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NON-PHARMACOLOGICAL INTERVENTIONS FOR INFANTILE COLIC: LITERATURE REVIEW

Wulandari[1]*, Arum Meiranny[1]
[1]Program Studi Kebidanan Program Sarjana dan Pendidikan Profesi Bidan,
Fakultas Farmasi, Universitas Islam Sultan Agung
e-mail: wulandarisholekha21@gmail.com

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ABSTRACT

Introduction: Colic in infants is a common condition characterized by episodes of excessive crying without a clear cause, often occurring in infants aged 2-12 months. The exact cause of colic is still unknown, but several factors such as immaturity of the digestive system, food allergies, and psychosocial factors are thought to play a role. Management of colic in infants includes non-pharmacological approaches including changes in maternal diet, proper breastfeeding techniques, infant massage and carrying, and pharmacological approaches. Objective: To determine the appropriate management strategy for infants with colic. Method: The method used in this study is a literature review. Data searches were conducted through Google Scholar and PubMed databases published from 2020 to 2025, identified based on keywords, titles and abstracts. Results: Ten articles examining non-pharmacological interventions in infants with colic were included in this review, with the results showing the effect of non-pharmacological therapies, namely infant massage therapy, rocking, massaging, swaddling, playing music, carrying, compresses, providing a calm environment, chiropractic, acupuncture, Hugo acupressure, foot reflexology, CST, and Therapeutic Touch (TT), on reducing infantile colic symptoms. Conclusion: Non-pharmacological methods can be a more comprehensive strategy in managing infantile colic. In addition to helping relieve symptoms, this strategy can also support the development of the baby's digestive system in the long term.

Keywords: infant colic, management, excessive crying, non-pharmacological therapy

INTRODUCTION

Colic in babies is a condition that often causes concern for parents. This condition is characterized by episodes of excessive crying and difficulty in comforting a healthy, well-fed baby (1) According to (2) the crying of colicky babies follows a specific developmental pattern, with the frequency starting to increase around 2 weeks of age, peaking at 5 to 6 weeks of age, and decreasing around 12 weeks of age. Furthermore, there is a circadian pattern where babies tend to cry more at night than at other times.

Infantile colic is a major cause of anxiety in new parents and is the reason for 10% to 20% of pediatrician visits during the first few weeks of a baby's life (3). This condition usually

appears in the second or third week, peaks around six weeks of age, and begins to improve in 60% of babies by week 12 and 90% by week 16. Babies with colic often show signs such as persistent crying, irritability, and screaming for no apparent reason. During these episodes, which often occur at night, babies tend to be red-faced, pull up their legs, and tense their stomachs. Unfortunately, traditional methods of soothing babies often fail to soothe their crying [(4)].

Some theories suggest that a baby's immature digestive system may be a major cause of colic. Babies who have difficulty digesting food may experience discomfort in their stomachs, which then triggers prolonged crying. Furthermore, gas buildup in the digestive tract is also thought to play a role in causing colic [(5).]

Not only physiological factors, the baby's sensitivity to environmental stimuli is also believed to contribute to the emergence of colic. A cording to research conducted by Rachman & Putri [(6)], babies who are more sensitive to light, sound, or other environmental stimuli tend to experience colic more frequently than other babies. This study also found that psychological factors in parents, such as maternal stress levels, can influence the duration and intensity of colic in infants [(6)].

In addition to internal factors for the baby, a breastfeeding mother's diet can also influence the likelihood of colic. Certain foods consumed by the mother can cause allergies or excess gas in the baby's digestive system. Therefore, it is important for breastfeeding mothers to pay attention to their diet to minimize the risk of colic in their babies [(6)].

In dealing with colic, various methods have been applied, one of which is baby massage therapy. A study conducted by Rachman & Putri [(6)] at the Hanaya Mom and Baby Spa Clinic in Sumedang Regency found that infant massage therapy can significantly help reduce colic symptoms. The results showed that more than half of the infants who received massage therapy experienced significant improvement, with a significance value of $p = 0.013$ (<0.05), indicating a strong association between massage therapy and reduced colic symptoms.

