



# Mercer-Based Holistic Infant Massage, Maternal Self-Efficacy, Mother-Infant Bonding, and Reported Symptom-Resolution Duration in Infants with Common Cold

Desy Maharani Sofia Azizah<sup>1\*</sup>, Nopi Nur Khasanah<sup>1</sup>, Herry Susanto<sup>1</sup>, Sri Wahyuni<sup>1</sup>

<sup>1</sup>Faculty of Nursing Science, Universitas Islam Sultan Agung (UNISSULA), Semarang, Indonesia.

DOI: <https://doi.org/10.29303/f9dysh13>

## Article Info

Received : 21 June 2026

Revised : 27 August 2026

Accepted : 28 September 2026

**Abstract:** Common cold may cause discomfort and increased caregiving demands. Because infants depend on caregivers for symptom monitoring and supportive care, maternal self-efficacy and mother-infant bonding are relevant to care. A holistic infant massage program based on Mercer's Maternal Role Attainment Theory may support maternal caregiving competence. To examine the association of the program with maternal self-efficacy, mother-infant bonding, and reported symptom-resolution duration in infants aged 0–6 months with mild common cold. This quasi-experimental, non-randomized pretest-posttest control-group study involved 40 mother-infant dyads in North Lombok, Indonesia. The researcher assigned 20 dyads to intervention and 20 to control. The intervention comprised education, supervised practice, emotional support, and home massage for 15–20 minutes daily for 7 days. Psychosocial outcomes were analyzed using change scores and baseline-adjusted ANCOVA; symptom-resolution duration used the Mann-Whitney U test. The results indicated that MSES increased more in the intervention group than controls (change difference 15.08 points, 95% CI 12.14–18.02;  $p < 0.001$ ; Cohen's  $d = 3.29$ ), with an ANCOVA-adjusted difference of 16.997 points (95% CI 14.551–19.444;  $p < 0.001$ ). MIBS decreased by  $5.70 \pm 1.75$  versus  $1.80 \pm 1.10$  points (difference  $-3.90$ ; 95% CI  $-4.83$  to  $-2.97$ ;  $p < 0.001$ ; Cohen's  $d = -2.67$ ). Median reported symptom-resolution duration was 3.55 versus 5.50 days ( $U = 1.0$ ;  $p < 0.001$ ;  $r = 0.61$ ). In conclusion, the program was associated with substantial improvements in maternal self-efficacy and mother-infant bonding. Symptom-resolution findings are secondary and exploratory because allocation was non-randomized, assessment was unblinded, and baseline illness severity and duration were not collected.

**Keywords:** Common cold; Infant massage; Maternal self-efficacy; Mother-infant bonding; Maternal Role Attainment

**Citation:** Azizah, D.M.S., Khasanah, N.N., Susanto, H., Wahyuni, S., (2026). Mercer-Based Holistic Infant Massage, Maternal Self-Efficacy, Mother-Infant Bonding, and Reported Symptom-Resolution Duration in Infants with Common Cold. *Lombok Medical Journal*, 5(3), 212-218. <https://doi.org/10.29303/f9dysh13>

## Introduction

Common cold is a frequent acute respiratory illness in infancy and can be caused by multiple respiratory viruses. Although generally self-limiting, respiratory symptoms may cause infant discomfort and increase caregiving demands. Because infants depend heavily on

caregivers for symptom monitoring and supportive care, maternal confidence and caregiving competence are relevant to home management (Zumla et al., n.d. 2026).

Maternal self-efficacy refers to a mother's confidence in performing caregiving tasks and

Email: [sofiaazizahdesymaharani@gmail.com](mailto:sofiaazizahdesymaharani@gmail.com) (\*Corresponding author)

responding appropriately to her infant's needs. Recent infant-massage studies have reported improvements in maternal self-confidence and related psychosocial outcomes, although the magnitude of effects may vary according to population, setting, and intervention protocol (Erçelik & Bal Yılmaz, 2023; Pramitha et al., 2026). The Maternal Role Attainment framework conceptualizes becoming a mother as a developmental and interactional process in which maternal competence develops through involvement, experience, and supportive relationships (Frese & Nguyen, 2022).

