

## THE EFFECTIVENESS OF BABY MASSAGE ON PHYSICAL, MENTAL, AND MOTOR DEVELOPMENT, AS WELL AS MOTHER-BABY INTERACTION

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### ABSTRACT

The growth and development period of a baby is a golden period as well as a critical period of a person's development, namely at the age of 0-12 months. It is called the golden period because the baby period is very short and cannot be repeated. It is called a critical period because at this time the baby is very sensitive to the environment and needs good nutritional intake and stimulation for its growth and development. The purpose of this study was to determine the effectiveness of baby massage on the growth and development of babies. This research method uses a Systematic Literature Review. Article searches using the Google Scholar, PubMed, ProQuest, GARUDA databases from 2019-2024 and the selection process using the PRISMA diagram. Inclusion criteria in the study included research articles from 2019-2024 that discussed the effectiveness of baby massage on the growth and development of babies, involving participants aged 0-12 months, and available in English or Indonesian. Exclusion criteria included articles that were not relevant to baby massage, lack of sufficient information, inappropriate language, focus on other baby massages, and irrelevant samples. The results of the study obtained five articles that showed that baby massage had a significant effect on the growth and development of babies. From the 3 articles, baby massage can improve the growth and development of babies. The frequency of baby massage is done 2 times 15 minutes every week for a period of 4 weeks. The conclusion of this study is that baby massage has an effect on improving the growth and development of babies. Baby massage can improve the growth and development of babies if done according to the frequency of baby massage is done 2 times 15 minutes every week for a period of 4 weeks. Based on the results of this study, it is recommended to provide baby massage intervention with the right frequency of administration and in babies aged 0-12 months can be an effective alternative in improving the growth and development of babies

**Keywords:** Baby Massage, Infant Physical Growth, Infant Motor Development, Infant Mental Development, Mother-Infant Interaction

### INTRODUCTION

The infant stage is a phase of rapid growth and development, beginning from birth until one year of age. The developmental stages of infants are divided into two categories: neonates, from birth to 28 days, and infants, from 29 days to 12 months (Sembiring, 2019). An infant is defined as a child aged 0 to 12 months (Afrida & Aryani, 2022). The most easily observed aspect of a baby's development for parents is movement or motor skills. In general, body movements are classified into two types: gross motor skills and fine motor skills. Gross motor skills involve movements that use large muscles, such as kicking, grasping, sitting, standing, and running (Merida & Hanifa, 2021). The growth and development of infants are divided into four stages: ages 0–3 months, 4–6 months, 7–9 months, and 10–12 months. At 4–6 months, motor development in infants advances most rapidly (Khalifatunnisak et al., 2022).

Various therapies, both pharmacological and non-pharmacological, have been developed today. Baby massage is one form of non-pharmacological therapy aimed at improving sleep quality in infants (Sartika et al., 2023). Baby massage involves gentle, slow movements, starting with the legs, stomach, chest, face, hands, and back. It is a form of tactile stimulation that plays a crucial role in development (Budiarti & Yunadi, 2020). Baby massage is a therapy that uses direct body contact to help the infant feel safe and comfortable. A mother's hug and touch are essential needs for a baby. Regular baby massage increases the levels of catecholamine hormones (epinephrine and norepinephrine), which stimulate growth and development by enhancing appetite, weight gain, and brain structure and function (Doska, 2019).

The primary mechanism behind the benefits of baby massage is the activation of the vagus nerve, which impacts food absorption, increases breast milk volume, boosts serotonin production, improves immunity, and positively affects brain wave patterns. Beta-endorphins influence growth mechanisms (Juwita & Jayanti, 2019). A parent's touch, combining affection, voice, eye contact, and movement, helps babies and parents communicate with each other. During massage, close family members, such as fathers, grandmothers, and grandfathers, can become more emotionally involved. An infant instinctively senses and responds to their mother's touch as an expression of love, security, and attention (Setiawandari, 2019).