According to the Ikatan Dokter Anak Indonesia (IDAI), infant massage therapy is believed to support digestive function and reduce gas accumulation in infants. This effect is associated with tactile stimulation that may enhance gastrointestinal motility and improve vagal activity. Several studies have investigated this assumption. A randomized controlled trial by Cetinkaya and Basbakkal [(7)], found that infants who received massage therapy showed a significant reduction in colic symptoms, including decreased crying duration and frequency [(7)]. Similarly, a study by Field [(8)], reported that moderate-pressure massage can stimulate the

vagus nerve, leading to improved gastric motility and digestion [8]. Furthermore, a meta-analysis conducted by Zhang et al,. [9], demonstrated that infant massage significantly improved bowel movements and reduced symptoms of functional constipation in infants. a common trigger for colic. Furthermore, this technique can provide a relaxing effect, helping babies sleep better and reducing stress, which can exacerbate colic [9].

Furthermore, Gelfand et al., (2015) also stated that there is a link between colic in infants and a tendency to develop migraines later in life. Children who experienced colic were more likely to experience migraines as adults than those who did not experience colic as infants. This suggests that colic is not only related to digestive problems, but also has neurological aspects that require further attention by medical experts.

Given the various factors that can cause and worsen colic in babies, it's important for parents to understand the best ways to manage this condition. Holding your baby upright, gently massaging their tummy, and creating a calm environment can be initial steps in managing colic. Consulting a medical professional or a trained infant massage therapist can also be an effective solution for parents facing this challenge [6].

Infantile colic is a clinical diagnosis based on history and physical examination after excluding possible pathological causes of excessive crying [11]. With the various treatment methods available, parents are expected to better understand that colic in infants is not a dangerous condition and will diminish as the baby develops. As stated by IDAI, understanding the causes and appropriate treatment strategies can help reduce parental anxiety and increase the baby's comfort in the early years of life.

RESEARCH METHOD

This study used a literature review method by searching articles on Google Scholar, PubMed, and ScienceDirect using the keywords "Infantile colic", "Management of colic in babies", and "Management of infantile colic" with the aim of articles reviewing the management of colic in babies. The articles obtained were reviewed to sort out articles that fit the inclusion criteria consisting of [1] publication year between 2020 and 2024, [2] researching therapy methods for infantile colic. Ten articles were obtained consisting of 1 national article indexed by Sinta, and 9 international articles indexed by Scopus.

RESULTS

The research results were taken from a sample of articles in international and national journals. The analysis of the research articles is shown in Table 1.

Tabel 1. Analisis Artikel Penelitian

No	Researchers	Article Title	Design	Samples	Baby Age	Research Duration	Research Result
1	Rachman & Putri, (2021)	Hubungan Terapi Teknik Pijatan Pada Bayi dengan Keluhan Kolik di Klinik Hanaya Mom and Baby Spa Kabupaten Sumedang	Quantitative, comparative	30 babies	0-6 months	October 2020	There is a significant relationship between infant massage therapy and colic complaints (p = 0.013).
2	Didişen et al., (2020)	Infantile Colic in Infants Aged One-Six Months and the Practices of Mothers for Colic	Descriptive	232 mothers of babies	1-6 months	August – December 2019	67.2% of infants experienced colic, 28.5% met Wessel's criteria. Colic scale score: 65.2±12.6. Most mothers used behavioral methods such as holding (67.6%), rocking (68.7%), changing the baby's position (63.2%), massaging the baby's abdomen (57.4%), and using warm compresses (37.1%).
3	Holm et al. (2021)	The effect of chiropractic care on infantile colic: results from a single-blind randomised controlled trial	Quantitative, single-blind randomized controlled trial	185 babies	2 – 14 weeks	November 2015 – July 2019	The duration of crying in the chiropractic group was reduced by 1.5 hours compared to 1 hour in the control group (p = 0.026).
4	Landgren et al. (2021)	The effect of two types of minimal acupuncture on stooling, sleeping and feeding in infants with colic: secondary analysis of a multicentre RCT in Sweden (ACU-COL)	Quantitative, randomized, controlled multicentre trial	147 babies	2 – 8 weeks	January 2013 – May 2015	The results of the study explained that more parents in groups A (LI4 acupuncture) and B (minimum 1-5 needle acupuncture) compared to group C (no acupuncture) felt that eating and sleeping had changed and colic symptoms had improved (p<0.05).
5	Moghaddam et al., (2021)	Comparison of the Effect of Abdominal Massage and Hugo Point	Clinical Trial Study	114 babies	1 – 3 months	2019	The three groups of Hugo acupressure, abdominal massage, and control differed significantly in terms of mean sleep time