Mother-infant bonding is another important maternal-infant outcome. The Indonesian Mother-to-Infant Bonding Scale (MIBS-I) has demonstrated construct validity for assessing bonding in Indonesian mother-infant dyads (Wiguna & Ismail, 2019). Infant massage may provide repeated opportunities for mothers to observe infant cues, practice caregiving behaviors, and engage in positive physical interaction. Previous studies have reported associations between infant massage and maternal confidence, mother-infant interaction, bonding, and other maternal or infant outcomes (Hartanti et al., 2019; Shoghi et al., n.d.; Zhang & Wang, 2019; Danielsson et al., 2024).

Despite this evidence, important gaps remain. Existing studies differ in population, massage protocol, caregiver involvement, setting, and outcome measures, and many focus on healthy or preterm infants rather than infants experiencing acute respiratory symptoms. Few studies have examined maternal self-efficacy, mother-infant bonding, and reported symptom resolution within the same theory-informed nursing program. The present study therefore evaluated a structured Mercer-based holistic infant massage program among mothers and infants aged 0–6 months with mild common cold.

The objective was to examine whether participation in the program was associated with maternal self-efficacy, mother-infant bonding, and reported symptom-resolution duration. The study was designed as a pragmatic, theory-informed nursing intervention rather than a blinded efficacy trial of massage alone.

## Materials and Methods

### Design and Setting

This study used a quasi-experimental, non-randomized pretest-posttest control-group design. It was conducted in the working area of Tanjung Primary Healthcare Center, North Lombok Regency, West Nusa Tenggara, Indonesia, in January–February 2026. Ethical approval was obtained from the Health Research Ethics Committee, Faculty of Nursing Science, Universitas Islam Sultan Agung, Semarang, Indonesia (No. 1467/A.1-KEPK/FIK-SA/IX/2025). Written informed

consent was obtained from all participating mothers before study procedures began.

### Participants and Sampling

Participants were mother-infant dyads recruited using purposive sampling. Eligible infants were aged 0–6 months and had mild common cold based on clinical assessment. Mothers were the infant's primary caregiver, willing to participate and provide informed consent, and able to follow the study procedures. Infants with severe congenital abnormalities, chronic disease or complications requiring special care, hospitalization, or skin conditions that prevented massage were excluded. Mothers unable to complete the study procedures were also excluded.

The sample-size calculation was based on an independent two-group mean comparison using a two-sided  $\alpha$  of 0.05 and 80% power. The calculation used an expected mean difference of 4.8 and standard deviation of 5.0, based on Remedina et al. (2021), and yielded a minimum requirement of 17 participants per group. To anticipate approximately 10% attrition, the target sample was increased to 20 participants per group, resulting in a planned sample of 40 mother-infant dyads. All 40 enrolled dyads completed the study and were included in the final analysis.

Because the study was non-randomized, the researcher directly determined group assignment, with 20 dyads assigned to the intervention group and 20 to the control group. This procedure may introduce selection bias and baseline imbalance. Baseline outcome values were therefore reported, and baseline-adjusted analyses were performed for the psychosocial outcomes.

### Intervention

The intervention was a structured holistic infant massage program informed by the Maternal Role Attainment framework. On day 1, mothers received education on common cold supportive care, infant care, and the purpose and safety of massage. The researcher demonstrated the massage technique, after which mothers practiced under supervision.

The massage sequence included gentle massage of the face, chest, abdomen, upper extremities, lower extremities, and back. The target duration was approximately 15–20 minutes once daily for seven consecutive days. Emotional encouragement, positive reinforcement, and feedback were provided to support maternal participation and perceived caregiving competence.

From days 2–7, follow-up was conducted through home visits and/or direct communication. Daily observation of infant symptoms and comfort was recorded during the follow-up period.

The intervention was multicomponent. Accordingly, the study estimates the association of the complete Mercer-based program—including education, demonstration, supervised practice, massage, follow-up, and emotional support—rather than the isolated physiological effect of massage alone. The control group received routine nursing care and standard health education without structured holistic infant massage training.

