

The Effect of Facial Massage on Mouth Closure Ability in Toddlers

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ABSTRACT

Background: Feeding difficulties associated with poor mouth closure ability may impair oral motor function and negatively affect nutritional intake and child growth. Facial massage has been introduced as a simple, non-pharmacological intervention to stimulate facial muscles and improve oral motor performance; however, evidence regarding its effectiveness among toddlers remains limited. This study aimed to determine the effect of facial massage on mouth closure ability among toddlers at Pal 3 Community Health Center, Pontianak.

Methods: A quantitative pre-experimental study with a one-group pretest–posttest design was conducted from January to March 2026 at Pal 3 Community Health Center, Pontianak. A total of 40 toddlers aged 1–5 years were recruited using purposive sampling. Facial massage using almond oil was administered twice weekly. Mouth closure ability was assessed before and after the intervention using a structured observation checklist. Data were analyzed using descriptive statistics and inferential analysis, with statistical significance set at $p < 0.05$.

Results: Before the intervention, 90.0% of toddlers demonstrated poor mouth closure ability, while only 10.0% showed good mouth closure ability. Following facial massage, the proportion of toddlers with good mouth closure ability increased to 90.0%, whereas the proportion with poor mouth closure ability decreased to 10.0%. The mean mouth closure score increased from 2.25 ± 2.34 to 7.20 ± 2.80 , with a mean difference of 4.95 ± 0.47 . Statistical analysis revealed a significant improvement after the intervention ($p < 0.001$).

Conclusion: Facial massage significantly improved mouth closure ability among toddlers and may serve as a safe, simple, and cost-effective complementary intervention to enhance oral motor function in primary healthcare settings.

INTRODUCTION

Optimal growth and development during early childhood depend on adequate nutritional intake and appropriate oral motor function. Feeding difficulties are among the most common nutritional problems in toddlers and may contribute to inadequate nutrient intake, growth impairment, and an increased risk of stunting (Soliman et al., 2021). According to the World Health Organization (WHO), Southeast Asia continues to experience one of the highest prevalences of childhood stunting worldwide (Azriani et al., 2024). Indonesia remains among the countries with a substantial burden of stunting despite recent improvements, indicating the need for comprehensive preventive strategies that address both nutritional and functional feeding problems (Mulyani et al., 2025).

Feeding difficulties in toddlers are multifactorial and may arise from poor appetite, gastrointestinal disorders, or oral motor dysfunction (Dharmaraj et al., 2023). One common manifestation of oral motor

dysfunction is the inability to maintain proper mouth closure during eating, resulting in ineffective chewing, prolonged feeding time, food spillage, and inadequate nutritional intake (de Sire et al., 2022). If left untreated, these problems may adversely affect children's nutritional status, physical growth, and developmental outcomes.

Management of feeding difficulties includes both pharmacological and non-pharmacological approaches (Franchinotti et al., 2025). Pharmacological interventions generally involve vitamin and micronutrient supplementation, whereas non-pharmacological interventions include herbal therapy, acupressure, acupuncture, and therapeutic massage (H.-L. Chen et al., 2023). Recently, facial massage has gained attention as a simple, safe, and non-invasive intervention to stimulate facial muscles involved in oral motor function. By improving muscle tone, sensory stimulation, and neuromuscular coordination, facial massage may enhance mouth closure ability and facilitate more effective feeding in toddlers (Voniaty et al., 2021).

Previous studies have primarily investigated facial massage for improving feeding ability in infants or children with developmental disorders. However, evidence regarding its effectiveness in improving mouth closure ability among healthy toddlers experiencing feeding difficulties remains limited, particularly in Indonesian primary healthcare settings. This lack of evidence highlights the need for further investigation to support evidence-based non-pharmacological interventions for managing feeding problems in early childhood.

Therefore, this study aimed to determine the effect of facial massage on mouth closure ability among toddlers at Pal 3 Community Health Center, Pontianak. The findings are expected to provide scientific evidence supporting facial massage as a practical and affordable intervention to improve oral motor function and contribute to better nutritional outcomes among toddlers.

