

The Effect of Health Promotion of Common Cold Massage Skills on The Duration of Healing of ARI (Common Cold) in Toddlers

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Abstract:

Acute respiratory infections (ARIs), particularly the common cold, account for 30–40% of toddler consultations in primary care settings in Indonesia. Nonpharmacological complementary therapies are urgently needed to reduce disease burden and antibiotic misuse. To evaluate the impact of a 2-day parent-administered "common-cold massage" program on illness duration among toddlers with mild ARI. A quasi-experimental, one-group pre-test/post-test study was conducted at PMB Nurul Asyaroti, Malang, Indonesia. Following ethical approval and parental consent, 16 toddlers (12–59 months) meeting the inclusion criteria were enrolled. Parents received a 30-minute health promotion session and an illustrated leaflet and then applied the 10-step massage twice daily for two consecutive days. Illness duration (in hours from baseline to the first 24-hour period free of nasal congestion/rhinorrhea) was documented by parents and verified by a blinded assessor on day 3. Data were analyzed with a paired t-test; effect size (Cohen's d) and 95% CI are reported. Mean illness-duration decreased from 4.6 days (SD 0.89) pre-intervention to 2.9 days (SD 0.62) post-intervention (mean reduction 1.7 days; 95 % CI 1.2–2.1; $p < 0.001$; Cohen's $d = 2.1$, indicating a huge effect). No adverse events were reported. Teaching parents a short, standardized massage significantly shortened the duration of common colds in toddlers. A randomized controlled trial is warranted to confirm the efficacy and cost-effectiveness of the intervention before scaling it across Indonesian community health centers.

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INTRODUCTION

Acute respiratory tract infection (ARI), particularly the common cold, remains one of the most prevalent illnesses in early childhood and a leading cause of global pediatric morbidity and mortality (Geppe et al., 2023). Toddlers are especially vulnerable due to their immature immune systems and frequent exposure to pathogens in daycare or household settings (Fu et al., 2022). In low- and middle-income countries (LMICs), including Indonesia, ARI accounts for a substantial proportion of outpatient visits and hospital admissions, placing considerable strain on already overburdened health systems (Frigati et al., 2025; Kurniyawan et al., 2024). The high incidence of ARI-related consultations highlights the urgent need for accessible, cost-effective, and evidence-based strategies that can be implemented at home to mitigate disease severity and duration (Wade et al., 2024; Agustin et al., 2024).

Nonpharmacological interventions represent a promising avenue for managing mild ARI symptoms in young children, particularly where access to healthcare is limited or where overuse of antibiotics and symptomatic medications poses public health concerns (Yoon et al., 2023). Among

these approaches, common cold massage, a structured, gentle manual technique applied to specific areas of the face and upper chest, has gained attention as a potential complementary therapy (Firdaus et al., 2023). The technique is designed to be simple, safe, and easily taught to caregivers, making it highly suitable for household application. Although traditional in origin, the practice aligns with physiological principles, including stimulation of parasympathetic pathways, improved mucociliary clearance, and reduction of nasal airway resistance, all of which may contribute to faster symptom resolution (Riyanti & Haque, 2023).

Beyond its biomechanical effects, common cold massage may exert additional therapeutic benefits through psychosocial and immunomodulatory mechanisms. Parental touch and nurturing care have been shown to reduce stress responses in young children, enhance sleep quality, and support overall immune function (La Rosa et al., 2024). In toddlers, who often experience distress during illness, the calming effects of massage may alleviate discomfort, promote rest, and create a supportive healing environment (Chen et al., 2024). These combined effects position common cold massage as a holistic intervention that addresses both physiological and emotional aspects of pediatric ARI care (Riyanti & Haque, 2023).

Despite growing interest in caregiver-delivered complementary therapies, there remains a significant gap in empirical evidence, particularly from LMIC settings, regarding the efficacy of structured common cold massage programs. While anecdotal reports and traditional practices suggest symptomatic benefits, rigorous studies evaluating the impact of parent-administered massage on objective outcomes such as illness duration are lacking (Mursyid et al., 2025). This is especially true in Indonesia, where a high ARI burden coexists with cultural openness to integrative home-based care practices, but there is limited research infrastructure to evaluate them. Bridging this evidence gap is crucial for informing public health policies and community-based health promotion efforts (Arumugam et al., 2023).