Formal participant-level adherence was not calculated because the available analytic dataset did not contain a standardized adherence variable sufficient to generate a verified adherence percentage. Therefore, no 100% adherence claim was made.

## Measures and Data Collection

### Maternal Self-Efficacy

Maternal self-efficacy was measured using the Maternal Self-Efficacy Scale (MSES). The analytic dataset contained continuous MSES values used for statistical analysis, with higher values indicating greater maternal self-efficacy.

Because the available analytic workbook did not contain item-level MSES responses or a separate scoring/transformation worksheet, the exact scoring transformation could not be independently verified. Accordingly, the reported MSES values are presented as the continuous analytic values used in the statistical analysis rather than being assigned to an unverified raw-score range or conversion formula.

### Mother–Infant Bonding

Mother–infant bonding was assessed using the eight-item Mother-to-Infant Bonding Scale (MIBS), with item scores ranging from 0 to 3 and a total score ranging from 0 to 24. In the scoring direction used in this study, higher total scores indicate greater bonding difficulty; therefore, a decrease in MIBS score represents improvement in bonding. The Indonesian MIBS has demonstrated validity for use among Indonesian mother–infant dyads (Wiguna & Ismail, 2019).

### Reported Symptom-Resolution Duration

The daily symptom observation form recorded nasal discharge/rhinorrhea, nasal congestion, and cough, together with infant comfort and sleep. The researcher and mothers were aware of group assignment; therefore, outcome assessment was not blinded.

Reported symptom-resolution duration was recorded daily from the first study day until the recorded common-cold symptoms had resolved and remained absent for 24 consecutive hours. This endpoint represents clinical symptom resolution reported or observed during follow-up and does not establish

laboratory-confirmed viral clearance.

The available analytic dataset did not contain standardized baseline illness-severity scores or the exact number of illness days before enrollment. These variables were therefore not retrospectively reconstructed or imputed and are treated as study limitations.

The dataset did contain maternal age, education, employment, infant age, sex, and previous acute respiratory infection (ARI) history, which were reported as available baseline characteristics. Exclusive-breastfeeding status, household size, household smoking exposure, and a standardized socioeconomic-status measure were not available in the analytic dataset and were not reconstructed.

### Statistical Analysis

Analyses were performed using IBM SPSS Statistics version 27. Continuous variables were summarized using means and standard deviations. Reported symptom-resolution duration was additionally summarized using medians and interquartile ranges because of its non-normal distribution.

Normality was assessed using the Shapiro–Wilk test and variance homogeneity using Levene's test. Baseline continuous variables were compared using independent-samples *t*-tests and categorical variables using chi-square tests when assumptions were appropriate.

For MSES and MIBS, within-group pretest–posttest changes were examined using paired-samples *t*-tests. The primary between-group comparison was based on change scores calculated as posttest minus pretest and analyzed using independent-samples *t*-tests.

Because baseline MSES differed modestly between groups, ANCOVA models were additionally fitted with the posttest score as the dependent variable, group as the main factor, and baseline score as the covariate. Mean differences were reported with 95% confidence intervals and standardized effect sizes. Partial eta squared was reported for ANCOVA effects.

Reported symptom-resolution duration was analyzed using the two-sided Mann–Whitney *U* test because the distribution was non-normal. The rank-based effect size (*r*) was calculated as  $|Z|/\sqrt{N}$ , where *Z* is the standardized Mann–Whitney test statistic and *N* is the total number of participants analyzed. Statistical significance was set at  $p < 0.05$ .

## Result and Discussion

### Results

All 40 mother–infant dyads completed the study: 20 in the intervention group and 20 in the control group. No participants were lost to follow-up.