METHODS

This study employed a quantitative pre-experimental design using a one-group pretest–posttest approach to evaluate the effect of facial massage on mouth closure ability among toddlers. The study was conducted at the Pal 3 Community Health Center, Pontianak, Indonesia, from January to March 2026. The study population consisted of 120 toddlers aged 1–5 years. A total of 40 participants were recruited using purposive sampling based on predetermined inclusion criteria.

Data were collected using a structured observation checklist to assess toddlers' mouth closure ability before and after the intervention. Baseline measurements (pretest) were performed prior to the intervention. Facial massage using almond oil was then administered twice weekly throughout the study period by trained personnel following a standardized procedure. At the end of the intervention, participants underwent a posttest assessment using the same observation checklist to evaluate changes in mouth closure ability.

Data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to summarize participants' characteristics and mouth closure ability. Inferential analysis was conducted using a paired t-test to compare pretest and posttest scores. Statistical significance was established at a p-value of less than 0.05.

The research process consisted of participant recruitment, eligibility screening, and obtaining informed consent from parents or legal guardians. Eligible participants completed the pretest assessment, followed by the facial massage intervention administered twice weekly during the study period. After completion of the intervention, a posttest assessment was conducted using the same instrument. The collected data were then processed and analyzed to determine the effectiveness of the intervention.

Ethical approval for this study was obtained from the appropriate Health Research Ethics Committee prior to the commencement of the research. Written informed consent was obtained from the parents or legal guardians of all participants before data collection. Participants' confidentiality and privacy were maintained throughout the study, and all collected data were used solely for research purposes.

RESULTS

The results present the changes in toddlers' mouth closure ability before and after facial massage intervention. Univariate analysis describes the distribution of mouth closure ability at the pretest and posttest assessments, while bivariate analysis examines the effect of facial massage on the observed changes.

Table 1. Distribution of Mouth Closure Ability Before and After Facial Massage (Univariate Analysis)

Mouth Closure Ability	n	%
Before Facial Massage		
Good	4	10.0
Poor	36	90.0
After Facial Massage		
Good	36	90.0
Poor	4	10.0
Total	40	100

Table 1 shows that before the intervention, most toddlers demonstrated poor mouth closure ability during feeding (90.0%), while only 10.0% showed good mouth closure ability. Following the facial massage intervention, the proportion of toddlers with good mouth closure ability increased markedly to 90.0%, whereas those with poor mouth closure ability decreased to 10.0%.

Table 2. Effect of Facial Massage on Mouth Closure Ability Among Toddlers (Bivariate Analysis)

Variable	Mean $\pm$ SD (Pretest)	Mean $\pm$ SD (Posttest)	Mean Difference	p-value
Mouth Closure Ability	2.25 $\pm$ 2.34	7.20 $\pm$ 2.80	4.95 $\pm$ 0.47	<0.001

The bivariate analysis demonstrated a significant improvement in mouth closure ability following facial massage. The mean score increased from 2.25 $\pm$ 2.34 before the intervention to 7.20 $\pm$ 2.80 after the intervention, with a mean difference of 4.95 $\pm$ 0.47. Statistical analysis showed that the improvement was significant ($p < 0.001$), indicating that facial massage had a significant effect on improving mouth closure ability among toddlers.

DISCUSSION

Mouth Closure Ability Before and After Facial Massage (Univariate Analysis)

The univariate analysis demonstrated a substantial improvement in toddlers' mouth closure ability following the facial massage intervention. Before the intervention, 90.0% of toddlers exhibited poor mouth closure ability during feeding, whereas only 10.0% demonstrated good mouth closure ability. After the intervention, this pattern was reversed, with 90.0% of toddlers showing good mouth closure ability and only 10.0% remaining in the poor category. These findings indicate that facial massage may contribute to improvements in oral motor performance among toddlers.

Mouth closure is an essential component of oral motor function because it enables efficient chewing, proper bolus formation, and coordinated swallowing (Cichero, 2020). Toddlers with poor mouth closure often experience food leakage, prolonged feeding duration, and inefficient mastication, which may contribute to feeding difficulties (Lee, 2025). Improvement in mouth closure ability after facial massage suggests that stimulation of the facial muscles enhances lip sealing and oral motor coordination during feeding (J et al., 2026).

