



The Effectiveness of Baby Massage on Sleep Duration for Infants Aged 1-12 Months

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Abstract: This scoping review aims to review the effectiveness of baby massage on sleep duration of infants aged 1-12 months. The criteria included in this review were articles in Indonesian or English with publications in the last 10 years, articles focused on infant massage and increasing sleep duration for infants aged 1-12 months. In Indonesia, some babies experience sleep problems, namely around 44.2% where almost all parents do not consider the disturbance experienced by babies as a problem with a total of 285 babies, data obtained from 51.3% of babies have sleep disturbances, 42.2% of babies sleep less than 9 hours a night, and at night the baby wakes up more than 3 times by waking up more than an hour. The structure for writing this scoping review uses the PRISMA-ScR Checklist with 5 stages according to Arksey and O'Malley. An article search was conducted on December 23, 2022 using several databases including PubMed, Wiley Online library, National Library and science direct. Of the 422 articles obtained, there were 64 potentially relevant articles, ten of which met the inclusion criteria. presented with three themes of baby sleep quality, baby development, infantile colic. Conclusion: from several articles obtained during the search, it was found that baby massage can improve the quality and duration of baby sleep. In addition, baby massage is also one of the colic treatments experienced by babies.

Keywords: Baby massage; scoping review; sleep duration; sleep quantity

Introduction

Sleep disturbance is a problem faced by parents. As many as 33% of babies experience sleep disturbances. This illustrates the many sleep disturbances experienced by babies and these activities can persist or be repeated where this incident has been reported by postpartum mothers related to sleep problems experienced by babies (Khadka et al., 2020). WHO (World Health Organization) notes that more than 200 million children aged five years in the world do not fulfill their developmental potential and that is in the continents of Asia and Africa. The incidence of developmental delays in the United States ranges from 12-16%, Thailand 24% and Argentina 22%, while in Indonesia 13-18% (Chen et al., 2020). The high incidence of growth and development by UNICEF in 2015 stated that (27.5%) or 3 million children experienced this disorder. Supported

by the National data statement which stated that in 2014 there were 13% -18% of children under five experiencing growth disorders in Indonesia (Rivadeneira et al., 2020). The NICHD Early Child Care Research also states that in America, in infants aged 6-15 months, 53% of infants aged 6 months experience sleep problems, while 44% of infants aged 15 months (Akamatsu et al., 1975).

In Indonesia, some babies experience sleep problems, namely around 44.2% where almost all parents do not consider the disturbance experienced by babies as a problem with a total of 285 babies, data obtained from 51.3% of babies have sleep disturbances, 42.2% of babies sleep less than 9 hours a night, and at night the baby wakes up more than 3 times by waking up more than an hour. Despite the fact that it is considered a problem and the mother only considers it a small problem. In fact, sleep problems can interfere with the growth and development of the baby, cause immune

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function to be vulnerable, and disrupt the regulation of the endocrine system (Childs et al., 2019). Babies who sleep longer make the baby's growth and development reach optimal levels and this allows the body to renew and repair all body cells because the baby's brain growth reaches its peak when the baby is deep asleep (Sukmawati & Nur Imanah, 2020). Government support in the Regulation of the Minister of Health of the Republic of Indonesia Number 66 of 2014 contains monitoring of growth, development, and disorders of child growth and development which is a reference for health workers who work in basic health service facilities, professional groups, educators, family planning field workers, social workers related to fostering child development, professional organizations and stakeholders related to growth, development, and disorders of child growth and development (Fallah Shayan et al., 2022).

Health workers play a role in carrying out promotive-preventive efforts related to the benefits of massage for babies, namely increasing body weight and growth, increasing endurance, making babies relax, comfortable and making sleep soundly. In line with the above, it is necessary to carry out baduta massage in health care facilities, according to Minister of Health Regulation Number 37 of 2 2017 concerning Traditional Integration Health Services. For this reason, it is necessary to increase the capacity of health workers, namely midwives in baduta massage services.

Study (Castejón-Castejón et al., 2022) explained that children who cry protractedly, perform worse on many tests of cognitive development. Over the years, many studies have attempted to provide answers to infants with infantile colic and their families from different therapeutic perspectives. On the one hand, there are options such as drug administration, acupuncture diet and manual therapy treatments, such as foot reflexology, physiotherapy and visceral osteopathy, massage, spinal manipulation, and craniosacral therapy where all of these therapies include massage therapy performed on infants. Baby massage can also effectively increase bonding attachment and sleep duration, besides that it can also reduce the frequency and length of time the baby wakes up during the sleep phase (Kuroda et al., 2021).