**Baseline Characteristics****Table 1.** Baseline characteristics of mother–infant dyads

| Characteristic                     | Intervention (n = 20) | Control (n = 20) | <i>p</i> |
|------------------------------------|-----------------------|------------------|----------|
| Maternal age, years, mean $\pm$ SD | 28.39 $\pm$ 1.16      | 29.00 $\pm$ 1.07 | 0.092    |
| Infant age, months, mean $\pm$ SD  | 3.32 $\pm$ 0.30       | 3.46 $\pm$ 0.33  | 0.170    |
| Higher maternal education, n (%)   | 12 (60.0)             | 11 (55.0)        | 0.749    |
| Housewife, n (%)                   | 14 (70.0)             | 10 (50.0)        | 0.197    |
| Female infant, n (%)               | 12 (60.0)             | 10 (50.0)        | 0.525    |
| Previous ARI history, yes, n (%)   | 5 (25.0)              | 6 (30.0)         | 0.723    |
| MSES pretest, mean $\pm$ SD        | 53.40 $\pm$ 3.18      | 51.52 $\pm$ 2.46 | 0.043    |
| MIBS pretest, mean $\pm$ SD        | 12.38 $\pm$ 1.17      | 12.50 $\pm$ 0.73 | 0.699    |

Available demographic characteristics were broadly similar between groups. Baseline MIBS scores did not differ significantly. Baseline MSES was modestly higher in the intervention group ( $p = 0.043$ ); therefore, complete baseline equivalence was not assumed, and baseline-adjusted analysis was used.

**Maternal Self-Efficacy****Table 2.** Maternal self-efficacy before and after intervention

| MSES outcome               | Intervention      | Control          | Between-group estimate           | <i>p</i> |
|----------------------------|-------------------|------------------|----------------------------------|----------|
| Pretest, mean $\pm$ SD     | 53.40 $\pm$ 3.18  | 51.52 $\pm$ 2.46 | $\pm$ 1.89                       | 0.043    |
| Posttest, mean $\pm$ SD    | 72.17 $\pm$ 3.13  | 55.20 $\pm$ 3.96 | $\pm$ 16.97                      | <0.001   |
| Change, mean $\pm$ SD      | +18.77 $\pm$ 4.04 | +3.69 $\pm$ 5.08 | $\pm$ 15.08 (95% CI 12.14–18.02) | <0.001   |
| Cohen's <i>d</i>           | —                 | —                | 3.29                             | —        |
| ANCOVA-adjusted difference | —                 | —                | 16.997 (95% CI 14.551–19.444)    | <0.001   |
| Partial $\eta^2$           | —                 | —                | 0.843                            | —        |

Maternal self-efficacy increased in both groups, with a substantially larger change in the intervention group. The between-group change difference was 15.08 points (95% CI 12.14–18.02;  $p < 0.001$ ; Cohen's  $d = 3.29$ ). The baseline-adjusted ANCOVA confirmed an adjusted group difference of 16.997 points (95% CI 14.551–19.444;  $p < 0.001$ ; partial  $\eta^2 = 0.843$ ).

The magnitude of the observed psychosocial difference is consistent with previous evidence that structured infant-massage training can support

maternal confidence and participation in caregiving, although differences in population and intervention protocol limit direct comparison (Erçelik & Bal Yılmaz, 2023; Pramitha et al., 2026).

**Mother–Infant Bonding****Table 3.** Mother–infant bonding before and after intervention

| MIBS outcome               | Intervention     | Control          | Between-group estimate              | <i>p</i> |
|----------------------------|------------------|------------------|-------------------------------------|----------|
| Pretest, mean $\pm$ SD     | 12.38 $\pm$ 1.17 | 12.50 $\pm$ 0.73 | $\pm$ -0.12                         | 0.699    |
| Posttest, mean $\pm$ SD    | 6.68 $\pm$ 1.06  | 10.70 $\pm$ 1.06 | $\pm$ -4.02                         | <0.001   |
| Change, mean $\pm$ SD      | -5.70 $\pm$ 1.75 | -1.80 $\pm$ 1.10 | $\pm$ -3.90 (95% CI -4.83 to -2.97) | <0.001   |
| Cohen's <i>d</i>           | —                | —                | -2.67                               | —        |
| ANCOVA-adjusted difference | —                | —                | -4.024 (95% CI -4.711 to -3.336)    | <0.001   |
| Partial $\eta^2$           | —                | —                | 0.792                               | —        |

MIBS scores decreased in both groups, with a greater reduction in the intervention group. Because higher scores indicate greater bonding difficulty in the scoring direction used here, the larger decrease represents improvement in bonding.

