REVIEW ARTICLE

Journal of Pre-Clinical and Clinical Research 2025, Vol 19, No 4, 183-188
www.jpccr.eu

Impact of osteopathic management in infantile colic – a systematic review

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Pawłowski J, Pawłowska K, Pudołek A. The impact of osteopathic management in infantile colic: A systematic review. J Pre Clin Clin Res. 2025;19(4):183–188. doi:10.26444/jpccr/215870

Abstract

Introduction and Objective. Infantile colic is one of the most common functional disorders in early infancy, affecting between 10%–40% of infants in the first months of life (Savino, 2007). It is characterized by repeated episodes of intense crying without an apparent organic cause, lasting at least three hours a day, for three days a week, for a minimum of three weeks. The aim of this review is to analyze the effectiveness of osteopathy in the treatment of infant colic based on scientific research from the last five years.

Review Methods. The literature review was conducted using the PubMed database, selecting articles published within the last five years. The key words used included: osteopathy, infantile colic, manual therapy, crying duration, sleep improvement, randomized controlled trial. The search was limited to experimental studies, including randomized controlled trials (RCTs).

Brief description of the state of knowledge. 5 out of 6 studies demonstrated a statistically significant reduction in crying time for infants undergoing osteopathic therapy, with a decrease ranging from 30 minutes to 2.5 hours per day. Infants receiving osteopathic therapy slept longer, experienced fewer night-time awakenings, and had better sleep quality. Osteopathy contributed to the reduction of bloating, gas, and improvement of bowel peristalsis. Osteopathic therapy also significantly reduced stress levels in the parents of infants suffering from colic.

Summary. Analysis of the literature indicated that osteopathy may be an effective adjunctive method for the treatment of infantile colic. The reviewed studies showed that osteopathic techniques, such as cranio-sacral therapy, visceral therapy, and musculo-skeletal mobilization may contribute to the reduction of colic symptoms, including shortening the duration of crying episodes and improving sleep quality in infants.

Key words

infantile colic, infants, osteopathy

INTRODUCTION

Infantile colic is one of the most common functional gastrointestinal disorders affecting infants, observed in 10% – 40% of newborns in the first months of life [1]. It is characterized by recurrent episodes of intense crying lasting at least three hours a day, three days a week, for a minimum of three weeks, with no apparent organic cause. Although infantile colic itself is not a life-threatening condition, it is known for its chronic nature, affecting the quality of life over time of both the infant and parents, leading to increased stress and a sense of helplessness in the parents [2,3]. The etiology of infantile colic is not fully understood but is believed to include both somatic and behavioural factors. Since infantile colic is a multifactorial condition, a number of different physiological and psychosocial etiologies are mentioned as the main root causes. It has been commonly suggested that colic may occur due to immaturity of the baby's digestive system. Infants suffering from colic often exhibit digestive problems, such as excessive gas and impaired intestinal motility, ultimately leading to abdominal pain and general discomfort [4]. Intestinal dysbiosis is another factor – the microbiota of affected infants was shown to differ from the intestinal microbiota of healthy infants. Notably, babies with infantile colic are reported to have a lower representation of beneficial bacteria, such as *Lactobacillus reuteri*, which may contribute to increased inflammation in the intestines and the severity of colic symptoms [3]. Other important aspects are food intolerances and food allergies, especially to proteins in cows' milk, which can cause inflammation of the intestinal mucosa and the resulting hyperreactivity of the digestive system [5]. In addition to digestive factors, dysfunctions of the autonomic nervous system are also of note. Babies with colic often exhibit increased activity of the sympathetic nervous system and suggest difficulties with emotional regulation, which may result in more frequent and intense crying episodes [6]. Psychosocial factors, such as the quality of parent-child interactions or the level of parenting stress, are also mentioned in the literature. Findings suggest that the infants of mothers experiencing increased levels of stress are more easily over-stimulated and cry more frequently [7].

