



The Effectiveness of Baby Massage with Bima Garlic (*Allium Sativum*) Essential Oil Dilution in Reducing Infantile Colic Symptoms in Babies

Susanti¹, Erni Faturahmah¹, Sumarni¹, Ade Sucipto², Zahratul Hayati¹

¹Akademi Kebidanan Surya Mandiri Bima

²STIKes Borneo Cendekia Medika

*Corresponding Author: Susanti.usman087@gmail.com

Abstract

Infantile colic is one of the common health problems experienced by infants in early life, characterized by excessive crying and difficulty being soothed. Garlic (*Allium Sativum*) is known to contain bioactive compounds that potentially provide antispasmodic, carminative, and anti-inflammatory effects. Aim of this study was to examine the effectiveness of baby massage with Bima garlic (*Allium Sativum*) essential oil dilution in reducing infantile colic symptoms in babies. This study employed a quasi-experimental design with a pre-test–post-test control group design. The sample consisted of 50 infants divided into two groups: experimental group (n = 25) that received baby massage with Bima garlic essential oil dilution and control group (n = 25) that received baby massage without oil. The results showed a significant reduction in colic symptoms in both groups after the intervention. However, the decrease was greater in the experimental group. Statistical analysis indicated a significant difference in post-test scores between the experimental and the control group ($p < 0.001$). This intervention may be considered an evidence-based, locally grounded complementary therapy that is safe, affordable, and easy to implement in pediatric nursing practice.

Keywords: infantile colic, baby massage, *Allium Sativum*, essential oil, complementary therapy

Keefektifan Pijat Bayi dengan Pengenceran Minyak Esensial Bawang Putih Bima (*Allium Sativum*) dalam Mengurangi Gejala Kolik pada Bayi

Abstrak

Kolik bayi merupakan salah satu masalah kesehatan umum yang dialami bayi di awal kehidupan, ditandai dengan tangisan berlebihan dan sulit ditenangkan. Bawang putih (*Allium Sativum*) dikenal mengandung senyawa bioaktif yang berpotensi memberikan efek antispasmodik, karminatif, dan antiinflamasi. Tujuan penelitian ini adalah untuk menguji efektivitas pijat bayi dengan pengenceran minyak esensial bawang putih Bima (*Allium Sativum*) dalam mengurangi gejala kolik bayi. Penelitian ini menggunakan desain kuasi-eksperimental dengan desain kelompok kontrol pra-uji–pasca-uji. Sampel terdiri dari 50 bayi yang dibagi menjadi dua kelompok: kelompok eksperimen (n = 25) yang menerima pijat bayi dengan pengenceran minyak esensial bawang putih Bima dan kelompok kontrol (n = 25) yang menerima pijat bayi tanpa minyak. Hasil menunjukkan penurunan gejala kolik yang signifikan pada kedua kelompok setelah intervensi. Namun, penurunan lebih besar pada kelompok eksperimen. Analisis statistik menunjukkan perbedaan signifikan pada skor pasca-uji antara kelompok eksperimen dan kelompok kontrol ($p < 0,001$). Intervensi ini dapat dianggap sebagai terapi komplementer berbasis bukti, berakar pada konteks lokal, yang aman, terjangkau, dan mudah diterapkan dalam praktik keperawatan pediatrik

Kata Kunci: kolik bayi, pijat bayi, *allium sativum*, minyak esensial, terapi komplementer

Introduction

Infantile colic is one of the most common functional gastrointestinal disorders in newborns up to the age of three months. It is characterized by intense and recurrent crying without an identifiable cause, often lasting more than three hours per day and occurring more than three days per week (Savino, 2018). Although infantile colic is considered a non-pathological condition and tends to improve with age, its impact can be significant, including disturbances in infant sleep patterns, psychological stress among parents, and impaired mother–infant bonding (Indrio, 2017; Martinelli, 2020; Sung, 2018). Various approaches have been used to manage colic, ranging from pharmacological interventions to non-pharmacological therapies. However, pharmacological treatments often raise concerns due to the potential side effects in infants (Vandenplas, 2015). Therefore, non-pharmacological therapies such as baby massage have emerged as safe and effective alternatives. Baby massage has been shown to stimulate the parasympathetic nervous system, reduce stress, improve gastrointestinal motility, and promote smooth muscle relaxation (Bennett, 2018; Çetinkaya, 2017; Field, 2019).