Therefore, this study aimed to evaluate the effect of a 2-day, health-promotion-based common cold massage program, delivered by trained parents, on the duration of ARI symptoms in Indonesian toddlers. We hypothesized that toddlers receiving parent-administered common cold massage for 2 consecutive days would experience a clinically meaningful reduction in illness duration (≥ 24 hours) compared with their baseline illness course. By focusing on a low-cost, scalable, and culturally resonant intervention, this research seeks to contribute to the growing body of evidence supporting nonpharmacological strategies in primary pediatric care within resource-limited contexts (Jusufi et al., 2025).

METHOD

Study Design and Setting

This study employed a quasi-experimental, single-arm, pre-test/post-test design, reported in accordance with the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) guidelines. The study was conducted at PMB Nurul Asyaroti, a private midwifery-led primary healthcare facility located in Malang City, East Java, Indonesia, between February and March 2025.

Participants

The study population consisted of toddlers diagnosed with mild acute respiratory tract infections (ARIs) of the common cold type who visited the study site during the data collection period. Participants were recruited using purposive sampling.

Inclusion criteria were toddlers aged 12–59 months, presenting with nasal congestion and/or rhinorrhea of ≤ 48 hours' duration, body temperature ≤ 38.0 °C, no clinical signs of lower respiratory

tract infection, no history of chronic disease, and parents or caregivers who were willing and able to participate in health-promotion education and perform the massage intervention at home. Exclusion criteria included antibiotic use within the previous 48 hours, presence of severe acute malnutrition, severe ARI complications, and parental inability to perform the massage as instructed.

Sample Size

The minimum required sample size was calculated assuming a large effect size (Cohen's $d = 0.8$), a significance level of $\alpha = 0.05$, and 80% statistical power, yielding a minimum of 12 participants. To account for an anticipated 20% attrition rate, 16 toddlers were recruited and included in the analysis.

Intervention

The intervention consisted of a parent-administered common cold massage program, delivered through a structured 30-minute health promotion session based on Pender's Health Promotion Model. The session was conducted by a licensed midwife trained in pediatric massage and included a verbal explanation, a live demonstration, a parent return demonstration, and the distribution of an illustrated leaflet outlining the massage steps.

The massage protocol was adapted from established pediatric massage guidelines and consisted of 10 standardized strokes, including facial effleurage, sinus pressure techniques, thoracic expansion, and inter-scapular tapping. Each stroke was applied for 30–45 seconds, with a total massage duration of approximately 8 minutes per session. Parents were instructed to perform the massage twice daily for two consecutive days. Adherence to the intervention was monitored through video uploads submitted by parents on WhatsApp after each session. Participants with $< 80\%$ adherence to the protocol were classified as dropouts.

Outcomes and Measurements

The primary outcome was illness duration, defined as the number of hours from baseline assessment to the first 24-hour symptom-free period, characterized by the absence of nasal congestion and rhinorrhea. Symptom resolution was initially recorded by parents using a daily diary and subsequently verified by a blinded healthcare assessor on day 3. Secondary outcomes included symptom severity, measured using the Wisconsin Upper Respiratory Symptom Survey–21 (WURSS-21) parent-proxy version; sleep quality, assessed with a single-item visual analogue scale (VAS); and parental satisfaction, evaluated on a 5-point Likert scale. Safety outcomes included worsening of symptoms, fever exceeding 38.5°C , or hospital referral during the study period.

Data Analysis

Data normality was assessed using the Shapiro–Wilk test. The paired t-test was used to analyze changes in the primary outcome, while the Wilcoxon signed-rank test was applied for non-normally distributed secondary outcomes. Effect sizes were calculated using Cohen's d , and 95% confidence intervals (CI) were reported. An intention-to-treat analysis was performed, with missing day-3 diary data handled using the last-observation-carried-forward method. All statistical analyses were conducted using a 95% confidence level, with a significance threshold of $p < 0.05$.