## RESEARCH METHODOLOGY

The data collection method used is a literature review. This study uses secondary data, which is obtained from previous research conducted by other researchers. Literature searches were conducted from October 2019 to October 2024. This study is a literature review, a systematic review following the steps outlined by O'Brien and McGuckin (2016). These steps include pre-review considerations, such as investigating whether similar reviews have been conducted, assessing the methodological quality of the documents selected for review, and identifying and minimizing bias. The search method comprises nine steps: defining textual terms, identifying synonyms, managing spelling and segmentation, identifying relevant databases, testing searches, setting broad or narrow keywords, checking spelling, combining logical searches, and adjusting specific database search syntax.

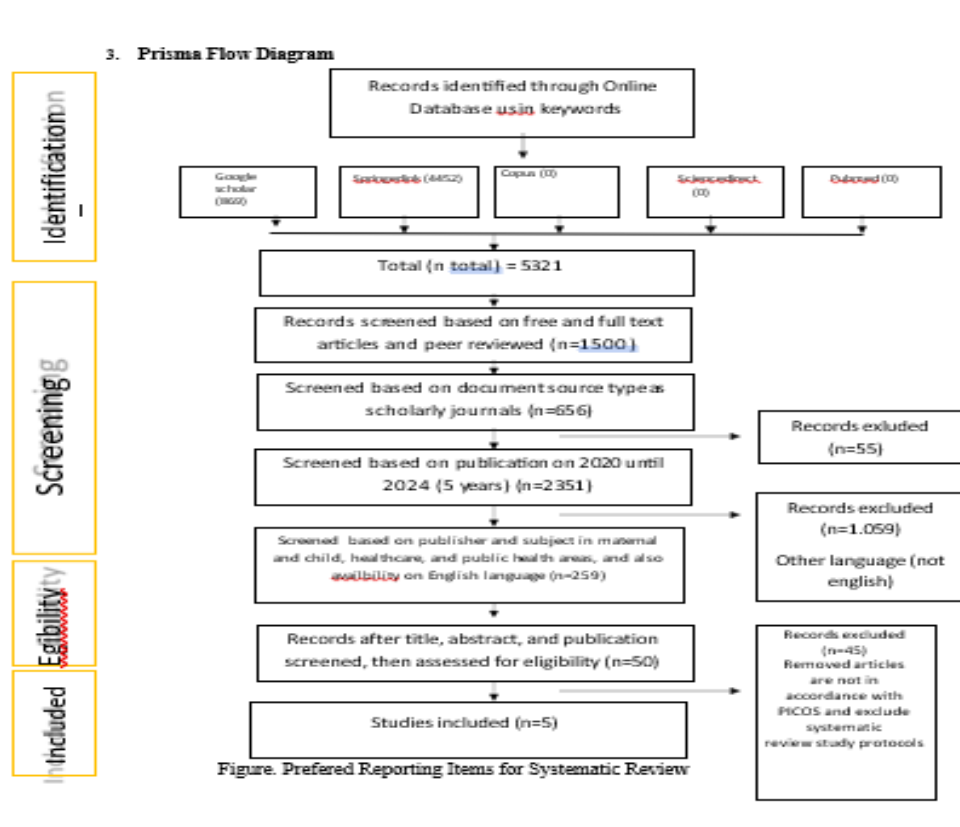
The review process involves 10 steps, including developing inclusion and exclusion criteria, systematic searches across various databases, importing search results into a single bibliography, documenting searches, organizing duplicates by hierarchical relevance, obtaining search results, seeking other relevant articles (including policies and books via alternative searches), systematically assessing relevant articles, validating findings, and summarizing conclusions. Inclusion criteria include research articles from 2019–2024 discussing the effectiveness of baby massage on physical, mental, and motor development, mother-infant interaction, involving mothers with infants aged 0–6 months, and available in English or Indonesian. Exclusion criteria include articles unrelated to baby massage intervention, lacking sufficient information, inappropriate language, focusing on unrelated baby massage types, and irrelevant sample groups.