Several studies have explored the use of aromatherapy oils to enhance the benefits of baby massage. One natural ingredient with therapeutic potential is garlic (*Allium sativum*). Bimanese garlic contains active compounds such as allicin, which exhibit antimicrobial, antispasmodic, and carminative effects (Bayan, 2014; Petrovska, 2017; Shang, 2019). It potentially helping to alleviate digestive disturbances such as colic. However, direct application of garlic to an infant's skin may cause irritation. Therefore, in this study, garlic is formulated as an essential oil dilution, prepared at a safe concentration using carrier oils such as coconut oil or olive oil, to be applied during baby massage (Batiha, 2020; Sharifi-Rad, 2020; Nasir M, 2013). The urgency of this study lies in the need for safe, affordable, and locally based natural alternative therapies for managing infantile colic. In addition, this research highlights the development of local potential, namely Bimanese garlic, as part of the advancement of complementary therapies in pediatric nursing practice (Kemenkes, 2023; Nurrahman M, 2022; Syahrul, 2021).

Previous studies have primarily utilized baby massage interventions with oils such as eucalyptus, lavender, or peppermint (Kartiningsih, 2020; Widyaningsih S, 2021). To date, no study has specifically evaluated the effectiveness of baby massage using essential oil dilution derived from Bimanese garlic (*Allium sativum*) in reducing colic symptoms in infants.

Preliminary data obtained from Mpunda Public Health Center, Bima City, in 2024 indicated that approximately 25% of infants aged 0–3 months experienced symptoms suggestive of infantile colic, such as persistent crying without a clear cause, particularly at night. This figure highlights the need for effective, locally grounded intervention approaches. Further preliminary data in 2025 showed that the distribution of infants and toddlers within the working area of Mpunda Public Health Center was as follows: 13 in Penatoi Village, 8 in Manggemaci Village, 14 in Sadia Village, 11 in Santi Village, 16 in Matakando Village, and 10 in Mande Village. Based on this background, the present study addresses the Effectiveness of Baby Massage with Bima Garlic (*Allium Sativum*) Essential Oil Dilution in Reducing Infantile Colic Symptoms in Babies.

Method

The researchers conducted an in-depth literature review to ensure the safety of using garlic in the form of essential oil for infants, as well as the effectiveness of baby massage in reducing colic symptoms. Based on the literature and exploration of local resources, an intervention was developed in the form of baby massage using a diluted Bimanese garlic oil, which contains allicin compounds with antispasmodic and carminative effects.

The garlic essential oil was diluted using a carrier oil (e.g., virgin coconut oil) to achieve a concentration that is safe for infant skin. The product underwent organoleptic evaluation and preliminary skin safety testing (patch test) prior to administration to the research subjects.

This study employed a quasi-experimental method using a pre-test and post-test control group design. A total of 50 infants presenting with colic symptoms were divided into two groups: an intervention group (baby massage with garlic oil) and a control group (baby massage without garlic

oil). The study was conducted from August to September 2025.

Colic symptoms were assessed using an observation checklist based on colic characteristics, including crying duration, frequency, and time of occurrence, before and after the intervention over a seven-day period. Changes in symptoms were analyzed to determine the effectiveness of the intervention.

Data were analyzed using statistical tests (paired t-test or Wilcoxon test) to identify significant differences between pre- and post-intervention conditions, as well as between groups. This research has obtained ethical permission from Medical and Health Research Ethics Committee, Faculty of Medicine, Al Azhar Islamic University, Mataram with letter number 086/EC-04/FK-06/UNIZAR/VIII/2025.

Result and Discussion

Based on the table 1, the mean maternal age in the control group (32.16 years) was higher than that in the experimental group (28.60 years). Based on the table above, the majority of mothers in the experimental group were senior high school graduates (60%), whereas nearly half of the mothers in the control group held a bachelor's degree (44%).

Based on the table 2, most mothers in the experimental group were senior high school graduates (60%), whereas nearly half of the

mothers in the control group had a bachelor's degree (44%). Based on the table above, the majority of infants in both groups were male, accounting for 72% in the experimental group and 68% in the control group.

Based on the table 3, infantile colic symptoms in both groups were predominantly classified as mild, accounting for 76% in the experimental group and 84% in the control group and the majority of infants in the experimental group showed no infantile colic symptoms (84%), whereas most infants in the control group experienced mild symptoms (88%).

Based on the table 4, the mean infantile colic symptom score in the experimental group (11.20) was lower than that in the control group (12.16). Based on the table above, the mean infantile colic symptom score in the experimental group (5,84) was lower than that in the control group (8,96).