The purpose of the Scoping Review is to explore the latest scientific evidence regarding the effectiveness of baby massage on sleep duration for infants aged 1-12 months. The included articles provide quantitative and qualitative evidence about the effectiveness of baby massage on sleep duration for infants aged 1-12 months. The articles included in this study included articles written by several health professionals such as doctors, nurses, midwives and other health-based researchers.

Method

The method used in this literature study is scoping review. Scoping review is a design to review the scope of the methodology that allows the assessment of scientific evidence and this is the first step that can be taken before starting a research (Munn et al., 2018). The PRISMA-ScR checklist is used as a guide in preparing this scoping review as a method to improve quality assurance of the completeness of the structure and process of the scoping review. (Page et al., 2021) PRISMA-ScR was chosen by researchers as a reference for compiling a literature study because it has a complete and detailed drafting checklist. PRISMA-ScR is an extension for scoping reviews checklist which has 22 assessment items with 20 important reporting items and 2 optional items in preparing scoping reviews. In this chapter the PRISMA-ScR guide checklist is used directly on the methodology in item five.

Result and Discussion

Result

The articles used in compiling the scoping review are accompanied by titles, author names, countries, objectives, research methods, data collections, participants and results. Articles are numbered A1-A10 to make it easier to find articles. All articles are searched for major themes, including the quality of baby sleep, infant development and infantile colic. Based on the critical appraisal that the author did, there were 2 [A2, A3] articles with the best ratings out of 3 randomized controlled trial articles. There are 4 Quasi-Experimental Articles which have a sufficient rating of B [A10]. 2 Qualitative articles have 1 best rating [A6] and Quantitative Cross-Sectional articles [A9] get less (C). From the mapping of the 10 articles obtained in this review, 8 of the total articles were included on the Asian Continent and 2 articles from the European Continent. A total of 5 articles used Quasi-Experimental, 3 articles used Randomized Controlled Trials, and 2 articles used Quantitative Cross-Sectional.

Article Evaluation Results

Based on the articles assessed using the JBI instrument, the results were 5 articles with good scores (A2, A3, A6, A7, A10), one article with sufficient scores (A1) and 4 articles with poor scores (A4, A5, A8, A9), with the highest score being 9.7 (A) included in the good category in article A6, for the lowest score being 4.7 (C) in article A4. The advantages of article A6 apart from the points that must be answered from the appraisal article and are well structured in terms of article writing, this article states that research is not based on the duration

or length of time in giving massages but on repetition in each massage movement where in each massage movement the movement can be repeated 4 to 6 times while continuing to observe the baby's response when doing massage. Another detail explained in this study is that almost all of the research discussion paragraphs refer to scientific explanations that contain physiological anatomy related to baby massage, this is of added value to the author compared to other articles. The article that has the lowest score in this study is A4. The drawbacks of this article are that the writing is not well structured, it does not include the objectives of the research itself, there is no explanation regarding the inclusion and exclusion criteria of the respondents to be studied and the tools, results and method of measuring the research are not clear. In addition, researchers also did not explain to reduce research bias.

Theme Analysis

In this review, the articles described are classified into 3 main themes, namely: Quality of baby sleep, baby development and infantile colic. In theme 1, the quality of baby sleep is explained in detail about the difference in sleep duration for babies who are given baby massage intervention and those who are not given the intervention in the article [A4, A5, A8, A10]. On theme 2, namely baby development, massage gently stimulates newborn skin receptors, bringing a sense of security and comfort to newborns. Stimulation, with postural changes, facilitates the release of intestinal gas and newborn secretions, is beneficial for postural drainage and lung development, changes in the baby's brain waves, increases the hormone serotonin and endorphins hormones [A4, A6, A8, A10]. In the last article, namely theme 3 about infantile colic. It was found that baby massage can reduce the symptoms of infantile colic, namely in the article [A1, A2, A3, A7].

Theme 1: Quality of baby sleep

Most of the respondents experienced severe stress, both in the treatment and control groups because the baby experienced a decrease in the level of health and trauma response after the initial admission to the hospital. As a result, almost all respondents experienced poor sleep quality. After being given the baby massage intervention, almost all babies had low stress levels and good sleep quality (Rezaei et al., 2023).

Babies who were given the baby massage intervention increased the duration of their sleep after being given massage, as many as 36 babies (85.71%) increased compared to before the intervention, namely 7 babies (16.67), which means that there was a significant effect of baby massage on increasing the baby's sleep duration. Baby massage has a significant or moderate

relationship to the quality of baby's sleep. Of the 50% of mothers who massaged their babies, 47.22% of the babies slept soundly and 2.78% of the babies did not sleep well, and from the 50% or group of mothers who did not massage their babies, 5.56% of the babies slept soundly and 44.44% of the babies did not sleep soundly (Pebrianthy et al., 2023). This shows that babies who get a massage from their mother will be able to sleep soundly because the baby's muscles get a stimulus from massage with light pressure or strokes from their mother.