The secondary data sources are journal articles, both national and international. The literature review search uses databases such as Google Scholar (<https://scholar.google.com>), PubMed (<https://pubmed.ncbi.nlm.nih.gov>), ProQuest (<https://www.proquest.com>), and GARUDA (Garba Rujukan Digital) (<https://garuda.kemdikbud.go.id>). The researcher used several keywords to obtain research articles relevant to the research title or theme. Keywords used include baby massage, growth, development, physical, mental, motoric, and mother-child interaction. The data analysis technique for this study is contrast identification, a review method that identifies differences across various studies to draw conclusions. This involves comparing

the effectiveness of baby massage on physical, mental, motoric development, and mother-child interaction. Data processing in this study includes editing and entry. Editing involves reviewing the researched literature, and entry is the process of inputting data from the literature into computer software using Ms. Word.

**Table of Journals Based on PICO Then Filtered by Full Text**

No	Journal Source	Initial Count	Duplicates	Not According to PICO	Exclude Systematic Review/Study Protocol	Remaining Journals	Full Text	Selected References
1	Google Scholar	869	150	570	0	98	46	5
2	Springerlink	4452	250	3700	8	11	4	0
3	Scopus	0	0	0	0	0	0	0
4	Sciencedirect	0	0	0	0	0	0	0
5	Pubmed	0	0	0	0	0	0	0
TOTAL		5321	400	4270	8	109	50	5



## RESULT

The population under study includes mothers with infants aged 0-6 months, focusing on the intervention of baby massage and its outcomes. The comparison group includes mothers with infants of the same age who do not receive baby massage. For infants, the outcomes measured are weight, height, fussiness level, and motor activity. For mothers, outcomes include

responsiveness, initiation of interaction, quality of affection, stimulation, communication, and physical contact. The study design is quantitative and experimental.

For article selection, a set of criteria was established using a checklist for assessing study quality based on the CEBM appraisal method. Each article was reviewed according to specific criteria, such as research focus, study design, subject selection, sample representativeness, statistical power, response rate, validity and reliability of measurements, statistical significance, confidence intervals, potential confounders, and applicability of results. All five articles scored 12, indicating high quality and relevance to the research objectives.

No .	Author(s) / Year	Article	Location	Research Methods	Sampling	N Sumb er of Sampl es	Data Source	Quality Assessm ent (0-12 points)
1	(Wardayani, 2023)	Melatih Meningkatkan Kebugaran Bayi Dengan Melakukan Senam Bayi Di Kelurahan Lembah Lubuk Manik	Indonesia	Experimental	Convenience sampling	35	Survey	12 (High Quality)
2	(Muliasari et al., 2024)	Pengaruh Baby Massage dan Gym Terhadap Perkembangan Motorik Bayi Usia 3-6 Bulan	Indonesia	Experimental	Random sampling	50	Questionnaire	12 (High Quality)
3	(Herlina et al., 2023)	Pengaruh Baby Massage Terhadap Perkembangan Bayi	Indonesia	Cross-sectional study	Random sampling	50	Questionnaire	12 (High Quality)
4	(Henry, 2024)	Pelatihan Dan Edukasi Manfaat Baby Spa Untuk Pertumbuh	Indonesia	Cross-sectional study	Simple random sampling	40	Observation	12 (High Quality)

No .	Author(s) / Year	Article	Location	Research Methods	Sampling	N Sumb er of Sampl es	Data Source	Quality Assessm ent (0-12 points)
		an Dan Perkembangan Bayi Bagi Ibu- Ibu Di Desa Lingga Kecamatan Simpang Empat Kabupaten Karo						
5	(Retnaningsih & Purwanti, 2023)	Pengaruh Baby Massage dan Gym Terhadap Perkembangan Motorik Bayi Usia 3-6 Bulan	Indonesia	Cross-sectional study	Purposive sampling	30	Questionnaire	12 (High Quality)

The systematic literature review (SLR) on the effectiveness of baby massage draws insights from five high-quality studies conducted in Indonesia. Each study, scoring the maximum on quality assessment, explores the impact of baby massage and similar interventions on infant development, utilizing a range of sampling methods and quantitative approaches.