Based on the table 5, the experimental group showed a decrease in the mean colic symptom score from 11.20 to 5.84, with a delta of 5.36 ($p = 0.000$), whereas the control group exhibited a decrease from 12.16 to 8.96, with a delta of 3.20 ($p = 0.000$).

Based on the table 6, the mean colic symptom score in the post-test control group (5.84) was lower than that in the post-test experimental group (8.96), with a delta of 3.15, and this difference was statistically significant ($p = 0.000$).

Table 1. Karakteristik Partisipan Keluarga

Variabel	Category	
	Experimental Group (n= 25)	Control Group (n= 25)
Maternal Age		
Min	20 Year	20 Year
Max	28 Year	42 Year
Mean	28.60 Year	32.16 Year
Infant Age		
Min	1 Weeks	2 Weeks
Max	3 Months	3 Months
Mean	2.16 Months	1.88 Months

Table 2. Maternal Education and Infant Sex

Variabel	Category			
	Experimental Group (n= 25)		Control Group (n= 25)	
	Number	Percentage	Number	Percentage
Maternal Education				
Elementary school	2	8	0	0
Senior high school	15	60	9	36

Diploma (Associate degree)	8	32	3	16
Bachelor's degree	0	0	11	44
Master's degree	0	0	1	4
Infant Sex				
Man	18	72	17	68
Women	7	28	8	32

Table 3. Pre-test and Post Test of Infantile Colic Symptoms (Categorical Data)

Variabel	Category			
	Experimental Group (n= 25)		Control Group (n= 25)	
	Number	Percentage	Number	Percentage
Infantile Colic Symptoms				
Pre Test				
No Symptoms	0	0	0	0
Mild Symptoms	19	76	21	84
Moderate Symptoms	6	24	4	16
Severe Symptoms	0	0	0	0
Post Test				
No Symptoms	21	84	21	84
Mild Symptoms	4	16	4	16
Moderate Symptoms	0	0	0	0
Severe Symptoms	0	0	0	0

Table 4. Pre-test and Post Test of Infantile Colic Symptoms (Numerical Data)

Variabel	Category			
	Experimental Group (n= 25)		Control Group (n= 25)	
Infantile Colic Symptoms				
Pre Test				
Min	8		8	
Max	17		16	
Mean	11.20		12.16	
SD	3.329		2.095	
Post Test				
Min	2		4	
Max	10		12	
Mean	5.84		8.96	
SD	2.340		1.859	

Table 5. Analysis of the Effect of Baby Massage with Bimanese Garlic (*Allium sativum*) Essential Oil Dilution

Colic Symptoms	Experimental		Delta	Sig	Control		Delta	Sig
	Pre	Post			Pre	Post		
Min	8	2	5.36	0.000	8	4	3,2	0.000
Max	17	10			16	12		
Mean	11.20	5.84			12.16	8.96		
SD	3.329	2.340			2.095	1.859		
N	25	25			25	25		

^a Wilcoxon Test

Table 6. Analysis of Differences in Baby Massage with Bimanese Garlic (*Allium sativum*) Essential Oil

Dilution				
Colic Symptoms	Group		Delta	Sig
	Post Eksperiment	Post Control		
Min	4	2	3.15	0.000
Max	12	10		
Mean	8.96	5.84		
SD	1.859	2.340		
Maen Rank	16.52	34.48		
N	25	25		

^a Mann Whitney Test

Pre Test and Post Test of Infantile Colic Symptoms

Based on the pre-test analysis, the majority of infants in both the experimental and control groups experienced infantile colic symptoms classified as mild. In the experimental group, 76% of infants had mild colic, while the remaining 24% experienced moderate colic. No infants were symptom-free or had severe symptoms. Similarly, in the control group, 84% of infants experienced mild colic and 16% experienced moderate colic. The mean colic score in the experimental group was 11.20, whereas the control group had a higher mean score of 12.16.

These findings indicate that both study groups had relatively comparable baseline conditions, despite slight variations in mean scores. This initial homogeneity is essential to ensure the internal validity of the study, as changes observed after the intervention can be more confidently attributed to the treatment rather than to pre-existing differences between groups.

