

INFORMASI ARTIKEL

Received: February, 04 2026

Revised: February, 11, 2026

Available online: February, 20, 2026

at : <https://e-jurnal.iphorr.com/index.php/mchc>

The effectiveness of complementary baby massage therapy on weight gain in stunting toddlers

Dessy Ratna Sari*, Deby Chyntia Yun, Henny Rista, Eva Donna, Sri Rezeki

Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: dessyratnasari@mitrahusada.ac.id

Abstract

Background: Stunting remains a chronic nutritional problem in Indonesia, impacting the growth and development of infants. Low appetite and inadequate food intake are major contributing factors to stunting. One non-pharmacological intervention with the potential to improve appetite and digestive function is infant massage, which is considered safe, easy to implement, and sustainable in the community.

Purpose: To analyze the effect of infant massage on eating patterns and weight gain in stunted toddlers.

Method: This study used a quasi-experimental design, dividing respondents into an intervention group and a control group. The intervention group received structured infant massage six times over two weeks, followed by one-month follow-up. Data collection included an appetite assessment questionnaire and anthropometric measurements to assess changes in toddler weight.

Results: The study results showed that stunted toddlers who received regular infant massage for two weeks experienced significant increases in appetite and weight gain after a one-month follow-up period compared to the control group. Infant massage has been shown to be effective in stimulating appetite and supporting weight gain in stunted toddlers.

Conclusion: Infant massage can be used as an effective complementary intervention in stunting management programs, particularly in improving dietary patterns and increasing the nutritional status of stunted toddlers.

Keywords: Baby Massage; Complementary Therapy; Stunting; Toddler; Weight.

INTRODUCTION

Stunting is a nutritional problem that remains a major challenge to health development in Indonesia. Stunting is defined as a condition of growth failure in toddlers due to chronic malnutrition, particularly in the first 1.000 days of life, resulting in a child's height falling below the World Health Organization (WHO) growth standards. This condition not only impacts physical growth but also affects cognitive development, intelligence, and long-term productivity (World Health Organization, 2021).

Infant massage is a structured touch therapy that involves gentle manipulation of the baby's soft tissues using specific techniques. Various studies have shown that infant massage has physiological and psychological benefits, including increased blood

circulation, stimulation of the parasympathetic nervous system, increased growth hormone production, improved digestive function, and reduced levels of the stress hormone cortisol (Duarba, Mediastari, & Wiryathatha, 2023).

The mechanism by which infant massage improves toddler eating and growth is multifactorial. Mechanical stimulation of the abdominal wall can increase gastrointestinal motility, thereby improving digestion and nutrient absorption. Furthermore, massage stimulates the vagus nerve, which plays a role in regulating appetite and digestive function. Massage also reduces levels of the stress hormone cortisol and increases growth hormone, both of which contribute to weight gain and appetite. Furthermore,

The effectiveness of complementary baby massage therapy on weight gain in stunting toddlers

massage strengthens the bond between mother and child, creating an emotional environment more conducive to eating (Azizah, Sembiring, Sembiring, Asnika, Sinaga, & Purnamasari, 2021).

However, research specifically examining the effects of infant massage on improving eating patterns and weight gain in stunted toddlers is still limited, particularly in Indonesia. Most previous studies have focused on premature or low-birth-weight infants, while stunted toddlers have distinct characteristics and challenges. Stunted toddlers have generally passed the critical period of the first 1.000 days of life and require interventions capable of breaking the long-standing cycle of malnutrition (Emmaria, Sinaga, Manurung, Tobing, Lubis, & Sihombing, 2024).

Furthermore, although infant massage is a common traditional practice in Indonesia, its implementation as a structured and measurable health intervention is still rare. Many mothers perform traditional infant massage without adequate understanding of correct technique, optimal duration, and effective frequency. Therefore, research is needed that can provide scientific evidence regarding effective infant massage protocols, specifically for stunted toddlers (Pangaribuan, Said, Rahim, Hassan, & Poddar, 2023).