Due to the complex and ambiguous etiology of infantile colic, its management involves various therapeutic approaches. In general, pharmacological, dietary and manual techniques are used in clinical practice. Pharmacotherapy includes medications such as simethicone to relieve flatulence, as well as antispasmodic agents, but the effectiveness of such measures remains limited [3]. Dietary modifications – such as eliminating potential allergens from the diet of a breastfeeding mother or using highly hydrolyzed milk formulas – may be introduced with the hope of improving the condition of infants

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Received: 07.11.2025; accepted: 19.12.2025; first published: 31.12.2025

with suspected allergies [5]. The use of probiotics, specifically the *Lactobacillus reuteri* strain, is becoming increasingly popular as it is reported to alleviate the symptoms of infantile colic by improving the composition of the intestinal microflora and possessing anti-inflammatory properties [3].

Other notable non-pharmacological methods include infant massage, manual therapy and osteopathic treatment. There is a growing interest in paediatric osteopathy as a safe and effective form of supportive therapy for infants suffering from colic [8]. Osteopathic techniques include:

- craniosacral therapy [4,9];
- musculoskeletal mobilization [6];
- visceral manipulation [5];
- therapeutic touch [10].

OBJECTIVE

The aim of the literature review is to analyze the effectiveness of osteopathic manual therapy in the management of infantile colic, based on the latest scientific findings published in the past five years. The review covers randomized clinical trials (RCTs) that provide the highest level of scientific evidence according to the Evidence-Based Medicine (EBM) hierarchy of evidence. Another aim of the review is to assess the potential clinical benefits and limitations of the available research, which may be crucial for future clinical recommendations and for optimizing the management of infants affected by colic.

MATERIALS AND METHOD

The literature review was conducted based on the PubMed database, covering articles published over the past 5 years. Key words included 'osteopathy' and 'infantile colic'. The search was limited to experimental studies, including randomized clinical trials (RCTs).

Inclusion and exclusion criteria for the review. The following studies were included in the analysis:

1) published in English;
2) enrolling infants aged 0–6 months;
3) evaluating the effectiveness of osteopathic manual therapy in the management of infantile colic;
4) using research methods that meet the standards of Evidence-Based Medicine (EBM), including randomized clinical trials (RCTs).

Studies excluded:

1) published more than 5 years previously;
2) descriptive case studies with no controls;
3) investigating manual methods other than osteopathy;
4) not published in peer-reviewed scientific journals.

Selection of papers. The selection procedure consisted of several stages (Fig. 1):

1) defining words that describe the subject of research: *Osteopathy, Infantile Coli;c*
2) finding the appropriate date range 2020–2025;
3) full-text assessment availability;
4) review of titles and abstracts;
5) elimination of studies that failed to meet the inclusion criteria.

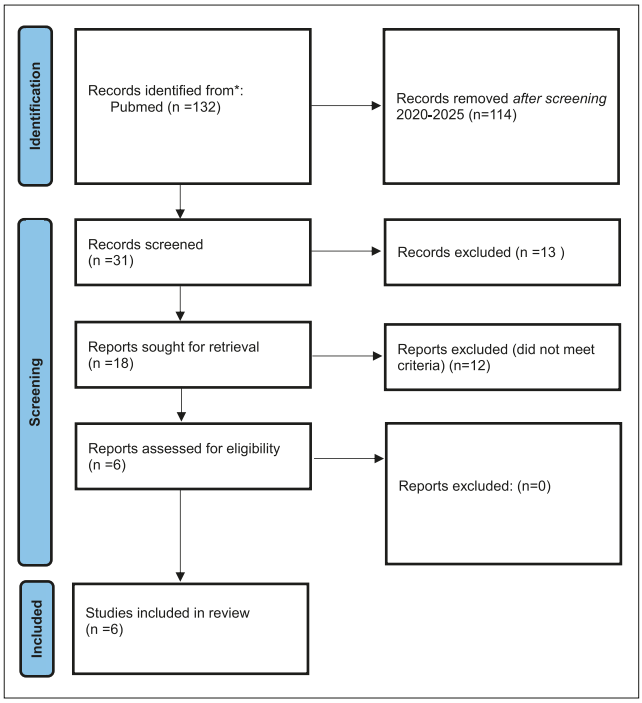

Figure 1. Prisma diagram

After completion of the selection process, a detailed comparative analysis of the findings was performed. First, osteopathic interventions used in infantile colic were identified and classified, including according to treatment characteristics, scope of action, and method of application. Next, the effectiveness of osteopathic interventions was assessed, based on clinical outcomes, considering variables such as reduced crying time, improved sleep quality and reduced digestive symptoms. The analysis also assessed the heterogeneity of findings across the studies to determine the degree to which the obtained data were consistent. In the final stage, the available scientific evidence was synthesized to identify the most important conclusions regarding the effectiveness of osteopathy as a therapeutic option in the handling of infantile colic.