The results of this study are consistent with findings from several recent studies. Wolke and Bilgin (2018) reported that most cases of infantile colic fall into the mild to moderate categories, with a global prevalence ranging from 20% to 25% among infants aged 0–3 months (Bilgin, 2020). Similarly, Saeidi (2015) reported that prior to baby massage intervention, the majority of infants had mild colic scores, with a nearly balanced distribution between the experimental and control groups (Saeidi R, 2015).

A similar study Abdelmaksoud et al. (2020) by in Egypt confirmed that colic symptoms are most frequently characterized by excessive crying at night, with the majority of cases classified as mild (Abdelmaksoud, 2020). Meanwhile, a recent systematic review emphasized that although most cases of infantile colic are considered mild, the symptoms can have a significant impact on infant

sleep quality and increase maternal emotional stress (Miller, 2021).

Thus, the findings of the present study reinforce the general understanding that infantile colic most commonly occurs in the mild to moderate categories and rarely presents as severe. This also underscores the relevance of non-pharmacological intervention studies, such as baby massage using natural ingredients, to help alleviate symptoms experienced by infants.

According to the researchers, the relatively comparable pre-test conditions between the experimental and control groups provided an important foundation for post-intervention comparisons. In addition, several demographic factors examined in this study may be associated with the occurrence and severity of colic. First, maternal age was higher in the control group (32.16 years) than in the experimental group (28.60 years). Younger mothers may have less experience in managing infants and may therefore be less effective in responding to excessive crying, whereas older mothers typically have greater experience and more effective strategies for soothing infants (Johnson, 2015). Second, maternal education showed notable variation. In the experimental group, the majority of mothers had a senior high school education (60%), whereas nearly half of the mothers in the control group held a bachelor's degree (44%). Higher educational attainment may contribute to better understanding of colic symptoms and more appropriate management strategies, including preventive and non-pharmacological approaches (Shorey, 2017). Third, infant age is also an important factor. In this study, the mean infant age in the experimental group was higher (2.16 months) than in the control group (1.88 months). This finding is consistent with theories suggesting that the peak of infantile colic typically occurs at 2–3 months of age, with symptoms gradually decreasing after 4 months

(Sung, 2014). Therefore, the age distribution of infants in this study falls within the critical period for the onset of colic, thereby strengthening the validity of the findings.

Based on the study results, comparisons with previous research, and analysis of demographic factors, it can be concluded that at the pre-test stage, both groups were in relatively comparable baseline conditions, with the majority of infants experiencing mild colic. Maternal age, maternal education, and infant age appear to have potential associations with colic severity, although they are not sole determining factors. This baseline comparability is methodologically important, as it ensures that changes in symptoms observed after the intervention genuinely reflect the effects of the treatment rather than differences in baseline characteristics between groups.

The post-test results demonstrated clear changes following the intervention. In the experimental group, the majority of infants (84%) no longer exhibited infantile colic symptoms, while the remaining 16% experienced only mild symptoms. In contrast, in the control group, most infants (88%) continued to experience mild colic, and only 12% showed no symptoms. Numerically, the mean colic score in the experimental group decreased significantly from 11.20 at pre-test to 5.84 at post-test. In the control group, the mean colic score also decreased from 12.16 to 8.96; however, the magnitude of reduction was smaller than that observed in the experimental group. These findings indicate that baby massage with Bimanese garlic essential oil dilution had a greater impact than baby massage without garlic oil.

In this study, the intervention was administered five times over one week. This consistent frequency is believed to have strengthened the stimulatory effects on the infant digestive system, leading to faster and more significant symptom improvement. These findings are consistent with previous studies demonstrating that baby massage can reduce colic symptoms by stimulating the parasympathetic nervous system, enhancing gastrointestinal motility, and improving infant sleep patterns (Saeidi R, 2015). Other studies have reported that regular baby massage can reduce the frequency and duration of excessive crying, as well as improve infant sleep quality and maternal rest (Miller, 2021).

Abdelmaksoud (2020) reported that simple interventions involving sensory stimulation, such

as baby massage, are effective in reducing the intensity of colic and mitigating its impact on maternal mental health (Abdelmaksoud, 2020). In addition, Bilgin (2020) explained that although colic symptoms often improve with increasing infant age, appropriate non-pharmacological interventions can accelerate recovery (Bilgin, 2020). Thus, the findings of the present study are not only consistent with existing evidence but also provide new insights into the use of Bimanese garlic essential oil combined with baby massage techniques.