The between-group change difference was -3.90 points (95% CI -4.83 to -2.97;  $p < 0.001$ ; Cohen's  $d = -2.67$ ), and the baseline-adjusted ANCOVA showed an adjusted group difference of -4.024 points (95% CI -4.711 to -3.336;  $p < 0.001$ ; partial  $\eta^2 = 0.792$ ).

This finding is compatible with previous studies reporting improvements in mother–infant interaction, attachment, or bonding following maternal infant-massage interventions, although previous studies have differed in population, setting, and intervention intensity (Hartanti et al., 2019; Shoghi et al., 2018; Hwu et al., 2023; Danielsson et al., 2024).

**Reported Symptom-Resolution Duration****Table 4.** Reported symptom-resolution duration

| Outcome                             | Intervention (n = 20) | Control (n = 20) |
|-------------------------------------|-----------------------|------------------|
| Mean $\pm$ SD, days                 | 3.62 $\pm$ 0.37       | 5.66 $\pm$ 0.72  |
| Median (IQR), days                  | 3.55 (3.30–3.80)      | 5.50 (5.20–6.33) |
| Mann-Whitney U                      | 1.00                  |                  |
| <i>P</i>                            | <0.001                |                  |
| Rank-based effect size ( <i>r</i> ) | 0.61                  |                  |

Reported symptom-resolution duration was shorter in the intervention group than in the control group ( $U =$

1.00,  $Z = -3.85$ ,  $p < 0.001$ ;  $r = 0.61$ ). However, this outcome was not assessed under blinded conditions, and standardized baseline illness severity and illness duration were not collected. The finding therefore represents an observed association in clinical symptom resolution and should not be interpreted as evidence of accelerated viral clearance.

## Discussion

The main finding of this study was the substantially greater improvement in maternal self-efficacy in the intervention group. The effect remained large after adjustment for baseline self-efficacy, which is important because the non-randomized allocation resulted in a modest baseline difference. Repeated practice of a caregiving skill, feedback, and direct observation of infant responses may plausibly strengthen perceived competence. This interpretation is consistent with previous infant-massage studies reporting improved maternal confidence following structured massage training (Erçelik & Bal Yılmaz, 2023; Pramitha et al., 2026).

The finding is also compatible with the Maternal Role Attainment framework, in which maternal role development is understood as an evolving process supported by involvement, experience, and interaction (Frese & Nguyen, 2022). In the present study, mothers were not passive recipients of information; they were trained and actively performed massage while observing infant responses. Education, supervised practice, positive reinforcement, and repeated caregiving interaction may therefore have contributed to the observed improvement in self-efficacy.

The improvement in mother–infant bonding should be interpreted according to the scoring direction of the MIBS. The intervention group decreased from 12.38 to 6.68, whereas the control group decreased from 12.50 to 10.70. Because higher scores indicate greater bonding difficulty, the larger decrease indicates improvement. This finding is compatible with evidence that maternal infant-massage interventions may support mother–infant interaction, attachment, or bonding, although prior studies differ in population and intervention characteristics (Hartanti et al., 2019; Shoghi et al., 2018; Hwu et al., 2023; Danielsson et al., 2024).

The psychosocial findings should not be attributed to massage alone. The intervention combined massage with education, demonstration, supervised practice, follow-up, emotional encouragement, and positive feedback. Mothers knew that they were receiving the active intervention, and the researcher maintained repeated contact with the intervention group. These features may have generated expectancy, attention, and Hawthorne effects. Thus, the most defensible

interpretation is that the complete Mercer-based program was associated with improvement, whereas the independent contribution of massage itself cannot be isolated.

The shorter reported symptom-resolution duration requires greater caution. Common cold is generally self-limiting, and the present study did not include virologic testing or a standardized baseline illness-severity scale. The researcher and mothers were aware of group assignment, and daily symptom outcomes involved clinical observation rather than blinded assessment. Differences in symptom recognition, recording, caregiver expectations, or attention could therefore have contributed to the observed difference. Accordingly, the symptom-resolution finding should be considered exploratory and hypothesis-generating rather than evidence of accelerated viral clearance.