The urgency of this research is based on the high prevalence of stunting in Indonesia, the high level of appetite problems in stunted toddlers, the limited non-pharmacological interventions that families can implement at home, and the limited scientific evidence regarding the effectiveness of infant massage in the stunted toddler population. This study used a quasi-experimental design with a control group to objectively compare the effects of infant massage in the intervention group and the no-intervention group (UNICEF, 2022).

The structured infant massage protocol, with a two-week intervention duration and a frequency of six massages, was chosen based on literature showing that massage interventions require adequate duration and frequency to produce significant physiological effects. The results of this study are expected to contribute to the development of complementary interventions for stunting management that can be applied at the community level.

Infant massage has several advantages as an intervention, including low cost, can be performed by

parents after training, requires no special equipment, and can improve bonding between mother and child. If proven effective, infant massage can be integrated into integrated health service post programs and home visits as part of a comprehensive strategy for managing stunting. Furthermore, this research is expected to raise awareness among health workers and the public about the importance of non-pharmacological interventions in managing stunting through a holistic approach that combines nutritional interventions, parenting, and complementary therapies such as infant massage (Central Statistics Agency of North Sumatra Province, 2020).

Sleep problems in babies are common, affecting approximately 44.2% of babies. However, 72% of parents consider them a minor issue. However, sleep problems can disrupt a baby's growth, weaken the immune system, and disrupt endocrine regulation. To improve sleep quality and optimize child growth and development, infant massage can be a solution. Improved sleep quality and sleep duration through massage is due to increased levels of serotonin, a key neurotransmitter involved in sleep formation and suppressing other brain activity (Suryanis, Susanti, & Triyana, 2022).

Massage is the manipulation of body tissues or organs for healing purposes and is a term used to describe specific manipulative movements of the body's soft tissues. One of the benefits of infant massage is that it can increase blood flow to the muscles, causing vasodilation in the active muscles. This increases the amount of oxygen and other nutrients in the tissues and increases cardiac output. The rate of blood flow through the skin varies depending on the body's metabolic rate and the temperature of the area (Harahap, 2019; Marni, 2019).

RESEARCH METHOD

This study used a quasi-experimental design with a pretest-posttest with a control group design. The study was conducted from October to November 2025 at the Deby Chyntia Yun Childcare Center. The population consisted of all toddlers diagnosed with stunting based on anthropometric measurements. The sample size was 40 stunted toddlers, divided into two groups: 20 in the intervention group and 20 in the control group. The sampling technique used purposive sampling, with inclusion criteria including

Dessy Ratna Sari*, Deby Chyntia Yun, Henny Rista, Eva Donna, Sri Rezeki

Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: dessyratnasari@mitrahusada.ac.id

The effectiveness of complementary baby massage therapy on weight gain in stunting toddlers

toddlers aged 12–36 months, diagnosed with stunting, no chronic illnesses, and obtaining consent from their parents or guardians.

The research instruments used included a digital scale to measure toddler weight, an appetite questionnaire modified from the Infant Feeding Questionnaire, and a daily dietary observation sheet. The intervention group received infant massage therapy six times over two weeks, with a frequency of three times per week. The infant massages were performed by the toddlers' mothers after receiving training from the researchers, using standardized infant massage techniques, with each session lasting 15–20 minutes. Meanwhile, the control group did not

receive infant massage intervention and only received standard health care.

Body weight and appetite measurements were conducted twice: before the intervention (pretest) and one month after the intervention (posttest). The data obtained were analyzed using descriptive analysis to describe the characteristics of the respondents, followed by the Shapiro–Wilk normality test. Differences before and after the intervention within each group were analyzed using a paired t-test, while comparisons between groups were analyzed using an independent t-test. The significance level in this study was set at $\alpha = 0.05$ (Ekadipta & Yora Saki, 2025).