		Acupressure on Infantile Colic Symptoms					scores over four weeks (P<0.001). There was a significant difference between mean crying duration scores in the second, third, and fourth weeks (P<0.001).
6	Karatas & Dalgic, (2021)	Is foot reflexology effective in reducing colic symptoms in infants: A randomized placebo-controlled trial	Quantitative, randomized controlled trial	45 babies	2 weeks – 4 months	June 2016 – March 2017	Infant colic scale and daily crying duration were significantly lower in the intervention group compared to the placebo group (p<0.001).
7	Castejon-Castejon et al. (2022)	Treatment of infant colic with craniosacral therapy. A randomized controlled trial	Quantitative, randomized controlled intervention study	58 babies	< 90 days	March 2015 – December 2016	Statistically significant differences were observed in favor of the experimental group compared to the control group on day 24 in hours of crying (p < 0.001), and also in hours of sleep (p < 0.001) and severity of colic (p < 0.001).
8	Hajilo et al., (2022)	Comparison of the effect of massage and probiotic consumption on infantile colic: A randomized clinical trial	Clinical Trial Study	64 babies	Age under 13 weeks	14 days	Abdominal massage and probiotic consumption both reduced colic in infants (P<0.05), but the massage group had a greater reduction than the probiotic group (P<0.05).
9	Xie & Hong (2022)	Clinical efficacy of magnetotherapy combined with pediatric massage on infantile colic	Retrospective study	120 neonates	0 – 28 days	September 2019 – September 2021	Neonates in the combination group had the shortest crying time and the longest sleep duration, followed by the magnetotherapy and infant massage groups (P < 0.05). From day 2 to day 7 of intervention, pain levels in the combination group decreased significantly, significantly lower than those in the control group (P < 0.05).
10	Beşirik & Geçkil, (2024)	The effect of therapeutic touch on colic symptoms in infantile colic infants: A randomised controlled study	Randomized Controlled Trial (RCT)	64 babies	4–12 weeks	2 weeks	Therapeutic touch (TT) is effective in reducing colic symptoms, decreasing crying duration, and increasing sleep time in infants. TT is recommended as a safe, effective, and inexpensive non-pharmacological method.

DISCUSSION

Colic is a common problem in infants characterized by excessive crying for no apparent reason. An analysis of 10 research articles revealed various non-pharmacological approaches to colic management, including:

1. Baby massage (stimulus touch) can be interpreted as a comfortable, communicative touch between mother and baby. Baby massage helps increase serotonin secretion. Serotonin is a neurotransmitter, or hormone that transmits messages from one part of the brain to another. This serotonin is converted into melatonin. Melatonin's function is to stimulate sleepiness and promote calm, helping babies sleep soundly [(21)]. Massaging your baby for 15–20 minutes once during the day and once at night before bed for 1 week can be used as a non-pharmacological alternative to reduce colic symptoms in babies [(22)].
2. Rocking, massaging, swaddling, playing music, holding, compressing, and providing a calming environment are behavioral methods that every mother can easily implement to prevent and reduce colic symptoms in babies. Mothers can hold and gently rock their babies for 15–25 minutes when colic symptoms appear [(23)]. Carrying can reduce colic symptoms in babies by increasing a sense of security and comfort through skin-to-skin contact and gentle movement, which can help regulate body temperature and calm the nervous system [(22)].
3. Chiropractic is a manual therapy that often involves manipulation of the joints, particularly the spine. Chiropractic care aims to address potential spinal misalignments or limitations that may interfere with nervous system function and can potentially help relieve colic symptoms. Chiropractic can be performed twice a week for two weeks, with sessions lasting 5 minutes [(24)].
4. Acupuncture is a method of treating illness using thin needles at specific points. Minimal acupuncture on infants can improve feeding and sleep quality and relieve colic symptoms. Acupuncture can be performed twice a week for 2 weeks, using points LI4 (unilateral), ST36 (unilateral or bilateral), or Sifeng, depending on the baby's symptoms. The needles are inserted to a depth of approximately 3 mm and held for 2–5 seconds. The needles used are 0.20 x 13 mm [(25)].
5. Acupressure is a treatment technique that involves applying pressure to specific points on the body. Acupressure can inhibit the transmission of pain impulses and increase endorphin levels in the blood, resulting in muscle relaxation, pain relief, and increased comfort. Acupressure to reduce colic in infants can be performed on the Zhongwan

(CV12) point with pressure-kneading manipulation for 2 minutes, Tianshu (ST25) with pressure manipulation for 2 minutes, and Shenque (CV8) with pressure-vibration manipulation for 3 minutes [26].

6. Reflexology is a non-pharmacological complementary therapy for treating various symptoms or conditions. This therapy uses pressure and stimulation on various reflex zones, such as those in the feet and hands, to elicit reactions in other parts of the body [27]. Reflexology to reduce colic in infants can be performed in 3-4 sessions over 8-12 days. Each session lasts approximately 20-30 minutes [28].
7. Craniosacral Therapy (CST) is a gentle therapy that uses light touch on the head, neck, and spine to help improve nervous system function and relieve tension in the baby's body. CST can improve sleep quality, reduce crying hours, and reduce the severity of colic symptoms. Craniosacral therapy (CST) interventions for babies with colic can be performed in 1-3 sessions over 21 days. CST sessions last 30 to 40 minutes [29].
8. Baby abdominal massage is a massage performed with gentle strokes on the surface of the baby's abdominal skin, which aims to produce an effect on the nerves, muscles, respiratory system, and blood circulation. Abdominal massage can be done with the I Love You Massage (ILU), which is a gentle stroking movement on the abdomen that resembles the letters "I," "L," and "U" and can be done for 15 minutes [30]. Stomach massage can also be done using olive oil three times a day (twice during the day and once at night) before bed when the baby is relaxed for 5 minutes [31].
9. Massage is a traditional Chinese medical treatment that involves pushing, holding, and pressing the patient's body surface. The purpose of massage is to promote Qi and blood, and to harmonize Yin and Yang. Massage can improve neonatal colic, relieve symptoms of crying and pain, and improve sleep quality by massaging the abdomen clockwise for 3 minutes, and rubbing the navel for 2 minutes, followed by massaging from the radial side of the forearm, the transverse crease of the wrist to the transverse cubital crease in a straight line for 1 minute. The massage time is 10 minutes and is carried out for 7 days [31].
10. T Therapeutic Touch (TT) is a non-pharmacological treatment method used to reduce the symptoms of infantile colic. Touch is one of the most developed senses from birth and has been shown to soothe infants. TT is recommended for colic relief in infants because it effectively relieves symptoms, reduces crying time, and increases sleep time in infants

with infantile colic. TT can be performed three consecutive days per week for two weeks, with one session per day and 10 minutes per session [33].