The effectiveness of baby massage with Bimanese garlic (*Allium sativum*) essential oil dilution in reducing infantile colic symptoms can be explained through several physiological mechanisms. First, stimulation of the autonomic nervous system occurs through gentle, rhythmic touch during baby massage, activating the parasympathetic nervous system. This activation reduces cortisol levels, promotes relaxation, and improves digestive system function by reducing excessive peristalsis and normalizing intestinal motility (Saeidi R, 2015). Second, increased gastrointestinal motility resulting from abdominal massage helps reduce gas accumulation and facilitates gas expulsion from the digestive tract, thereby alleviating discomfort that triggers excessive crying in infants (Miller, 2021). Third, the pharmacological effects of garlic (*Allium sativum*) play an important role. Garlic contains active compounds such as allicin, which have antispasmodic, carminative, and anti-inflammatory properties. These compounds help relieve smooth muscle spasms in the intestines, reduce excessive gas formation, and soothe the digestive system (Sung, 2014). Through essential oil dilution, the risk of skin irritation is minimized, making its use safe for infants.

The synergistic effects of massage and topical aromatherapy further enhance the intervention's effectiveness. The combination of mechanical stimulation from massage and the bioactive effects of garlic oil produces a synergistic response. Massage enhances the transdermal absorption of active compounds, while the mild aroma of diluted garlic oil may provide additional relaxation effects. Through this mechanism, the intervention administered five times within one week not only reduced colic scores but also helped improve infant sleep patterns, decrease crying intensity, and reduce maternal anxiety.

According to the researchers, the greater reduction in colic scores observed in the experimental group during the post-test phase was not solely attributable to factors such as infant age or maternal education, but primarily to the additional intervention of Bimanese garlic essential oil. The active compounds in garlic contributed substantially to the reduction of gastrointestinal spasms, while massage techniques provided layered physiological benefits. The cumulative effect of five treatment sessions per week further strengthened the overall impact of the intervention.

Based on the study findings, comparisons with previous research, and the underlying physiological mechanisms, it can be concluded that baby massage with Bimanese garlic (*Allium sativum*) essential oil dilution performed five times within one week is effective in reducing infantile colic symptoms. This intervention not only offers clinical benefits for infants but also provides added value as a complementary therapy grounded in local wisdom that is safe, simple, and easy to implement at the family and primary healthcare levels.

Effectiveness of Baby Massage with Bima Local Garlic (*Allium sativum*) Essential Oil Dilution on the Reduction of Infantile Colic Symptoms.

The intervention was administered five times within one week, providing consistent and repeated stimulation for the infants. This regular treatment is believed to strengthen the physiological effects of baby massage and maximize the pharmacological benefits of garlic constituents. The study results showed that in the experimental group, after receiving baby massage with Bimanese garlic (*Allium sativum*) essential oil dilution, there was a significant reduction in infantile colic symptoms. The mean colic score decreased from 11.20 at pre-test to 5.84 at post-test, with a p -value < 0.05 , indicating a statistically significant difference.

These findings are consistent with studies demonstrating that baby massage can reduce stress levels, improve sleep patterns, and alleviate digestive problems, including infantile colic (Field, 2019). Regular baby massage has also been shown to stimulate intestinal motility and improve gastrointestinal function (Kulkarni, 2010). From an herbal perspective, garlic contains active compounds such as allicin, ajoene, diallyl sulfide, and S-allyl cysteine, which exhibit antispasmodic,

carminative, and anti-inflammatory effects, thereby supporting the reduction of intestinal spasms and excessive gas formation (Bayan, 2014). Additionally, fructans in garlic function as prebiotics that help maintain intestinal microbiota balance and reduce excessive fermentation that can trigger colic (Batiha, 2020).

Clinical studies also support the safe use of traditional herbal remedies for managing mild gastrointestinal disorders in infants, including colic (Hanieh S, 2015). Other studies have reported that herbal oils containing bioactive compounds can serve as effective non-pharmacological complementary therapies for reducing colic symptoms (Savino, 2014). Thus, the findings of this study strengthen the evidence that combining mechanical stimulation through baby massage with the bioactive effects of garlic provides greater benefits than using either intervention alone.

According to the researchers, the success of this intervention is closely related to two key factors: the physiological effects of baby massage and the pharmacological properties of garlic. Baby massage provides rhythmic stimulation of the parasympathetic nervous system, inducing comfort, reducing stress, and normalizing intestinal motility. Under normal conditions, infant intestinal peristalsis is still immature, which often leads to gas accumulation and triggers colic. With repeated massage, peristaltic activity becomes more regular, facilitating gas expulsion and reducing symptoms.