RESEARCH RESULTS

Table 1. Changes in Toddler Body Weight in the Intervention Group

Variables	Mean Pretest (kg)	Mean Posttest (kg)	Mean Difference (kg)	SD	p- value
Toddler weight	8.0	8.85	0.65	0.42	0.001

Based on Table 1, the average weight of toddlers in the intervention group before infant massage was 8.20 kg and increased to 8.85 kg after the intervention. The average weight gain was 0.65 kg. The results of the paired t-test showed a p value of 0.001 ($p < 0.05$), which means there was a significant difference in weight before and after the intervention in the infant massage group.

Table 2. Changes in Toddler Weight in the Control Group

Variables	Mean Pretest (kg)	Mean Posttest (kg)	Mean Difference (kg)	SD	p- value
Toddler weight	8.15	8.32	0.17	0.38	0.084

Based on Table 2, the average weight of toddlers in the control group before observation was 8.15 kg and increased to 8.32 kg at the final measurement. The average weight gain was 0.17 kg. The results of the Paired t-test showed a p value = 0.084 ($p > 0.05$), so there was no significant difference in weight before and after in the control group.

Dessy Ratna Sari*, Deby Chyntia Yun, Henny Rista, Eva Donna, Sri Rezeki

Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: dessyratnasari@mitrahusada.ac.id

DOI: 10.56922/mchc.v4i11.2562

Table 3. Comparison of Weight Gain in the Intervention and Control Groups

Group	Mean Gain (kg)	SD	p-value
Intervention (baby massage)	0.65	0.42	0.002
Control	0.17	0.38	

Based on Table 3. the average weight gain in the intervention group was 0.65 kg, while in the control group it was only 0.17 kg. The results of the Independent t-test showed a p value of 0.002 ($p < 0.05$), which means there was a significant difference in weight gain between the intervention and control groups. This indicates that infant massage therapy is effective in increasing the weight of stunted toddlers.

DISCUSSION

The results of the study showed a significant increase in weight gain in stunted toddlers after receiving complementary infant massage therapy. In the intervention group, the average weight of toddlers increased from 8.20 kg to 8.85 kg, with a difference of 0.65 kg. The statistical test results showed a p-value of 0.001 ($p < 0.05$), indicating a significant difference between weight gain before and after the intervention. This indicates that infant massage is effective in increasing the weight gain of stunted toddlers (Ministry of Health of the Republic of Indonesia, 2024).

Infant massage is a form of complementary therapy that can stimulate the nervous system, improve blood circulation, and stimulate growth and digestive hormones. The touch provided during infant massage can stimulate the vagus nerve, which plays a role in increasing nutrient absorption and accelerating gastric emptying. This condition causes babies to become hungrier more quickly and increase the frequency of breastfeeding, thereby increasing nutrient intake and impacting weight gain.

In the control group, the average weight of toddlers only increased from 8.15 kg to 8.32 kg, with a difference of 0.17 kg. The statistical test results showed a p-value of 0.084 ($p > 0.05$), indicating no significant difference between weight before and after the observation. This indicates that without infant massage intervention, weight gain in stunted toddlers tended to be lower and insignificant.

The comparison test results between the intervention and control groups showed a p-value of 0.002 ($p < 0.05$). This indicates that weight gain in the

group receiving infant massage was significantly higher than in the group not receiving the intervention. Thus, complementary infant massage therapy proved more effective in increasing weight gain in stunted toddlers compared to standard care.

These results align with previous research suggesting that infant massage can increase the weight of infants and toddlers. Research by Field et al. showed that infants receiving massage therapy experienced faster weight gain than infants not receiving massage. This is due to increased vagus nerve activity, which results in increased digestive enzyme production and nutrient absorption.

