Kırşehir Ahi Evran Üniversitesi/ Kırşehir Ahi Evran University
Sağlık Bilimleri Dergisi/ Journal of Health Sciences
Cilt/Volume: 8 Sayı/Issue: 2 Yıl/Year: 2024
E-ISSN: 2791-7754

Review Article/ Derleme Makale

CURRENT APPROACH IN INFANTILE COLIC AND TREATMENT METHODS

İNFANTİL KOLİKTE GÜNCEL YAKLAŞIM VE TEDAVİ YÖNTEMLERİ

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Date of receipt/ Geliş tarihi: 19 Oct 2023

Date of acceptance/ Kabul tarihi: 08 Feb 2024

Keywords: Infantile colic, nursing, parents

Anahtar kelimeler: İnfantil kolik, hemşirelik, ebeveynler

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ABSTRACT

Infantile colic is referred to be the crying attacks beginning in the first weeks of infants that occur at least three times a day and last longer than three weeks. It may suggest cases of unknown etiology in diagnosis, including gastrointestinal causes, nutrition, trauma, drug use, and neurological conditions. Although there is no definitive treatment in terms of treatment methods, there are some methods applied throughout the process. The positive contributions of pediatric nurses are very important in overcoming the process with less problems for both the infant and the parents. Therefore, benefiting from nursing approaches in colic syndrome cases by getting help from any health institution may be useful in reducing or coping with infantile colic.

ÖZET

İnfantil kolik, bebeklerin ilk haftalarında başlayan günde en az üç defa ortaya çıkan ve üç haftadan uzun süren ağlama atakları olarak ifade edilmektedir. Etiyolojisi henüz tam olarak bilinmeyen, tanısında gastrointestinal nedenler, beslenme, travma, ilaç kullanımı, nörolojik durumlar gibi olguları düşündürebilmektedir. Tedavi yöntemleri bakımından henüz kesin bir tedavisi bulunmamakla birlikte, süreç boyunca uygulanan bazı yöntemler bulunmaktadır. