerakul et al., 2025). Furthermore, it triggers an increase in serotonin levels. As a primary neurotransmitter, serotonin helps induce sleep by suppressing the brain's reticular activating system and calming overall neural activity. Consequently, infants who receive a massage for just 15 minutes or more experience a noticeable shift toward relaxation (Sheidaei et al., 2016), leading to a significant improvement in both the quality and quantity of their sleep, which ultimately fosters healthier long-term growth and development.

Integrating infant massage therapy into hospital settings, particularly within neonatal intensive care units (NICUs) and pediatric wards, is a crucial intervention because the clinical environment is inherently disruptive to an infant's neurodevelopment and sleep-wake cycles. Hospitals are high-stimulus environments characterized by continuous overhead lighting, frequent medical alarms, intrusive vital sign checks, and painful diagnostic procedures. This constant sensory overload elevates the infant's cortisol (stress hormone) levels, keeping their nervous system in a prolonged state of fight-or-flight, which severely fragments their sleep. When sleep is compromised in a hospitalized infant, their physiological healing is delayed, as cellular repair and tissue growth predominantly occur during deep slow-wave sleep. By implementing infant massage in the hospital, nurses can provide a deliberate, predictable, and calming tactile stimulus that counteracts this environmental stress. The systematic stroking lowers the infant's heart

rate, stabilizes respiration, and decreases sympathetic nervous system activity, helping the hospitalized infant transition from a state of hypervigilance into the restorative deep sleep cycles necessary for a faster medical recovery.

Furthermore, hospital-based infant massage acts as a powerful, non-pharmacological clinical tool that mitigates the long-term adverse effects of prolonged hospitalization, while actively involving families in patient care. In pediatric nursing, relying solely on pharmacological sedatives to induce sleep in distressed infants carries risks of dependency, altered neurological development, and medication side effects. Massage therapy offers a safe, evidence-based alternative that stimulates the vagus nerve, which not only enhances gastrin and insulin secretion to improve feeding tolerance and weight gain in hospitalized infants, but also naturally optimizes melatonin production for better circadian regulation. Crucially, teaching and performing this therapy at the bedside serves as an invaluable intervention for family-centered care. Hospitalization often disrupts the natural bonding process, leaving parents feeling helpless, anxious, and disconnected from their sick child. When nurses integrate massage therapy into the care plan and train parents to perform it, it empowers the family unit, reduces parental stress, and fosters a secure parent-infant attachment within the sterile hospital environment, leading to better discharge readiness and improved post-hospitalization outcomes at home. Previous research demonstrates a clear link between infant massage and improved sleep outcomes (Field, 2019; Rahayu, 2019). However, limited case study implemented this complementary approach, particularly in Magelang city. Therefore, the case study is highly significant for paediatric and neonatal nurses because sleep disturbances in infants can severely disrupt neurodevelopment and compromise the overall well-being of the family unit. As frontline healthcare providers and primary sources of parental education, nurses are uniquely positioned to advocate for non-pharmacological, evidence-based interventions. Understanding the clinical efficacy of infant massage allows nurses to confidently teach parents a safe, cost-effective tool that stimulates the vagus nerve and regulates melatonin production. Ultimately, this empowers families to manage infant sleep issues at home, reduces parental stress, and promotes healthier infant-parent bonding, aligning perfectly with the core nursing philosophy of holistic, family-centered care.

Case Description

The subject of this case study was a single pediatric patient, Infant A, who was admitted to the Aster Ward at Muntilan Hospital presenting with a sleep pattern disorder. Data collection was carried out systematically through standard nursing process phases, beginning with obtaining informed consent from the parents. This was followed by a comprehensive nursing assessment, nursing diagnosis formulation, care planning, intervention implementation—specifically infant massage therapy—and clinical evaluation. To evaluate the intervention's efficacy, the Brief Infant Sleep Questionnaire (BISQ) was administered as the primary research instrument both before and after the therapy to measure shifts in the patient's sleep quality. During the initial assessment, the researcher utilized a three-pronged data collection approach: structured interviews, clinical observation, and medical record documentation. The baseline clinical assessment revealed that the patient was a 5-month-old female infant medically diagnosed with bronchopneumonia. According to the mother, the infant had been suffering from a fever since Saturday morning, December 21, 2024, which was accompanied by a persistent cough, shortness of breath, and an episode of vomiting productive of sputum. Although the infant was initially examined at a local community health center (Puskesmas), her condition failed to improve. Consequently, on Monday, December 23, 2024, the patient was brought to the Emergency Department of Muntilan Hospital for advanced medical and nursing intervention.

Upon admission to the ward, a subsequent assessment was conducted. The patient's mother reported that the infant was experiencing difficulty sleeping, frequent night time awakenings, irritability, and decreased activity, alongside a persistent cough and rhinorrhoea (runny nose). Objective clinical findings revealed a pulse rate of 136 beats per minute, a temperature of 36.8°C, a respiratory rate of 26 breaths per minute, and an SpO₂ of 98%. Physically, the infant appeared exhausted, lethargic, weak, and inactive, with visible difficulty settling into sleep. Nursing interventions targeting Infant A's nursing diagnosis of a sleep pattern disorder related to impaired sleep control were implemented over three consecutive days, from December 24 to December 26, 2024. The primary independent therapeutic action carried out by the author was daily infant massage therapy. A final evaluation conducted on December 27, 2024, at 08:00 AM revealed that the sleep pattern disorder was successfully resolved. The predetermined outcome criteria were fully met, as evidenced by a significant decrease in the infant's difficulty falling asleep, a reduction in frequent night time awakenings, and a resolution of non-restorative sleep patterns.

Discussion

Initial clinical assessment using the Brief Infant Sleep Questionnaire (BISQ) revealed several mild sleep disturbances across multiple parameters. Regarding night time sleep duration (7 PM – 7 AM), the infant presented with a mild issue, logging only seven hours of sleep. Similarly, daytime sleep duration (7 AM – 7 PM) was classified as a mild problem, with the infant sleeping for only two hours. The frequency of night time awakenings between 10 PM and 6 AM fell into the mild category, characterized by waking fewer than three times with the duration of each awakening lasting less than an hour. The infant's bedtime routine also showed mild irregularities, as she failed to go to sleep on time, with a variance of less than one hour compared to previous days. However, nocturnally, the infant struggled significantly to settle back to sleep, requiring more than two hours to fall asleep after waking up (Kang & Kim, 2021). These clinical

findings directly align with the established theoretical frameworks for infant sleep pattern disorders. Sleep disturbances in infants are typically identified by a night time sleep duration of less than nine hours, waking more than three times a night, and remaining awake for over an hour. During these periods, infants frequently exhibit irritability, prolonged crying, and difficulty falling back to sleep. This is supported by contemporary research, which asserts that difficulty falling asleep, frequent fussiness, disrupted daytime naps (Altena & Ellis, 2021), and overall poor sleep quality serve as definitive clinical manifestations of paediatric sleep pattern disorders. Based on these assessment data, the author established a focal nursing diagnosis: Sleep Pattern Disorder related to impaired sleep control, as evidenced by maternal reports of altered sleep patterns, difficulty falling asleep, frequent night time awakenings, decreased infant activity, exhaustion, lethargy, and persistent fussiness (D.0055). Ultimately, the infant experienced these physiological disruptions because her baseline sleep requirements were severely unmet, creating an acute deficit in her restorative rest cycle and culminating in a manifest sleep pattern disorder.

The diagnosis of sleep pattern disturbance was raised because the diagnosis was in accordance with the subjective and objective data obtained. The diagnosis is important to raise because infants are very susceptible to sleep pattern disorders. This sleeping pattern disorder in infants can continue until toddlerhood or school period, which is predicted to affect behaviour and emotions in children later, so there needs to be quick treatment to overcome sleeping pattern disorders. Sleep also has an important role in normal growth and development, emotional health and immune function, growth and recovery of body tissues, learning and memory processing, and repair of the central nervous system (Félix & Candeias, 2025; Alrousan et al., 2022; Bemanalizadeh et al., 2024). The preparation of nursing plans (interventions) and outcome criteria in infants refers to the Indonesian Nursing Outcome Standards (SLKI) and Indonesian Nursing Intervention Standards (SIKI) which are the basis for the nursing process. In the nursing diagnosis of sleep pattern disorders related to lack of sleep control characterized by the baby's mother saying the baby's sleep pattern changes, the baby has difficulty sleeping, the baby often wakes up and wakes up at night, the baby's activity decreases, the baby seems difficult to sleep, lacks rest, limp inactivity, and the baby is fussy (D.0055) with achievements quoted from the Indonesian Nursing Output Standards (SLKI), namely sleep patterns (L.05045) and Indonesian Nursing Intervention Standards (SIKI), namely sleep support (1.09265). The sleep pattern support intervention was chosen because it can perform infant massage therapy as well as observe the baby's sleep patterns that improve or not after infant massage therapy. Then the therapeutic intervention chosen to improve comfort is baby massage because baby massage was chosen because baby massage is useful for improving sleep patterns, stimulating motor nerves, helping digestion and increasing children's emotional calmness, in addition to nourishing the body and muscles. Babies who are massaged properly and regularly can grow healthier and develop better (Rakhmawati et al., 2024; Mrljak et al., 2022; Chen et al., 2024).

Massage stimulates the release of the endorphin hormone which decreases pain levels. This makes the baby feel calmer and the frequency of crying decreases. Massage also improves the quality and quantity of the baby's sleep. With massage there is also an increase in the release of serotonin levels which results in an increase in the quality of baby's sleep more optimally, serotonin has the content of the main transmitter substance that helps the formation of sleep by suppressing the activity of the activating system and other brain activities. The positive influence of touch on the process of child development has long been known to humans. The skin is an organ of the human body that serves as the widest receptor that humans have. Touch sensation is a sense that is actively functioning from an early age. Implementation carried out on the diagnosis of sleep pattern disorders related to lack of sleep control is characterized by the baby's mother saying the baby has difficulty sleeping, the baby often wakes up, the baby is fussy, the baby's activity decreases, the baby is still coughing, the baby looks difficult to sleep, weak, looks fussy, and restless (D.0055), namely with massage therapy intervention (I.08251) which is carried out for 3 days.

Implementation that has been carried out for 3 days shows a difference in the baby's response to the therapy given. The baby's response to the therapy given is getting better every day. Massage therapy given to the baby has a good effect on the baby. Infant massage given through gentle touches or strokes can provide a sense of relaxation and stimulate the nerves in infants. Baby massage will provide a sense of relaxation to the baby so that it can help the baby sleep better so that the baby can be introduced to a sleep rhythm that can help the baby get the benefits of regular and adequate sleep. So that it can overcome sleep pattern disorders in infants. The benefits of infant massage include biochemical effects that provide physical changes that change brain waves positively, improve blood circulation and breathing, increase growth with tactile stimulation, increase baby's concentration and make the baby fall asleep, build a bond of love between parents and children, increase milk production and touch or massage will stimulate blood circulation and increase energy. Babies whose muscles are stimulated by massage will be comfortable and sleepy. Most babies will sleep for a long time once the age massage is done. In addition to a long time, the baby appears to sleep soundly and is not as fussy as before, indicating that the baby feels calm after the massage. When the baby sleeps, when it wakes up, it will be fit so that it becomes a factor that supports the concentration and work of the baby's brain. Babies who get enough sleep without waking up are more fit and do not show that there is a difference in the quality of easy fussing the next day. Sleep has a profound effect on the body and the mental, emotional, physical and immune systems. The quality of a baby's sleep not only affects their physical development but also their emotional development.

Conclusion

This case study involved comprehensive nursing care for Infant A, a 5-month-old Javanese female residing in Magelang, who was admitted with a medical diagnosis of bronchopneumonia. Subjective assessment data provided by the mother revealed that the infant was experiencing difficulty falling asleep, frequent nighttime awakenings, irritability, decreased physical activity, a persistent cough, and rhinorrhea (a runny nose). Objective clinical findings supported these complaints, revealing a pulse rate of 136 beats per minute, a body temperature of 36.8°C, a respiratory rate of 26 breaths per minute, and an SpO₂ of 98%. Physically, the infant exhibited signs of exhaustion, lethargy, and weakness, appearing visibly unable to settle into a restful state. Based on this clinical data analysis, the nursing diagnosis of Sleep Pattern Disorder related to impaired sleep control (D.0055) was formally established. To address this issue, the author formulated a targeted nursing care plan derived from the Indonesian Nursing Interventions Standard (SIKI, 2018), specifically implementing the Sleep Support intervention package (I.09265), which centered on daily infant massage therapy. Following three days of continuous intervention, the final evaluation revealed significant clinical improvement: the infant's difficulty falling asleep decreased, the frequency of nighttime awakenings was minimized, and non-restorative sleep patterns were successfully resolved. Addressing sleep disturbances in hospitalized infants is of paramount clinical importance due to their high susceptibility to recurrent sleep fragmentation. Unresolved sleep pattern disorders in infancy can persist into toddlerhood and school-age years, ultimately manifesting as long-term behavioral and emotional challenges. Furthermore, physiological sleep is a cornerstone of healthy development; it is essential for normal physical growth, emotional regulation, robust immune function, tissue repair, memory consolidation, and the ongoing maturation of the central nervous system.

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