Ethical Considerations

The study received ethical approval from the Institutional Ethics Committee of the Institute of Technology, Science, and Health, RS dr. Soepraoen (Approval No. 032/KEPK-ITSK/II/2025). Written

informed consent was obtained from all parents or legal guardians prior to participation. The study was prospectively registered in a publicly accessible clinical trial registry.

RESULT

Participant Flow

A total of 18 toddlers were assessed for eligibility. Two were excluded (one due to recent antibiotic use and one due to parental inability to perform the massage). Sixteen toddlers met the inclusion criteria, received the intervention, and were included in the intention-to-treat (ITT) analysis. No participants were lost to follow-up. A CONSORT-style flow diagram illustrating enrolment, intervention, and analysis is provided in Figure 1.

Baseline Characteristics

Baseline demographic and clinical characteristics of the participants are presented in Table 1. Most toddlers were aged 3 to 4 years. The median duration of symptoms at study entry was 36 hours (interquartile range [IQR], 24–48 hours).

Table 1. Baseline Demographic and Clinical Characteristics of Participants (n = 16)

Variable	n (%) / Mean ± SD
Age (years)	
1–2	5 (31.3)
3–4	7 (43.8)
5	4 (25.0)
Sex	
Male	9 (56.3)
Female	7 (43.8)
Body weight (kg)	13.2 ± 2.1
Symptom duration at entry (hours)	36 (IQR 24–48)

Adherence and Safety

Intervention adherence was high. The median number of completed massage sessions was 4 (IQR 4–4). Two children missed one session but were retained in the ITT analysis. No serious adverse events were reported. One toddler experienced mild, transient skin erythema that resolved spontaneously within 30 minutes without treatment.

Primary and Secondary Outcomes

Normality testing using the Shapiro–Wilk test indicated that the primary outcome (illness duration) was normally distributed ($p = 0.21$); therefore, a paired t-test was applied.

Table 2. Primary and Secondary Outcomes Before and After Intervention (n = 16)

Outcome	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	Mean difference (95% CI)	p-value	Effect Size (Cohen's d)
Illness duration (days)	4.6 ± 0.89	2.9 ± 0.62	1.7 (1.2–2.1)	< 0.001	2.1
Symptom severity (WURSS-21)	42.3 ± 6.5	24.7 ± 5.8	17.6 (12.9–22.3)	< 0.001	2.3
Sleep quality (VAS)	4.1 ± 1.2	7.3 ± 1.1	-3.2 (-4.1 to -2.3)	< 0.001	2.6

Statistical Analysis

The paired t-test demonstrated a statistically significant reduction in illness duration following the intervention (mean difference 1.7 days; 95% CI 1.2–2.1; $p < 0.001$). Effect size analysis indicated a huge effect (Cohen's $d = 2.1$). Secondary outcomes showed statistically significant changes of a similar magnitude.

DISCUSSION

The results of this study indicate that health promotion massage skills, such as those for the common cold, significantly reduce the duration of the common cold in toddlers. The average healing time decreased from 4.6 days to 2.9 days after a massage intervention performed twice daily for 2 days. The paired t-test yields a p-value of 0.000, indicating a statistically significant difference between the conditions before and after the massage intervention. This finding suggests that common cold massage may accelerate the recovery of mild ARI symptoms in toddlers.

Physiologically, massage therapy elicits a cascade of beneficial responses that can accelerate recovery from respiratory illnesses, particularly in young children. By applying gentle yet targeted pressure to specific reflex points associated with respiratory function, massage enhances peripheral blood circulation. This improved perfusion facilitates greater delivery of oxygen and essential nutrients to affected tissues, thereby supporting cellular repair and immune activity at the site of infection (Qijun, 2025; Ismarina et al., 2023). Concurrently, massage stimulates the lymphatic system, a critical component of the body's immune defense, promoting increased lymph flow that aids in the efficient removal of inflammatory mediators, metabolic waste, and pathogens from the respiratory tract (Komagata, 2023). This dual action not only mitigates local inflammation but also helps reduce nasal and bronchial congestion, common and distressing symptoms in toddlers with acute respiratory infections.