RESULTS

Six studies met the inclusion criteria and were included in the literature review. The analyzed papers consisted of experimental studies, including randomized controlled trials (RCTs). The studies had enrolled a total of 658 infants aged 2–12 weeks, who met the diagnostic criteria for infantile colic. Various osteopathic approaches to the management of infantile colic were examined, including manual therapy, craniosacral therapy, and visceral techniques. Most studies featured experimental groups (osteopathic manual therapy) and control groups featuring standard paediatric care or placebo. Therapeutic touch techniques were also used in some studies as a complementary method.

Types of osteopathic procedures used for infantile colic. Various osteopathic techniques were used in the reviewed studies, including:

- Craniosacral Therapy (CST) – gentle manipulation of the structures of the skull and spine to improve the flow of

body fluids and reduce tension within the nervous system [4].
- Musculoskeletal Mobilization – manual therapy to relax muscles and improve joint mobility, which may reduce tension associated with digestive discomforts [6].
- Visceral Manipulation – manual therapy to improve the function of the digestive system and reduce fascial tension in the abdominal organs [5].
- Therapeutic Touch (TT) – method based on gentle manual contact that can rebalance the infant's level of agitation and improve the baby's ability to self-regulate [10].

Effectiveness of osteopathic interventions. As demonstrated in the reviewed studies, osteopathic manual therapy was shown to have statistically and clinically significant benefits in the management of infantile colic. A significant reduction in crying time in infants exposed to osteopathic therapy compared to the control groups was reported in five of the six studies included in the review. The average reduction in crying time ranged from 30 minutes to up to 2.5 hours per day [5,8]. Improvements in sleep quality were observed, manifested by longer sleep, fewer night awakenings, and an overall improvement in sleep quality compared to control infants [10]. Additionally, osteopathic treatment was shown to have a beneficial effect on reducing digestive disorders, including reduced bloating and gas as well as improved intestinal peristalsis. In terms of the impact of osteopathic manual therapy on the well-being of parents, the use of osteopathy contributed to a significant reduction in stress levels among caregivers of infants suffering from colic, as demonstrated in the study by Schwerla et al. [7].

Clinical benefits of osteopathy in the treatment of infantile colic. Reducing the severity of symptoms and improving the overall comfort of the child are some of the clinical benefits of osteopathic therapy in infantile colic mentioned in the literature. Osteopathic interventions have been shown to provide beneficial effects on both the nervous system and the digestive system, which translates into clinically significant outcomes. A significant reduction in crying time, up to 2.5

Table 1. Characteristics of the studies included in this review

Author (year)	Type of study	Summary
Hestbaek & Stochkendahl (2023)	RCT	The aim of the study was to determine the effectiveness of Craniosacral Therapy (CST) in alleviating the symptoms of infantile colic. The study enrolled 120 infants randomly assigned to intervention and control groups. The craniosacral therapy was administered for 6 weeks. A significant reduction in crying time by 40% was observed in the intervention group compared to the control group. The quality of infants' sleep also improved.
Martínez-Lentisco et al. (2023)	RCT	The aim of the study was to determine the effectiveness of visceral techniques in relieving the symptoms of infantile colic. The study population consisted of 84 infants aged 4–12 weeks who were randomly assigned to a treatment group and a control group. After 4 weeks of visceral therapy, sleep quality improved by 35% and the number of crying episodes decreased by an average of 50%. These findings suggest that visceral techniques may be an effective approach to infantile colic.
Holm & Reilly (2021)	RCT	A randomized trial evaluated the effects of musculoskeletal mobilization on the symptoms of infantile colic. A total of 185 infants were included in the study, some of whom received osteopathic manual treatment for 2 weeks. A significant reduction in crying time by an average of 30 minutes per day compared to the control group was documented. Also, the therapy had a positive impact on the infants' overall mobility and responsiveness to external stimuli.
Schwerla et al. (2025)	RCT	The study examined the impact of manual therapy on the well-being of infants and the stress levels among parents. 103 subjects were enrolled for 3 weeks of therapy. Improved infant comfort, reduced colic symptoms, and lower parental stress levels were observed in the intervention group. Manual therapy was demonstrated to have a beneficial effect not only on infants but also on the parents.
Ateş Beşirik & Geçkil (2024)	RCT	The study objective was to determine the effectiveness of therapeutic touch in reducing the symptoms of infantile colic. The study population consisted of 64 infants aged 2–8 weeks, randomly assigned to either a treatment group or a control group. A significant reduction in crying time and improvement in sleep quality of infants was observed in the intervention group after 2 weeks of therapy. These findings suggest that osteopathic manipulation works well as a supportive treatment for infantile colic.
Castejón-Castejón et al. (2022)	RCT	The study evaluated the effects of craniosacral therapy on infants suffering from colic. The experiment included 58 infants who received the therapy for 4 weeks. A significant reduction in colic symptoms, improved gastrointestinal function and better balancing of circadian sleep rhythm were demonstrated. Infants from the intervention group also showed less irritability and better adaptive responses.