The findings across these studies indicate that baby massage has a significant positive effect on multiple aspects of infant development. Physically, baby massage enhances infant fitness, as highlighted by Wardayani (2023), and supports overall growth and height gains. Motor skill development is also positively impacted, as observed in the studies by Muliasari et al. (2024) and Retnaningsih & Purwanti (2023), demonstrating that regular massage sessions contribute to improved motor skills, coordination, and movement in infants aged 3-6 months. Furthermore, mental and emotional benefits include reductions in fussiness and anxiety, contributing to a calmer temperament in infants. The studies by Henry (2024) and Herlina et al. (2023) emphasize that baby massage promotes mental well-being and aids in the development of the infant's temperament and emotional stability.

Mother-infant interaction is another area positively influenced by baby massage. Across the studies, researchers noted improvements in motherly responsiveness, emotional bonding, and physical contact, as massage fosters intimate interaction and communication. This interaction enhances mothers' affection quality, stimulation efforts, and overall attentiveness to their infants' needs, ultimately benefiting both mother and child. Overall, the studies validate that baby massage is an effective intervention for holistic infant development and enhanced mother-child

interaction, providing a foundation for its continued use and recommendation in early childhood care.

## DISCUSSION

The findings from the SLR indicate that baby massage is an effective intervention with multifaceted benefits for both infants and mothers. Specifically, baby massage contributes positively to physical, motor, and emotional development in infants aged 0-6 months. Studies such as those by Wardayani (2023) and Muliasari et al. (2024) emphasize improvements in physical fitness and motor skills, which may be due to the gentle physical manipulation involved in baby massage, stimulating muscle development, blood circulation, and overall physical engagement in infants. These findings support existing research that posits touch-based interventions as effective methods for promoting physical growth and reducing developmental delays, particularly in early infancy when neural and muscular development is highly receptive to external stimuli.

Mental development and reduced fussiness are additional benefits identified in this review, with researchers like Henry (2024) and Herlina et al. (2023) noting that baby massage may help lower stress levels in infants. This reduction in fussiness and increased mental calmness could be attributed to the release of hormones such as oxytocin and serotonin, which are known to have calming effects. Given that infant distress can impact sleep patterns and overall well-being, the potential for baby massage to alleviate fussiness and promote better sleep is significant for both infants and their caregivers. The improved mental state and decreased irritability in infants align with earlier studies on massage's effects on cortisol reduction, highlighting its broader mental health benefits for infants.

Moreover, the studies in this review highlight improvements in mother-infant bonding, responsiveness, and interaction quality following regular baby massage. The increased skin-to-skin and eye contact involved in massage sessions encourage maternal attentiveness, while also enabling mothers to become more attuned to their infants' non-verbal cues. This enhancement in mother-infant interaction not only benefits the infant's socio-emotional growth but also promotes maternal confidence and bonding. The findings align with attachment theory, which suggests that early physical and emotional interactions are crucial for building secure attachments and trust between mother and infant.

Although the studies offer compelling support for the efficacy of baby massage, some limitations need to be acknowledged. The research designs primarily involve convenience and purposive sampling, which could affect the generalizability of the results across broader populations. Additionally, cultural factors unique to Indonesia may influence both maternal perceptions and the outcomes of baby massage, suggesting the need for further cross-cultural studies. Lastly, while all studies scored highly in quality assessments, potential biases in reporting positive outcomes were not fully accounted for, necessitating future research that incorporates control groups and longitudinal tracking to confirm lasting effects.

## CONCLUSION

In conclusion, the SLR strongly supports baby massage as a beneficial practice for infant physical, motor, and mental development, as well as for enhancing mother-infant bonds. Given its low-cost and non-invasive nature, baby massage holds promise as a widely accessible tool to promote holistic infant development and family well-being. Further research involving diverse populations and longitudinal methodologies would enhance the validity and application of these findings.

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## Conflict of Interest

The authors declare that they have no competing interests.

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