The findings have clearer nursing implications for maternal psychosocial outcomes than for treatment of the infection itself. A structured program combining education, hands-on skill acquisition, therapeutic touch, and positive reinforcement may be feasible as a complementary family-centered nursing strategy. It should not replace clinical assessment or appropriate management when an infant develops worsening respiratory symptoms, feeding difficulty, dehydration, or other signs of clinical deterioration.

## Limitations

Several limitations should be considered when interpreting these findings.

1. Non-randomized allocation. Group assignment was determined by the researcher rather than randomization; therefore, selection bias and residual confounding cannot be excluded.
2. Lack of blinding. Participants, the researcher, and those involved in symptom monitoring were aware of group assignment. This may have introduced expectancy and measurement bias.
3. Self-reported psychosocial outcomes. Maternal self-efficacy and mother–infant bonding were assessed through maternal responses and may therefore be influenced by social desirability, expectancy, or response bias.
4. Baseline illness information was incomplete. Standardized baseline symptom severity and exact illness duration at enrollment were not collected. Therefore, differences in initial illness status cannot be fully excluded as an explanation for the observed difference in symptom-resolution duration.
5. Potential confounders were unavailable. The analytic dataset did not contain exclusive-breastfeeding status, household size, household

smoking exposure, or a standardized socioeconomic-status measure. These factors could therefore not be adjusted for.

6. Multicomponent intervention. The intervention combined massage with education, demonstration, supervised practice, follow-up, emotional support, and positive reinforcement. The independent effect of massage cannot therefore be separated from the other components.
7. Limited generalizability. The study included 40 mother-infant dyads from a single primary healthcare setting, limiting precision and generalizability to other populations and settings.
8. Outcome-specific statistical power. Although an a priori sample-size calculation was performed for the two-group comparison, the study was not powered separately for every secondary outcome.
9. Clinical rather than laboratory recovery assessment. Symptom resolution was based on recorded clinical symptoms and did not establish laboratory-confirmed viral clearance.
10. Short follow-up. Follow-up was limited to the seven-day intervention period; therefore, the durability of changes in maternal self-efficacy and bonding remains unknown.
11. Intervention adherence was not quantified. Although daily monitoring and follow-up were conducted, the available analytic dataset did not contain a standardized participant-level adherence variable sufficient to calculate a verified adherence percentage.

## Conclusion

A seven-day Mercer-based holistic infant massage program was associated with substantial improvement in maternal self-efficacy and mother-infant bonding among mothers of infants aged 0–6 months with mild common cold. The intervention group also had a shorter reported symptom-resolution duration; however, this finding should be interpreted cautiously as an exploratory association because the study was non-randomized and unblinded and lacked standardized baseline measures of illness severity and illness duration.

The strongest evidence from this study supports the potential value of structured maternal participation, education, hands-on caregiving practice, therapeutic touch, and positive reinforcement as components of a family-centered nursing strategy. The findings should not be interpreted as evidence that infant massage accelerates viral clearance or replaces appropriate

clinical management of infant respiratory illness.

## Acknowledgements

The authors thank the participating mothers and infants, the healthcare professionals at Tanjung Primary Healthcare Center, North Lombok Regency, and the Faculty of Nursing Science, Universitas Islam Sultan Agung, for their support during the study.

## Conflict Of Interest

The authors declare no conflict of interest.

## Ethics Approval and Informed Consent

Ethical approval was obtained from the Health Research Ethics Committee, Faculty of Nursing Science, Universitas Islam Sultan Agung, Semarang, Indonesia (No. 1467/A.1-KEPK/FIK-SA/IX/2025). Written informed consent was obtained from all participating mothers before study procedures began.

## Data Availability

The analytic dataset used in this study is available from the corresponding author upon reasonable request, subject to ethical and institutional restrictions.