Given the importance of sufficient sleep time for the growth and development of the baby, the need for sleep must really be met so that it does not have a negative impact on its development. Based on the results of the study, after being given a baby massage, the lowest sleep duration was 12.0 hours, the maximum sleep duration was 16.0 hours, and the average length of sleep was 14.20 with a difference in average sleep length of 1.267 hours. Babies with poor sleep times will have a negative impact on their development such as decreased body immunity, babies are easily emotional, and decreased concentration (Garbarino et al., 2021).

Theme 2 : Infant Development

Infant development is the result of the interaction of various factors, both internal (genetic) and external (environmental) factors. Babies need stimulation to be able to grow and develop optimally and create a sense of comfort and confidence so that babies are more responsive to their environment and more developed. Lack of tactile stimulation can lead to social, emotional and motor behavioral deviations (Yates et al., 2014).

One of the treatments or therapies that support baby development is baby massage. Effect of baby massage on sleep quality and increased gross motor development in infants At the age of 1-3 months there is an increase in the level of activity in the neurotransmitter serotonin which is produced after massage so that there is a decrease in the hormone adrenaline. Baby massage will also stimulate the release of endorphins which cause the baby to relax and calm down (Agustina et al., 2022). Other studies also state that baby massage interventions, which are a baby's need, provide benefits for improving blood circulation, digestive tract, training to strengthen muscles, making babies comfortable so that baby's development becomes optimal.

The results of research from (Makar et al., 1975) after baby massage were carried out from 25 babies there were 15 babies who experienced an increase in growth and development and 10 babies who did not experience an increase, because the stimulation through skin touching massage on good babies will stimulate the nerves of the brain to control motor activity so that it can

improve gross motor development. Massage for babies will also speed up blood circulation so that more fresh oxygen will be sent to the brain and throughout the body which results in a balance between the limbs and the brain which helps accelerate motor development in babies (Hadders-Algra, 2018).

In addition, baby massage also increases the production of absorption enzymes, increases the neurotransmitter serotonin, and increases immunity and causes changes in brain waves which cause babies to become weak, sleep more soundly. Thus baby massage is very influential on the growth and development of the baby [19]. Massage therapy is also safer than acupuncture therapy and umbilical compresses. Massage can help accelerate the formation of gastrointestinal function in newborns (Dehghan et al., 2017). The awareness-raising findings can be explained by recent evidence that massage therapy increases electrical activity and brain maturation in babies born prematurely, thereby providing stimulation.

Theme 3: Infantile Colic

According to the Gastrohepatology Coordinating Work Unit of the Indonesian Pediatrician Association (UKK IDAI) Infantile colic or commonly called colic is one of the prevalences of functional digestive disorders that is quite large in infants less than 12 months old. Functional gastrointestinal disorders are symptoms of both chronic and gastrointestinal disorders recurrences that cannot be explained structurally or biochemically (Rosalia & Hidajat, 2022).

Professionals apply craniosacral therapy (scalp and neck massage) based on clinical judgment, with a focus on light touch manual therapy. The number of CST sessions needed to treat symptoms of infantile colic in the experimental group was 3 sessions for 10 babies (34.4%), 2 sessions for 17 babies (58.6%) and 1 session for 2 babies (5.8%). this study showed that the group that received a different number of CST sessions experienced a significant improvement at day 24 in the severity of crying, sleep and colic compared to the group that did not receive any treatment.

The effect of massage therapy on the speed and duration of colic cries showed that the average cry severity decreased from 5.13 to 2.71 during the one-week intervention. This study also shows that massage therapy helps babies to sleep better. Average sleep duration increased by about 2.9 hours per day for babies who got massages one week. The number of colic cries in the massage group decreased from 8.34/day to 4.26/day at the end of the study.

Average change in colic symptoms during the study. As can be seen, the amount and duration of crying in the massage group decreased more than in the

rocking group. The duration of crying in the massage group experienced a significant reduction, from about 5 hours at the start to more than 1 hour on the last day of the study, whereas in the rocking group this time was reduced by about one hour.

Discussion

The purpose of this scoping is to determine the effectiveness of baby massage on the sleep duration of infants aged 1-12 months. The articles in this research scoping review provide quantitative evidence regarding the effect of baby massage on the quality and duration of sleep for both healthy and medically history-bound infants. Infants who are massaged can increase the production of absorption enzymes, increase the neurotransmitter serotonin and increase the body's immunity and cause changes in brain waves that cause babies to sleep more soundly. That's why the baby's sleep pattern will be better after getting a massage.

The increase in the quantity of sleep in babies who are given massage is caused by an increase in the secretion of serotonin levels produced during massage. Serotonin is the main transmitter substance that accompanies the formation of sleep. At the time of the massage also secretes Melatonin which has a role in sleep and makes you sleep longer and deeper at night, because more melatonin is produced in the dark when the light entering the eye is reduced (Ostrin, 2019).