Table 2. Detailed characteristics of studies included in the review

Author (year)	Type of study	No. of subjects	Intervention	Investigators' area of expertise	Outcomes
Hestbaek & Stochkendahl (2023)	RCT	120 infants	Craniosacral Therapy (6 weeks)	Paediatric osteopathy	Crying time reduced by 40%, improved sleep
Martínez-Lentisco et al. (2023)	RCT	84 infants	Visceral Manipulation (4 weeks)	Visceral therapy	Crying time reduced by 50%, improved sleep quality
Holm & Reilly (2021)	RCT	185 infants	Musculoskeletal Mobilization (2 weeks)	Osteopathy	Crying time reduced by 30 minutes/day, improved mobility
Schwerla et al. (2025)	RCT	103 infants	Manual Therapy (3 weeks)	Osteopathy and child psychology	Alleviated symptoms of colic, reduced parental stress
Ateş Beşirik & Geçkil (2024)	RCT	64 infants	Therapeutic Touch (2 weeks)	Osteopathy and alternative therapies	Significant reduction in crying, improved sleep
Castejón-Castejón et al. (2022)	RCT	58 infants	Craniosacral Therapy (4 weeks)	Osteopathy	Reduced colic symptoms, improved gastrointestinal function

hours per day compared to the control groups, was reported in most of the analyzed studies [5]. Moreover, the frequency of colic episodes was reduced by an average of 50% [4]; infants responded better to external stimuli and demonstrated fewer sings of sensory over-stimulation [10]. Significant improvement in muscle tone was also observed, and the symptoms of abdominal discomfort were less severe [7].

Improved infant comfort was manifested by, *inter alia*, better sleep quality and increased ability to self-soothe. Osteopathic therapy positively influenced muscle tone balance, which may relieve ailments related to abnormal intestinal motility and abdominal cramps. Uninterrupted sleep time increased by an average of 1.5 hours per day [6]; the number of nighttime awakenings decreased and circadian sleep rhythm improved [10]. Reduction in abdominal tone and relieved tensions in the structures involved in intestinal function were confirmed in infants exposed to osteopathic treatment [4]. General excitability of the nervous system also decreased, which contributed to an improvement in adaptive behaviours of babies [8].

Osteopathic treatment was shown to help restore the balance of the autonomic nervous system, which translates into improved functioning of the gastrointestinal tract and reduced hypersensitivity of the nervous system in affected infants. Reduced gastrointestinal discomfort is the primary therapeutic outcome of osteopathic treatment. A significant reduction in symptoms, such as bloating or intestinal gas accumulation, was observed in children undergoing osteopathic treatment, which may suggest effective manual relief of tension of visceral tissues [8]. Also, osteopathic treatment helps rebalance muscle tone in the intestines, which leads to improved peristalsis and facilitates the passage of food, reducing the frequency of constipations [6].

By restoring the balance between the sympathetic and parasympathetic systems, osteopathic treatment was observed to reduce the excitability of the nervous system, which may promote better regulation of digestion and alleviate the symptoms of colic [7]. Some researchers also suggest that manual therapy may lead to lower cortisol levels in infants, a physiological biomarker of reduced stress and nervous tension [5]. Importantly, osteopathy can also improve feeding quality – infants in interventional groups demonstrated better sucking ability and fewer swallowing problems, which may have a direct impact on alleviating colic symptoms and increase the child's comfort [10].