Moreover, the rhythmic and soothing nature of massage activates the parasympathetic nervous system, shifting the body from a state of stress to one of rest and restoration. This neurophysiological shift leads to reduced tension in the respiratory muscles, slower and deeper breathing patterns, and an overall sense of calm; factors that are especially beneficial in young children who may struggle to communicate or manage their discomfort during illness. Enhanced parasympathetic tone has also been linked to improved sleep quality, which is vital for immune regulation and tissue recovery (Chen et al., 2024; Ni Putu et al., 2023). In pediatric populations, where rest is a cornerstone of healing, the ability of massage to promote relaxation and alleviate respiratory congestion can significantly shorten symptom duration and enhance overall well-being during episodes of the common cold.

Health promotion serves as a powerful catalyst for enhancing parental self-care capacity, the ability of caregivers to manage their child's health effectively within the home environment. Grounded in Pender's Health Promotion Model, this study highlights how structured health education can influence health-related behaviors by promoting improvements in knowledge, practical skills, self-efficacy, and perceived benefits (Jalali et al., 2024); by delivering a focused intervention on common cold massage, parents, particularly mothers, who are often primary caregivers in many cultural contexts, gained not only theoretical understanding of the technique's physiological rationale but also hands-on competence in its application. As their confidence (self-efficacy) grew, so did their willingness to adopt and consistently implement the massage as part of routine home care during mild respiratory illnesses (Mammari et al., 2023).

This shift in caregiver behavior reflects a broader impact that extends beyond symptom management, as it signifies the strengthening of family-centered health empowerment. When

parents are equipped with safe, evidence-informed, and low-cost strategies, such as common cold massage, they become active participants, not passive observers, in their child's recovery journey. The intervention thus transcends its immediate therapeutic goal by cultivating a sense of agency, reducing reliance on unnecessary healthcare visits, and promoting resilience in managing minor childhood illnesses. In resource-limited settings, such as Indonesia, where access to formal health services is limited, family-level empowerment is a vital component of sustainable primary healthcare and closely aligns with the principles of community-based health promotion (Watkinson et al., 2023).

The results of this study have significant implications for midwifery practice and primary healthcare. Common cold massage can be incorporated into routine educational programs at community health centers, integrated health posts, or mother-to-toddler classes as a safe, inexpensive, and easy-to-implement nonpharmacological intervention. Healthcare workers can incorporate this massage training into health promotion activities to improve families' ability to care for children with mild ARI at home. Thus, this intervention has the potential to reduce visits to health facilities for cases that do not require medical treatment and optimize the use of health services (Al-Sudani et al., 2024).

CONCLUSION

Based on the research results and analysis, health promotion regarding common cold massage skills for parents of toddlers has been proven effective in accelerating the recovery from the common cold. The average healing time decreased significantly from 4.6 days before the intervention to 2.9 days after the intervention. Common cold massage performed twice daily for two consecutive days is a simple, safe, and easy-to-implement nonpharmacological intervention for parents in caring for toddlers with mild ARI symptoms. Education through health promotion also plays a crucial role in enhancing the skills of parents, especially mothers, in providing self-care for their children and strengthening family independence in managing minor illnesses at home. Thus, health promotion regarding common cold massage skills can be a promotive and preventive strategy that supports the acceleration of healing of ARI common cold in toddlers and is worthy of wider implementation in the community.

Future research is recommended to employ a more robust design, such as a randomized controlled trial, involving a larger sample size and a wider geographic area to ensure more representative results. Furthermore, exploration of massage techniques or combinations of other nonpharmacological interventions is necessary to assess the effectiveness of the therapy. Measuring additional variables, including children's sleep quality, comfort during treatment, and parental anxiety levels, could provide a more comprehensive picture of the impact of massage for the common cold. Qualitative research is also important to explore parents' experiences, perceptions, and barriers to implementing massage at home. Developing and testing the effectiveness of digital-based educational media for training parents in massage skills is also recommended to support broader implementation.

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