Babies whose muscles are stimulated by massage or massage will be comfortable and sleepy (Mier & van den Hurk, 1975). Most babies will sleep for a long time once the massage is done on them. Apart from that, the baby seems to be sleeping soundly and is not as fussy as before. This shows that the baby feels calm after the massage. Mother always feels happy when she sees her baby sleeping soundly.

Baby massage is a slow and gentle stroking movement all over the baby's body starting from the feet, stomach, chest, face, hands and back of the baby. Massage baby is a form of touch stimulation. Tactile stimulation is the most important in development. The sensation of touch is the most developed sensory at birth. Baby massage is very influential in increasing the baby's sleep duration, this shows that baby massage can increase the production of absorption enzymes, increase the neurotransmitter serotonin, and increase immunity and cause changes in brain waves that cause babies to become weak, sleep more soundly. That's why the baby's sleep pattern will be better after a massage.

Baby massage also helps babies feel calmer because baby massage movements can help reduce the level of the hormone cortisol which is known as the stress hormone in the body, and encourage the production of hormones that make babies feel comfortable. The feeling

of comfort that is felt when given a massage by parents will stimulate the hypothalamus to produce serotonin and oxytocin. Serotonin (5-HT) and oxytocin (OXT) are two neuromodulators involved in human behavior and socialization as well as in conditions when experiencing stress, depression and autism (Rifani & Sofiyanti, 2022).

Baby massage done early on, the baby will get many benefits. Massage is done regularly every day until the baby is 6-7 months old to get more optimal results. Endurance or body immunity can be increased by giving baby massage because it can improve blood circulation and breathing, stimulate digestive and excretion system functions, increase body weight, reduce stress and tension, increase alertness, sleep the baby more soundly, reduce pain, bloating and colic pain, increase the inner relationship between parents and babies, increase production Breastfeeding helps parents know non-verbal or verbal sign language in babies, and makes them confident in caring for babies.

The sleep quality of infants aged 1-6 months before the baby massage stimulation was carried out, most of the respondents had poor sleep quality, namely 11 (31.4%) decreased to 2 respondents (5.7%) and after infant massage, the sleep quality of infants aged 1-6 months increased where most of the respondents had good sleep quality, namely from 3 respondents (8.6%) to 20 respondents (57.2%). Baby massage done by the mother to her baby increases the deeper attachment between mother and baby. The mother becomes more understanding of the baby's condition and through this baby massage experience it also makes the mother calmer and reduces the stress experienced by both mother and baby. In the process of massaging the baby, the mother learns about her baby's own cues about her needs, and learns to respond appropriately to those needs (Pratiwi, 2021).

Baby relaxation and better sleep are felt by first and second mothers as part of a positive experience with babies in doing massage with their babies (Vicente et al., 2017). As a mother, so that the baby is relaxed and sleep patterns improve. Positive experiences complement the existing evidence base that may influence future practice with the potential for inclusion of infant massage programs as part of maternal and child care services (McCarty et al., 2023). It can play a meaningful supporting role for the well-being of mothers and their babies (Phuma-Ngaiyaye & Welcome Kalembo, 2016).

Several factors can cause babies to experience sleep disturbances (Marakovitz et al., 2023). One of them is when the baby has colic. Infantile colic is one of the most common disorders in newborns (Hjern et al., 2020). It affects 20-40% of babies between birth and 6 months to 1 year of age, although in some cases, it tends to resolve spontaneously around 4 months of age. Infantile colic

can affect a family's health, as parents' anxiety increases when they cannot find a solution to soothe their baby. Among colic symptoms, the number of cries has an average baseline that is statistically the same in both groups. The mean duration of crying was 4.96 hours in the massage group and 3 hours in the rocking group. In this study the results obtained revealed that all symptoms improved significantly in the massage group during the intervention, while only the severity of colic improved in the rocking group.

Conclusion

Based on 10 articles, the results show that baby massage can increase the duration and quality of baby sleep. Evidenced by the baby massage intervention that has been carried out, this has a positive influence as well as new experiences and learning for mothers in understanding their baby's condition.

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Author Contributions

Conceptualization, N. A. D. S and I.; methodology, N. A. D. S.; validation, I., and N. A. D. S.; formal analysis, I.; investigation, N. A. D. S and I.; resources, N. A. D. S and I.; data curation, I; writing—original draft preparation, N. A. D. S and I.; writing—review and editing, N. A. D. S.; visualization, N. A. D. S. and I.; supervision, N. A. D. S.; project administration, N. A. D. S.; funding acquisition, I. and N. A. D. S. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

No Conflicts of interest.

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