## References

- Afand, N., Keshavarz, M., Fatemi, N. S., & Montazeri, A. (2017). Effects of infant massage on state anxiety in mothers of preterm infants prior to hospital discharge. *Journal of Clinical Nursing*, 26(13–14), 1887–1892.  
<https://doi.org/10.1111/jocn.13498>
- Danielsson, M., Lustig, H. H., Garmy, P., & Einberg, E. L. (2024). Mothers' experience of infant massage in child health care: A qualitative interview study. *Nursing Open*, 11(6).  
<https://doi.org/10.1002/nop2.2206>
- Erçelik, Z. E., & Bal Yılmaz, H. (2023). Effectiveness of infant massage on babies growth, mother-baby attachment and mothers' self-confidence: A randomized controlled trial. *Infant Behavior and Development*, 73, 101897.  
<https://doi.org/10.1016/j.infbeh.2023.101897>
- Frese, B. J., & Nguyen, M. H. (2022). The evolution of maternal role attainment: A theory analysis. *Advances in Nursing Science*, 45(4), 323–334
- Hartanti, A. T., Salimo, H., & Widyaningsih, V. (2019). Effectiveness of Infant Massage on Strengthening Bonding and Improving Sleep Quality. *Indonesian*

*Journal of Medicine*, 4(2), 165–175.  
<https://doi.org/10.26911/theijmed.2019.04.02.10>

and SARS-CoV-2-Epidemiology, Pathogenesis, Clinical features, Diagnostics, Therapeutic and Vaccines landscapes Institutional Affiliations.  
[https://doi.org/10.1016/S2213-2600\(26\)00049-4](https://doi.org/10.1016/S2213-2600(26)00049-4)

Hwu, L.-J., Tzeng, Y.-L., Teng, Y.-K., & Liu, S.-J. (2023). Effects of massage intervention on discharged premature infants' weight, parental stress, and parent-child attachment: A randomized controlled trial. *Infant Behavior and Development*, 72, 101867.  
<https://doi.org/10.1016/j.infbeh.2023.101867>

Lin, L., Yu, L., Zhang, S., Liu, J., & Xiong, Y. (2023). The positive effect of mother-performed infant massage on infantile eczema and maternal mental state: A randomized controlled trial. *Frontiers in Public Health*, 10, 1068043.  
<https://doi.org/10.3389/fpubh.2022.1068043>

Midtsund, A., Litland, A., & Hjälmhult, E. (2019). Mothers' experiences learning and performing infant massage—A qualitative study. *Journal of Clinical Nursing*, 28(3–4), 489–498.  
<https://doi.org/10.1111/jocn.14634>

Pramitha, D. A., Hartanto, F., Radityo, A. N., Sarosa, G. I., Mellyana, O., & Anam, M. S. (2026). Enhancing maternal self-confidence through infant massage: a randomized clinical trial among mothers of preterm infants. *Paediatrica Indonesiana(Paediatrica Indonesiana)*, 66(2), 115–121.  
<https://doi.org/10.14238/pi66.2.2026.115-21>

Shoghi, M., Sohrabi, S., & Rasouli, M. (n.d.). The Effects of Massage by Mothers on Mother-Infant Attachment. In *Altern Ther Health Med* (Vol. 24, Number 3).

Wiguna, T., & Ismail, R. I. (2019). Validation study of Indonesian mother-infant bonding scale. *Asian Journal of Psychiatry*, 43, 60–64.  
<https://doi.org/10.1016/j.ajp.2019.05.003>

Zhang, X., & Wang, J. (2019). Massage intervention for preterm infants by their mothers: A randomized controlled trial. *Journal for Specialists in Pediatric Nursing*, 24(2).  
<https://doi.org/10.1111/jspn.12238>

Zumla, A., Hui, D. S., Peiris, M., Perlman, S., Alimuddin Zumla MDPHDFRCP, P., Malik Peiris MDPH, P., Stanley Perlman MDPH, P., & Alimuddin ZUMLA, P. (n.d.). Invited Review: *Lancet Respiratory Medicine* Title: *Respiratory Infections due to Coronaviruses CCCoV, SARS-CoV, MERS-CoV,*