Pooled results of the studies suggest that osteopathy may be an effective tool to support the management of infantile colic, improve the comfort of infants and reduce parental stress. Future research should focus on determining the long-term effects of osteopathic treatment and optimizing treatment protocols.

A summary of the study results compared to the control group is presented in Table 3.

DISCUSSION

The studies included in the literature review prove that osteopathy can be an effective approach in managing infantile colic, but the findings should be interpreted with caution. Account should be taken of the research methodology as well as the scope and limitations of the analyzed interventions. With the variety of osteopathic techniques used, including craniosacral therapy, visceral manipulation, musculoskeletal mobilization, and therapeutic touch, the effectiveness of these methods may crucially depend on the specific intervention, infant's age, and the severity of colic symptoms.

Craniosacral therapy was demonstrated to be effective in reducing the symptoms of infantile colic, including crying time and sleep quality, in studies by Hestbaek & Stochkendahl (2023) and Castejón-Castejón et al. (2022). A 40% reduction in crying and improved sleep patterns suggest that this approach may have a beneficial effect on the autonomic nervous system and muscle tone. However, the research methodology offers no evidence to confirm conclusively what mechanism of action is behind this therapy. With the lack of standardized of therapeutic protocols and the small sample sizes, the study findings are not universally applicable to a wider general population. The placebo effect and the subjectivity of parent-reported outcomes should also be considered, as they may lead to an overestimation of the therapeutic effects.

A study by Martínez-Lentisco et al. (2023), showed that visceral manipulation improved sleep quality and reduced crying episodes by 50%. These findings suggest that a therapy that targets the gastrointestinal system may have a direct impact on infantile digestive function, thereby reducing colic-related symptoms. However, there are no objective outcome measures to confirm the actual improvements in the gut function. Moreover, it is unclear whether these benefits demonstrate a genuine therapeutic effect or a placebo effect. Future studies should perhaps include imaging scans, such as ultrasound, to assess the effects of intervention on intestinal peristalsis.

Holm & Reilly (2021) examined musculoskeletal mobilization and its effect on reducing muscle tone and

Table 3. Summary of study results versus control group

Author (year)	Intervention	Results in the intervention group	Results in the control group
Hestbaek & Stochkendahl (2023)	Craniosacral Therapy	Crying time reduced by 40%, improved sleep quality	Little improvement, no significant changes
Martínez-Lentisco et al. (2023)	Visceral Manipulation	Crying time reduced by 50%, improved sleep quality	Small reduction of the crying time, no improvement of sleep patterns
Holm & Reilly (2021)	Musculoskeletal Mobilization	Crying time reduced by 30 minutes/day, improved mobility	No significant improvement compared to the intervention group
Schwerla et al. (2025)	Manual Therapy	Alleviated symptoms of colic, reduced parental stress	Only slight reduction in colic symptoms, no effect on parental stress
Ateş Beşirik & Geçkil (2024)	Therapeutic Touch	Significant reduction in crying, improved sleep	No significant difference compared to the intervention group
Castejón-Castejón et al. (2022)	Craniosacral Therapy	Reduced colic symptoms, improved gastrointestinal function	Only slight reduction in colic symptoms, no improvement in the digestive function

crying time in infants. Although this therapeutic method is widely used, the effectiveness of the intervention compared to other osteopathic techniques is less clear. Although moderate benefits were obtained in the study, there was no clear evidence of the biological mechanisms of action behind this approach. Additionally, the limited sample size and the variety of treatment procedures rendered the study findings inconclusive.

Schwerla et al. (2025) assessed the outcomes of manual therapy and its effect on parental well-being. A significant reduction in parental stress was demonstrated. However, the subjective measures of stress and the absence of appropriate psychometric tools make it difficult to interpret the results accurately. Future research should include standard stress scales, such as the Perceived Stress Scale (PSS), and measurements of cortisol levels as an objective stress measure.

Reduced crying time and improved sleep quality were demonstrated for therapeutic touch (Ateş Beşirik & Geçkil, 2024). This therapy method is indeed non-invasive and easy to use, but the study fails to provide an accurate assessment of the effectiveness of the intervention as no precise mechanism of action was identified, and the study duration was limited. In fact, parent-infant interaction may in itself reduce crying and improve the infant's comfort.