Colic is a common problem in infants characterized by excessive crying without an identifiable cause. This review of 10 research articles identified various non-pharmacological approaches for managing infantile colic, including baby massage, behavioral soothing techniques, chiropractic care, acupuncture, acupressure, reflexology, craniosacral therapy, abdominal massage, traditional Chinese massage, and therapeutic touch. Overall, these interventions focus on improving infant comfort, regulating the nervous system, and enhancing gastrointestinal function.

From a methodological perspective, most of the included studies used randomized controlled trials (RCTs) and quasi-experimental designs, which provide moderate to strong evidence in evaluating intervention effectiveness. Several studies applied control groups and pre–post intervention measurements, allowing comparison of outcomes such as crying duration, sleep quality, and frequency of colic episodes. However, variations in intervention duration, frequency, and techniques across studies indicate a lack of standardization in research protocols.

Each intervention demonstrates different mechanisms and levels of evidence. Baby massage and abdominal massage were among the most frequently studied methods, showing consistent benefits in reducing colic symptoms, possibly through stimulation of the vagus nerve and improvement of gastrointestinal motility. Behavioral methods such as rocking, swaddling, and holding are practical and easily implemented by parents, although their effectiveness is often subjective and depends on parental consistency. Complementary therapies such as acupuncture, acupressure, chiropractic, reflexology, and craniosacral therapy also showed positive outcomes; however, these require trained practitioners and may have limited accessibility.

The strengths of the reviewed studies include the use of experimental designs, clear intervention protocols in some studies, and measurable clinical outcomes (e.g., crying duration and sleep patterns). Additionally, the inclusion of multiple non-pharmacological approaches provides a comprehensive overview of alternative colic management strategies.

Nevertheless, several limitations were identified. First, sample sizes in many studies were relatively small, limiting generalizability. Second, heterogeneity in intervention techniques, duration, and outcome measurements makes it difficult to compare results across studies.

Third, some studies relied on parental reporting, which may introduce subjective bias. Fourth, blinding procedures were rarely implemented, increasing the risk of bias. Finally, long-term follow-up data were limited, so the sustainability of intervention effects remains unclear.

Based on these findings, future research should focus on conducting large-scale, well-designed randomized controlled trials with standardized intervention protocols. Researchers should also incorporate objective measurement tools, such as validated colic scales and physiological indicators, to reduce bias. In addition, long-term follow-up studies are needed to evaluate the sustained effects of these interventions. Combining several non-pharmacological approaches into integrated care models may also be explored to enhance effectiveness. Furthermore, education programs for parents should be developed to ensure proper implementation of simple and safe techniques such as baby massage and behavioral soothing methods at home.

In conclusion, while various non-pharmacological interventions show promise in reducing infantile colic symptoms, methodological limitations across studies highlight the need for more rigorous and standardized research to strengthen the evidence base.

CONCLUSION

A review of 10 research articles on the management of colic in infants found that infantile colic is a common condition and can impact not only the infant but also the parents' quality of life. Although the exact cause of colic is not fully understood, prenatal factors, the gut microbiota environment, and psychological and social factors play a role in the severity and frequency of colic in infants.

Non-pharmacological approaches are the primary strategy for managing colic. Techniques such as holding, rocking, changing positions, abdominal massage, warm compresses, Therapeutic Touch (baby massage), foot reflexology, chiropractic, acupuncture, CST, and Hugo acupressure have been shown to reduce crying and improve infant comfort. Furthermore, infant massage-based approaches have also been shown to be effective in helping babies relax and reducing colic symptoms.

The implications of this research point to the importance of educating parents on how to recognize and manage colic appropriately. Healthcare providers need to provide clear information on colic management strategies using evidence-based, non-pharmacological therapies.

Overall, several non-pharmacological methods may provide a more comprehensive strategy for managing infant colic. In addition to helping relieve symptoms, these strategies may also support the long-term development of the baby's digestive system. Therefore, further research is needed to confirm the effectiveness of the various methods tested and to explore other alternatives for managing infant colic.

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