Furthermore, research also states that infant massage can improve sleep quality, enhance appetite, and improve blood circulation and digestion. These conditions indirectly contribute to weight gain in infants and toddlers (Roesli, 2001). In the context of stunting, weight gain is an important indicator of improving nutritional status. Non-pharmacological interventions such as infant massage can be an easy, safe, and economical alternative to implement in the community, particularly in healthcare facilities such as private midwife practices (Biana, Cecagno, Porto, Cecagno, Marques, & Soares, 2021; Mrayan, Abujilban, AbuKaraki, & Nashwan, 2024). The results of previous studies showed that there were 793 grams of infant weight gain in the intervention group and 400 grams in the control group. There were differences in pretest and posttest results in each intervention group ($p = 0.000$) and the control group ($p = 0.000$) and there was an effect of infant massage on infant weight ($p = 0.000$). Although both experienced

Dessy Ratna Sari*, Deby Chyntia Yun, Henny Rista, Eva Donna, Sri Rezeki

Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: dessyratnasari@mitrahusada.ac.id

The effectiveness of complementary baby massage therapy on weight gain in stunting toddlers

weight gain in the intervention and control groups, the weight gain in the intervention group was almost double compared to the control group and there was also an effect of massage on infant weight (Carolyn, Suprihatin, & Agustin, 2020).

According to previous research, the decrease in stunting prevalence in the treatment group was 22.8%, while in the control group it was 8.6%. The prevalence of underweight in the treatment group did not change significantly (2.9%), while in the control group it increased by 11.7%. The increase in body length in the treatment group was 4.49 cm, and in the control group it was 3.23 cm; infant massage significantly affected the body length of infants aged 0-3 months ($p = 0.000$). The average increase in infant weight in the treatment group was 825.7 g, and in the control group was 702.9 g; infant massage did not significantly affect body weight ($p = 0.224$). Thus, infant massage can be an alternative in increasing the length and weight of infants aged 0-3 months (Taqwin, Linda, Kusika, Ramadhan, Radhiah, & Bohari, 2022). Meanwhile, other research revealed that there was no effect of baby massage on weight gain (Fauziah & Wijayanti, 2018).

sample size and limited intervention time. Furthermore, other factors such as diet, health conditions, and family environment can also influence toddler weight gain, but these were not fully controlled for in this study.

Overall, the results of the study indicate that complementary therapy, infant massage, is effective in increasing the weight gain of stunted toddlers. Therefore, infant massage can be recommended as a supporting intervention in community stunting reduction efforts.

CONCLUSION

Complementary infant massage therapy has been shown to be effective in increasing the weight of stunted toddlers, as indicated by a significant increase in weight in the intervention group compared to the control group, as well as a significant difference before and after the intervention. Therefore, infant massage can be used as a safe, simple, and easy-to-implement non-pharmacological intervention in efforts to improve the nutritional status of stunted toddlers. For future researchers, it is recommended to develop research involving a larger sample size,

extend the duration of the intervention, and consider other variables such as nutritional intake, parenting patterns, and toddler health conditions to obtain more comprehensive and generalizable results.

REFERENCES

- Azizah, N., Sembiring, I. S., Sembiring, M., Asnika, A., Sinaga, R., & Purnamasari, D. (2021). Peningkatan Kualitas Kesehatan Ibu Dan Anak Melalui Pemanfaatan Buku KIA (Kesehatan Ibu Dan Anak) Untuk Pencegahan Stunting. Prosiding Konferensi Nasional Pengabdian Kepada Masyarakat Dan Corporate Social Responsibility (Pkm-Csr), 4, 350-353.
- Biana, C. B., Cecagno, D., Porto, A. R., Cecagno, S., Marques, V. D. A., & Soares, M. C. (2021). Non-pharmacological therapies applied in pregnancy and labor: an integrative review. *Revista da Escola de Enfermagem da USP*, 55, e03681.
- Carolyn, B. T., Suprihatin, S., & Agustin, C. (2020). Pijat bayi dapat menstimulus peningkatan berat Badan pada Bayi. *Jurnal Ilmiah Kebidanan Indonesia*, 10(02), 28-33.
- Central Statistics Agency of North Sumatra Province. (2020). Human Development Index (HDI) of North Sumatra in 2020. Retrieved from: <https://sumut.bps.go.id/en/publication/2021/01/29/05ab6b7e627ee574998166ea/index-pembangunan-manusia-provinsi-sumatera-utara-2020.html>
- Duarba, I. M. K. A., Mediastari, A. A. P. A., & Wiryana, I. B. (2023). Manfaat pijat bayi dalam perbaikan kualitas tidur balita di Praktek Bidan Mandiri Ni Made Sinarsari: The benefits of infant massage in improving sleep quality in infants at Ni Made Sinarsari's Independent Midwifery Practice. *Widya Kesehatan*, 5(2), 33-42.
- Emmaria, R., Sinaga, K., Manurung, B., Tobing, R. A. L., Lubis, R. D., & Sihombing, P. A. (2024). Edukasi penanganan dan pencegahan gizi kurang pada balita di wilayah kerja Puskesmas Rantang Kota Medan tahun 2024. *Jurnal Pengabdian Kolaborasi Dan Inovasi IPTEKS*, 2(4), 1309-1314.