In the context of further research on the effectiveness of osteopathy in the management of infantile colic, it is recommended to carry out well-designed randomized studies featuring larger study populations and carefully selected control groups. With this type of research, statistical analyses will be powered to obtain more reliable results. Also, objective methods for assessing the effectiveness of therapeutic interventions should be an important element of any future research. Measuring cortisol levels for stress monitoring, analyzing sleep parameters using medical technologies, and employing non-invasive imaging techniques to assess gastrointestinal function could significantly increase the reliability and validity of the data obtained. Additionally, osteopathic procedures used for infantile colic need to be standardized. For these methods to be more effectively implemented in clinical practice and made comparable across study sites, the optimal therapeutic methods, duration of individual sessions and frequency of interventions should be determined.

Limitations of the study and future research. All analyzed studies have specific limitations, and the presented study on research on the use of osteopathy in infantile colic is no exception. The findings of many studies rely on subjective parent-reported outcomes and may be exposed to bias. Moreover, therapeutic protocols are non-uniform and the variety of osteopathic techniques used make it difficult to validate their effectiveness. The most common problem is small sample size as it increases the risk of bias and limits the generalizability of findings. The lack of appropriate outcome measures is another concern, as most studies rely on subjective parent-reported outcomes, and the results may be exposed to the expectation bias. Furthermore, differences in treatment protocols make it difficult to compare the results across the studies.

The long-term impact of osteopathy on the health of infants is also an important aspect that should be taken into consideration. In the majority of the analyzed studies, the follow-up period was short (2–6 weeks) and it did not allow for an adequate assessment of whether the effects of the intervention were durable and translate into long-term health and developmental benefits.

Studies with higher methodological quality, more rigorous evaluation and an appropriate level of control are needed to obtain reliable evidence to validate the effectiveness of osteopathy in the management of infantile colic. Future research should focus more on enrolling larger study populations to allow for more reliable and precise statistical analysis and to reduce the risk of bias. It is also necessary to use objective outcome measures to reflect the effectiveness of the intervention, such as monitoring intestinal activity using ultrasound scans, measuring cortisol levels as a physiological biomarker of stress, and capturing infant sleep parameters using available medical technologies.

Notably, treatment protocols should be standardized for reliable comparison of findings across different studies, to be able to reach consistent and valid conclusions. Studies with appropriately selected control groups, including the use of placebo, are also necessary to determine whether the apparent effects of therapy are actually linked to osteopathy or the placebo effect. Additionally, future research should include long-term follow-up to assess the impact of osteopathy on the physical and neurological development of infants in the longer term.

There is promising evidence that osteopathy is a viable supporting therapy for infantile colic, specifically in cases where conventional methods prove ineffective. These benefits may include reducing colic symptoms, improving sleep quality, lower parental stress, and increasing overall comfort for infants.

However, before osteopathy is introduced as a standard of care in infantile colic, additional research with a higher level of scientific evidence is necessary. Its clinical value can only be critically assessed once its mechanisms of action are precisely pinpointed, its effectiveness in comparison with other methods is confirmed, and the possible adverse reactions identified.

CONCLUSIONS

Based on the results of the literature review, osteopathy may prove to be an effective method supporting the management of infantile colic. Studies have shown that osteopathic methods, such as craniosacral therapy, visceral osteopathy, musculoskeletal mobilization and therapeutic touch, can help alleviate the symptoms of colic, reduce crying time and improve the quality of infant sleep.

The following key conclusions can be drawn from the literature review:

1) osteopathic therapeutic interventions can effectively reduce the symptoms of infantile colic, specifically by reducing the frequency and intensity of crying episodes caused by colic;
2) osteopathic manipulative treatment has a positive influence on the quality of infants' sleep, which suggests it helps rebalance both the nervous system and the digestive system;
3) the use of osteopathic techniques can lead to improved gastrointestinal function, including improved intestinal peristalsis and reduced digestive disorders;
4) the benefits of osteopathy are also observed among caregivers of infants – the effectiveness of osteopathic manual therapy may translate into reduced levels of stress in parents.

In conclusion, there is promising evidence that osteopathy can be used as a supportive measure in infantile colic, but further studies performed according to stricter methodological procedures are required before it can be introduced for widespread use.

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