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Effectiveness of *Melongas* Toddler Massage on Appetite and Sleep Quality of Stunting Toddlers

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Abstract

Stunting is a condition of growth failure in toddlers, with the incidence rate in the North Lombok Regency reaching 19.3% in 2023. Although *melongas*, a traditional message technique widely practiced by the local community, is believed to support growth and development, there is currently no scientific evidence validating it in addressing stunting. The research aims to determine *melongas* massage's effectiveness on stunted toddlers' appetite and sleep quality. The research method uses a quantitative approach, a quasi-experimental with a nonequivalent control group design. The sampling technique uses saturated sampling. The research population consisted of 96 toddlers. Massage for toddlers using *melongas* method is carried out 2 times a week, lasting 10 to 15 minutes for 4 weeks. Data were analyzed using the Wilcoxon signed-rank test. The result revealed that most stunted toddlers who received massage therapy based on the *melongas* method experienced a significant improvement in appetite (47.91%) and sleep quality (75%). This study examines the relationship between massage therapy based on the *melongas* method and stunted toddlers' appetite (ρ-value 0.021) and sleep quality (ρ-value 0.025). Toddler massage using the *melongas* method effectively increases stunted toddlers' appetite and sleep quality.

Keywords: massage; non-pharmacological treatment; sleep time; toddler health; traditional therapy

INTRODUCTION

Stunting is a condition of growth failure in children under the age of five with a height less than their age (Nirmalasari, 2020). Factors causing high rates of stunting include low energy intake, long duration of illness, low birth weight, low maternal education level, low family income level, low protein intake level, and non-exclusive provision of breast milk (Amirullah et al., 2020). According to World Health Organization (WHO), stunting worldwide will reach 22%, or 149.2 million, in 2023. The incidence of stunting in Indonesia in 2023 is 21.5%, West Nusa Tenggara 24.6%, and North Lombok Regency 19.3%. The Ministry of Health has several programs to prevent and overcome stunting, such as providing blood supplement tablets for young women, additional food and health checks for pregnant women, additional animal protein food for children aged 6 to 24 months, and ultrasound for pregnant women.

Non-pharmacological complementary therapy such as toddler massage, can prevent and manage stunting (Saputri and Tumangger, 2019). Toddler massage is an inexpensive, easy-to-do alternative treatment that stimulates toddler growth and development. Previous research shows that

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toddler massage can have a hunger effect, so breastfeeding frequency is higher (Oktavia, 2020). In addition, toddler massage also has the effect of relieving pain in toddlers, relaxing the toddler's body, and has an impact on improving sleep quality so that absorption of nutrients will be better and help optimize the increase in the toddler's height (Habibah et al., 2021; Mrljak et al., 2022).

Previous research shows that if massage is done regularly, it can increase catecholamine hormones (epinephrine and norepinephrine), which can stimulate toddler growth and development by increasing appetite, increasing body weight, and stimulating brain development, structure, and function (Mulyati et al., 2017; Merida and Hanifa, 2022). Toddler massage aims to affect nerves, muscles, respiratory system, and blood circulation. In addition, toddler massage can be used as a form of affection between parents and children through skin touch (Ramdhani et al., 2020; Indrayani et al., 2022).

Toddler massage has been widely practiced in Indonesia, including in North Lombok Regency, where it is usually called *melongas*. *Melongas* is one of the local pearls of wisdom of North Lombok Regency, which has been passed down from generation to generation, involving traditional massage therapists using oil made by themselves from a mixture of candlenuts and castor bean shoots, which are local plants that are easily accessible (Norman and Roggman, 2025). *Melongas* is a common thing done by the people of North Lombok Regency because it is believed to have many benefits for toddler growth and development. *Melongas* is also usually used as a treatment for toddlers who are sick or have developmental disorders such as being late in sitting, crawling, standing, walking, and so on.

The urgency of this research is the still high rate of stunting in toddlers in North Lombok Regency, which is 19.3%, so serious handling is needed (Rahayu et al., 2024). Treatment efforts can be carried out through non-pharmacological complementary therapy in the form of stretching, which is commonly carried out and is believed by the community to benefit toddlers' growth and development (Ramdhani et al., 2020). However, until now, no data has shown that toddler massage with the *melongas* method is effective for the growth and development of stunted toddlers. The problem-solving strategy is formulated by assessing the effectiveness of *melongas* on the growth and development of stunted toddlers, measured by looking at the results of the comparison of the pretest and posttest in the experimental group and the control group on research indicators consisting of appetite and sleep quality in stunted toddlers.