Dessy Ratna Sari*, Deby Chyntia Yun, Henny Rista, Eva Donna, Sri Rezeki

Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: dessyratnasari@mitrahusada.ac.id

DOI: 10.56922/mhcc.v4i11.2562

The effectiveness of complementary baby massage therapy on weight gain in stunting toddlers

- Fauziah, A., & Wijayanti, H. N. (2018). Pengaruh Pijat Bayi terhadap Kenaikan Berat Badan dan Kualitas Tidur Bayi di Puskesmas Jetis Yogyakarta. *PLACENTUM Jurnal Ilmiah Kesehatan Dan Aplikasinya*, 6(2), 14-19.
- Harahap, N. R. (2019). Pijat bayi meningkatkan berat badan bayi usia 0-6 bulan. *Jurnal Kesehatan Prima*, 13(2), 99-107.
- Marni, M. (2019). Pengaruh pijat bayi terhadap peningkatan berat badan pada bayi. *Jurnal Kebidanan Indonesia*, 10(1), 12-18.
- Ministry of Health of the Republic of Indonesia. (2024). Profil Kesehatan Indonesia 2023. Retrieved from: <https://kemkes.go.id/id/profil-kesehatan-indonesia-2023>
- Mrayan, L., Abujilban, S., AbuKaraki, A., & Nashwan, A. J. (2024). Evaluate the effectiveness of using non-pharmacological intervention during childbirth: an improvement project in Jordanian maternity hospitals. *BMC Women's Health*, 24(1), 605.
- Pangaribuan, I. K., Said, F. M., Rahim, S. B. A., Hassan, H. C., & Poddar, S. (2023). Stunting Care Application (SCATION) and Its Effect in Early Detection of Stunting in Toddlers in Langkat District. *JK Practitioner*, 28.
- Roesli, U. (2001). Pedomani pijat bayi prematur & bayi usia 0-3 bulan. Niaga Swadaya.
- Suryanis, I., Susanti, M., & Triyana, R. (2022). Efektifitas Pijat Bayi Menggunakan Aromaterapi Minyak Esensial Cananga Odorata Terhadap Kualitas Tidur Bayi Usia 6–12 Bulan Berisiko Stunting. *Jurnal Doppler*, 6(2), 65-69.
- Taqwin, T., Linda, L., Kusika, S. Y., Ramadhan, K., Radhiah, S., & Bohari, B. (2022). The effectiveness of baby massage in stunting prevention: study based on body length gain in infants aged 0–3 months. *Open Access Macedonian Journal of Medical Sciences*, 10(E), 1184-1189.
- UNICEF. (2022). Strategic plan 2022–2025. Retrieved from: <https://www.unicef.org/media/115646/file/Strategic%20Plan%202022-2025%20publication%20English.pdf>
- World Health Organization. (2021). Improving Early Childhood Development. Retrieved from: <https://www.who.int/publications/i/item/97892400020986>

Dessy Ratna Sari*, Deby Chyntia Yun, Henny Rista, Eva Donna, Sri Rezeki

Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: dessyratnasari@mitrahusada.ac.id

DOI: 10.56922/mchc.v4i11.2562