Meanwhile, the bioactive compounds in garlic provide additional therapeutic effects that enhance the benefits of massage. Allicin exhibits antispasmodic activity by reducing excessive smooth muscle contractions in the gastrointestinal tract. Ajoene and diallyl sulfide exert anti-inflammatory effects that help reduce intestinal irritation caused by gas and fermentation. Fructans act as prebiotics, promoting the growth of beneficial gut flora and reducing excessive gas production. Thus, the use of Bimanese garlic essential oil offers synergistic complementary effects when combined with baby massage. The researchers also emphasize the social and cultural advantages of this intervention. As a therapy grounded in local wisdom, the use of Bimanese garlic is more readily accepted by the community because the ingredient is widely available, culturally familiar, and traditionally regarded as safe. This enhances the sustainability of the intervention and enables its application not only in

healthcare facilities but also at the household level following appropriate maternal education.

In addition to its clinical benefits, this intervention also reduces maternal psychological burden. Prolonged infant crying due to colic often increases maternal stress, anxiety, and even depressive symptoms. By reducing colic symptoms, both infant and maternal sleep quality improve, supporting the development of positive mother–infant bonding, which is a key goal of midwifery care. Considering the physiological, pharmacological, social, and psychological aspects, the researchers conclude that this intervention is not only statistically effective but also has high practical value in improving the health and well-being of infants and their families.

Differences Between the Experimental Group and the Control Group

The study results demonstrated a significant difference between the experimental and control groups after the intervention. In the experimental group, the mean colic score decreased from 11.20 to 5.84, whereas in the control group the mean score decreased only from 12.16 to 8.96. Statistical analysis showed a p -value < 0.05 , indicating that the difference was statistically significant.

Furthermore, the between-group post-test analysis revealed a delta of 3.15 with a significance level of 0.000. Categorical data also supported these findings, showing that in the experimental group the majority of infants (84%) no longer exhibited colic symptoms, while in the control group most infants (88%) remained in the mild symptom category. These results confirm that baby massage with Bimanese garlic essential oil dilution produced a greater reduction in colic symptoms than baby massage without the addition of garlic oil.

The findings of this study are consistent with previous research indicating that baby massage has a positive effect on reducing colic symptoms and that the addition of herbal-based therapy can enhance the effectiveness of the intervention (Field, 2019; Perry, 2019; Tekgündüz, 2017). reported that the use of herbal therapies in infants with gastrointestinal disturbances yielded better outcomes than in groups without additional therapy (Hanieh S, 2015). Biagioli et al. also demonstrated that herbal- and probiotic-based therapies provided significant benefits in reducing infantile colic compared with standard care (Biagioli, 2016).

Other studies have further emphasized that the integration of complementary therapies based on herbal oils is more effective in reducing symptoms than single-modality interventions (Gruber, 2011). Thus, the results of the present study align with scientific evidence supporting the effectiveness of combined non-pharmacological interventions in producing significant differences between experimental and control groups.

According to the researchers, the significant difference observed between the experimental and control groups not only reflects the effectiveness of the intervention but also demonstrates the added value of incorporating Bimanese garlic essential oil into baby massage. The greater reduction in colic scores, as reflected by the larger delta value, indicates a meaningful pharmacological contribution of garlic in addition to the physiological benefits of baby massage.

The researchers also highlight the important implications of these findings for midwifery practice. While baby massage alone has proven benefits, its combination with a safe, herbal oil grounded in local wisdom enhances its effectiveness. This provides an alternative complementary therapy that is not only rooted in tradition but also supported by scientific evidence. Based on the study findings, comparisons with previous research, and the researchers' analysis, it can be concluded that there is a significant difference between the experimental and control groups in reducing infantile colic symptoms. Baby massage with Bimanese garlic (*Allium sativum*) essential oil dilution is more effective than baby massage without garlic oil. This difference supports the integration of locally based complementary interventions as an additional strategy in midwifery care to improve infant health and family well-being.

Conclusion

The research results found that baby massage with essential oil dilution of Bima garlic (*Allium Sativum*) is effective in reducing symptoms of infantile colic in babies. Baby massage using Bimanese garlic (*Allium sativum*) essential oil dilution performed five times per week was proven to be more effective in reducing infantile colic symptoms than baby massage without oil. This intervention can be considered an evidence-based, locally rooted complementary therapy that is safe,

cost-effective, and easy to implement in pediatric nursing practice.

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