This study assesses the effectiveness of the *melongas* method, one of the local wisdom methods for toddler massage in the North Lombok Regency. The community has high confidence in the benefits of *melongas* on toddler growth and development. *Melongas* activities involve traditional massage therapy, using oil made from candlenuts and castor shoots, which are local plants that are easy to reach. The assessment of the effectiveness of *melongas* on the growth and development of stunted toddlers is measured by indicators of appetite and sleep quality of stunted toddlers. The novelty of this study is that there has never been any previous study that examines the effectiveness of toddler massage with the *melongas* method to see the growth and development of stunted toddlers, with indicators of appetite and sleep quality of stunted toddlers. So, this study aims to determine the effectiveness of *melongas* massage on appetite and sleep quality of stunted toddlers.

MATERIALS AND METHOD

Subjects

This study is a quantitative, quasi-experimental design with a nonequivalent control group design. This study was conducted from June to July 2024. The population in this study consisted of stunted toddlers in Tanjung Sub-district, North Lombok Regency, totaling 96 toddlers. The sampling technique is saturated sampling, meaning all populations are research subjects. The sample size was 48 stunted toddlers in the experimental group and 48 stunted in the control group.

Subjects in each group were allocated using the simple random sampling method. This study's inclusion criteria were stunted toddlers aged 24 to 59 months. The exclusion criteria in this study were stunted toddlers with comorbidities who were on a diet program and were diagnosed as having nerve and bone disorders. The dropout criteria in this study were stunted toddlers who did not participate in *melongas* at least 2 times and stunted toddlers who exhibited allergic skin

characteristics due to using traditional castor bean and candlenut oils.

Measurements

The data collection process began with a pretest stage in the experimental and control groups, measuring the appetite and sleep quality of stunted toddlers before massage using the *melongas* method. Appetite measurement using the 24-hour recall method was performed in the experimental and control groups at the pretest and posttest stages. The 24-hour recall method is a form about the types of food stunted toddlers consume at breakfast, lunch, and dinner. The 24-hour recall form was filled in by the toddler's mother, who the researcher accompanied. Recall measurements were taken twice a week for 4 weeks, namely, 1 day before the massage and 1 day after the massage. This study assessed sleep quality using the Brief-Pittsburgh Sleep Quality Index (B-PSQI) questionnaire. Data was collected twice a week over 4 weeks, specifically 1 day before and 1 day after each massage session. The questionnaire covered various aspects of sleep, including bedtime, wake-up time, the average number of nighttime awakenings, the time required to fall back asleep, daytime sleep duration (from morning to afternoon), the length of uninterrupted sleep, and the toddler's condition upon waking. This questionnaire has previously undergone validity and reliability testing, with a significance value (Sig.) greater than 0.05 and a Cronbach's alpha coefficient of 0.865.

Melongas

In the treatment phase, a massage procedure was carried out in the experimental group using the *melongas* method, carried out 2 times a week for 10 to 15 minutes for 4 weeks. *Melongas* massage treatment is done in the afternoon before the toddler baths and dinner. *Melongas* is carried out by three traditional massage therapists who are experienced and trusted by the community. Before treatment, a process of equal perception was carried out between traditional massage therapists regarding *melongas* up and the parts of the toddler's body that will undergo the *melongas* process. The parts of the toddler's body that are massaged are the back, stomach, hands, and feet. *Melongas* uses oil made personally from crushed candlenuts and mixed with castor oil shoots every time a treatment is given. In the posttest stage, weight and height were measured again in the experimental group after all treatment procedures were carried out in the experimental group. Meanwhile, in the control group, only traditional oil was applied without massage with the same frequency as the intervention group.

Statistical analysis

Descriptive statistics in this study are presented as frequencies and percentages. Analytical data were analyzed using the Wilcoxon signed-rank test with the level of significance set at 5% (ρ-value < 0.05).

Ethical clearance

This study has passed the ethical clearance test: 083/EC-04/FK-06/UNIZAR/V/2024.