The observed improvement is supported by the physiological principles of facial massage. Gentle tactile stimulation enhances local blood circulation, increases oxygen delivery to facial tissues, and activates sensory receptors within the skin and muscles (Song et al., 2024). This stimulation promotes muscle relaxation while improving the function of facial muscles involved in lip closure, particularly the orbicularis oris, buccinator, and masseter muscles (Kuswandari et al., 2024). Improved muscle performance allows toddlers to maintain better lip closure throughout the feeding process (Panella, 2022).

These findings are consistent with (Arsovski, 2025), who reported that Tui Na facial massage improves muscle function and circulation through stimulation of acupressure points and soft tissues. Likewise, (S.-C. Chen et al., 2024) suggested that regular massage contributes to children's physical development by enhancing circulation and neuromuscular function. Although previous studies primarily focused on feeding behavior and appetite, the present findings provide additional evidence that facial massage may specifically improve oral motor function, particularly mouth closure ability during feeding.

Effect of Facial Massage on Mouth Closure Ability (Bivariate Analysis)

The bivariate analysis revealed a statistically significant improvement in toddlers' mouth closure ability following facial massage ($p < 0.001$). The mean mouth closure score increased from 2.25 ± 2.34 before the intervention to 7.20 ± 2.80 after the intervention, with a mean improvement of 4.95 ± 0.47 . These findings indicate that facial massage effectively improved oral motor performance and achieved the primary objective of this study.

The significant improvement may be explained by the neurophysiological effects of tactile stimulation on the facial muscles and peripheral nervous system. According (Liang et al., 2021), mechanical stimulation of cutaneous receptors increases cell membrane permeability, facilitating sodium (Na^+) and potassium (K^+) ion exchange and generating action potentials within peripheral nerves. These responses enhance neuromuscular activation, improve muscle contraction, and increase coordination of muscles responsible for mouth closure. Repeated stimulation during facial massage may therefore strengthen oral motor function and improve lip closure while feeding.

The findings also support the concept of oral motor stimulation, which emphasizes that repetitive sensory input enhances neuromuscular coordination through adaptive responses of the central and peripheral nervous systems. Better coordination of the facial muscles enables toddlers to maintain lip closure more effectively, thereby improving chewing efficiency and swallowing coordination. Although improved nutritional intake may occur as a secondary benefit, the primary effect observed in this study was the enhancement of mouth closure ability.

Compared with previous studies, the present findings reinforce the effectiveness of non-pharmacological interventions for oral motor dysfunction. (Chmiel & Kurpas, 2026) demonstrated that Tui Na massage improves neuromuscular function through manual stimulation of facial tissues, while (Rakhmawati et al., 2024) reported that massage therapy enhances muscle performance and supports child development. However, most previous studies evaluated appetite or feeding behavior as the primary outcome. In contrast, the present study specifically examined mouth closure ability, providing additional evidence that facial massage directly improves oral motor function among toddlers. This represents an important contribution because oral motor impairment is one of the underlying causes of feeding difficulties and may indirectly affect nutritional status if not properly managed.

Overall, the findings suggest that facial massage is a safe, simple, and cost-effective intervention that can be implemented in primary healthcare settings to improve mouth closure ability among toddlers. Integrating facial massage into community-based child health programs may help address oral motor dysfunction and support optimal feeding performance during early childhood.

CONCLUSION

This study demonstrated that facial massage significantly improved mouth closure ability among toddlers at Pal 3 Community Health Center, Pontianak. The findings indicate that facial massage is an effective non-pharmacological intervention for enhancing oral motor function by improving lip closure during feeding, thereby supporting more efficient feeding performance. These results provide scientific evidence supporting the use of facial massage as a simple, safe, and cost-effective complementary intervention in primary healthcare settings. Future studies with larger sample sizes, control groups, and longer follow-up periods are recommended to further evaluate its long-term effects on oral motor development, feeding outcomes, and nutritional status among toddlers.

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CONFLICTS OF INTEREST

No conflict of interest was found during the research.

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