RESULTS AND DISCUSSION

This study was conducted on 48 stunted toddlers in the experimental group and 48 in the control group. The characteristics of the study respondents are presented in Table 1. Based on the data, massage for toddlers using the local wisdom *melongas* method effectively increases the growth

Table 1. Characteristics of stunted toddlers in the intervention and control groups

Respondent characteristics	Intervention group		Control group	
	F	%	F	%
Age (months)				
≥ 24–35	16	33.3	10	21.0
36–46	11	23.0	20	41.5
47–59	21	43.7	18	37.5
Total	48	100.0	48	100.0
Gender				
Male	20	41.6	18	37.5
Female	28	58.4	30	62.5
Total	48	100.0	48	100.0
Breast milk				
Exclusive	43	89.5	47	98.0
Nonexclusive	5	10.5	1	2.0
Total	48	100.0	48	100.0
Weight				
Increase	36	75.00	12	25.00
Decrease	3	6.25	15	31.25
Constant	9	18.75	21	43.75
Total	48	100.00	48	100.00
Height				
Increase	29	60.41	14	29.17
Still	19	39.59	34	70.83
Total	48	100.00	48	100.00

of stunted toddlers. This is proven by the fact that most stunted toddlers who were massaged using the *melongas* method experienced an increase in weight, namely 36 toddlers (75%) and an increase in height, namely 29 people (60.41%).

The normality test results can be seen in Table 2. The results of the normality test using the Shapiro-Wilk test in the intervention group and control group showed a sig. value of > 0.05 for both measurements of appetite and sleep quality. This means the data is typically distributed.

The results showed the frequency distribution of the effectiveness of toddler massage with the local wisdom method of *melongas* on the growth and development of stunted toddlers, as in the following Table 3. It can be seen that toddler massage with the local wisdom *melongas* method effectively improves the growth and development of stunted toddlers. This is evidenced by the majority of stunted toddlers who were massaged with the *melongas* method experiencing an increase in appetite, namely 23 people (47.91%), and improved sleep quality, namely 36 toddlers (75%).

Based on Table 4, it can be seen that there is an increase in the average appetite of stunted toddlers who were massaged with the local wisdom method of *melongas* from the pretest of 15 points and the posttest of 21 points. The study's results also showed a significant relationship between toddler massage through the *melongas* method and increased appetite of stunted toddlers, as evidenced by a ρ-value of < 0.05, which is 0.021. In addition, the results showed an increase in the average sleep quality of stunted toddlers who were massaged with the *melongas* method from the pretest of 12 points and the posttest of 17 points. The results also showed a significant relationship between toddler massage through the *melongas* method and the sleep quality of stunted toddlers, as evidenced by a ρ-value of < 0.05, which is 0.025.

Stunting is a condition of growth failure in toddlers caused by a lack of energy intake, long duration of illness, low birth weight, low education level, family income, and so on (Chairunnisa et al., 2023). Handling efforts can be done through non-pharmacological complementary therapy in the form of toddler massage, commonly known as *melongas*, by the people of the North Lombok Regency. *Melongas* is commonly done and is believed to benefit toddler growth and development. This study assesses the effectiveness of the *melongas* method, one of the local wisdom methods for toddler massage in the North Lombok Regency. The community has high confidence in the benefits of *melongas* on toddler appetite and sleep quality. The *melongas* activity involves traditional massage therapy, using oil made from candlenuts and castor shoots, which are local plants that are easily accessible (Wijayanti and Sulistiani, 2019).

The study results showed that toddler massage with the *melongas* method effectively increased the appetite and sleep quality of stunted toddlers in the intervention group. There was an increase in the average appetite and sleep quality of stunted toddlers who were massaged with the *melongas* method from pretest to posttest. The study's results also showed a significant relationship between toddler massage through the *melongas* method and increasing the appetite and sleep quality of stunted toddlers. Toddler massage through the *melongas* method is carried out on specific body parts to increase appetite by normalizing the function of the digestive system and body metabolism (Winarsih et al., 2022).

Massage performed on the feet, hands, and back can help strengthen the stomach and lymph points, which affects the toddler's appetite (Muliati et al., 2024). Likewise, toddler massage through the relaxing method is calming because it can relax tense muscles, especially in the upper back, neck, and shoulders, so it can improve the quality of toddler sleep. In addition, the toddler's digestive system also becomes smoother so that the toddler's appetite increases and nutrient absorption becomes more optimal

Table 2. Normality test of outcome intervention group and control group

Category	Shapiro-Wilk		
	Statistic	Df	Sig.
Appetite			
Pre-intervention	0.987	10	0.888
Post-intervention	0.980	10	0.892
Pre control	0.978	10	0.974
Post control	0.954	10	0.870
Sleep quality			
Pre-intervention	0.955	10	0.735
Post-intervention	0.968	10	0.812
Pre control	0.973	10	0.891
Post control	0.984	10	0.921

Table 3. Distribution of the frequency of effectiveness of *melongas* toddler massage on the appetite and sleep quality of stunted toddlers

Indicator	Intervention group		Control group	
	f	%	f	%
Appetite				
Increase	23	47.91	6	12.50
Decrease	7	14.59	5	10.41
Still	18	37.50	37	77.09
Total	48	100.00	48	100.00
Sleep quality				
Improved	36	75.00	12	25.00
Decrease	3	6.25	15	31.25
Still	9	18.75	21	43.75
Total	48	100.00	48	100.00

Table 4. Effectiveness of *melongas* toddler massage on the appetite and sleep quality of stunted toddlers

Indicator	Intervention group				Control group				ρ-value
	N	Min	Max	Mean	N	Min	Max	Mean	
Appetite									0.021
Pretest	48	13.0	17.2	15.0	48	13.0	17.0	15.0	
Posttest	48	15.0	24.0	21.0	48	13.0	18.0	16.0	
Sleep quality									0.025
Pretest	48	12.0	16.0	14.0	48	11.0	15.0	12.0	
Posttest	48	17.0	28.0	24.0	48	12.0	15.8	12.7	

(Carolin et al., 2020). In addition, *melongas* massage, which involves gentle stretching and pulling movements, can further stimulate the nervous system and improve blood circulation. This technique helps relieve muscle stiffness and tension, promoting more profound relaxation. As a result, toddlers experience better sleep quality and increased appetite as the body's metabolic and digestive functions are more effectively supported (Astuti et al., 2025).

Giving a massage to stunted toddlers at least once a day can stimulate the vagus nerve, stimulate intestinal peristalsis, and accelerate gastric emptying. This will make toddlers feel hungry quickly and thus will stimulate the appetite of stunted toddlers (Munir and Winarsih, 2024). Stimulating local acupoints with toddler massage manipulation through the *melongas* method can influence the gastrointestinal muscle group, improve peristaltic function, reduce gastric residue, and improve digestive system function (Evasari et al., 2020). Specific acupoints commonly targeted during the massage include Zhongwan (CV12) on the upper abdomen and associated with stomach function. Tianshu (ST25) is situated lateral to the umbilicus and is related to intestinal regulation. Zusanli (ST36), positioned below the knee, is known for promoting digestion and enhancing systemic vitality. Sanyinjiao (SP6), located above the medial malleolus, harmonizes the spleen and stomach functions (Schneider, 2025; Widianti, 2025). Toddler massage through the *melongas* method allows stunted toddlers to get a massage on the abdomen, which can smooth the toddler's digestion process. Continuous stimulation through massage can provide a local heat effect that can increase blood circulation in the intestinal area and reduce abnormalities in the gastrointestinal system. After the massage, the toddler will feel hungry and thirsty. This can cause an increase in the need for more food (Maulida et al., 2024).

In addition, giving toddlers massages using the *melongas* method, which is routinely done, can stimulate digestive hormones, namely insulin and gastrin. Insulin is essential in carbohydrate metabolism, glycogen storage, fatty acid synthesis, amino acids, and protein synthesis. These two hormones function to stimulate digestion, which improves the absorption of food essence and can increase toddler weight (Chloranyta et al., 2024).

The positive impacts of regular toddler massage are that it will make toddlers more relaxed and calm and improve blood circulation to improve the functions of body organs properly (Winarsih et al., 2022). The results of similar studies also say that toddler massage is one of the relatively easy interventions that can improve the brain development of stunted babies and can potentially enhance nerve development in babies (Kumbhojkar and Akbani, 2020). In addition, direct toddler massage can stimulate growth and development because massage can guarantee continuous body contact to maintain a sense of security in babies and strengthen the bonds of love between parents and their toddlers (Taheri et al., 2018).

CONCLUSIONS

Toddler massage using the local wisdom *melongas* method has been proven effective in improving appetite and sleep quality in stunted toddlers. A strength of this study is its focus on local wisdom that has not been previously researched in the context of stunted toddler growth and development. However, a limitation of this study is the inability to determine whether the observed effectiveness is due to the *melongas* massage technique or the use of the traditional castor leaf remedy. Therefore, it is recommended that future research conduct a more in-depth study on the use of conventional castor leaf remedies in melongas massage and undertake a comparative analysis of *melongas* massage and other massage techniques.

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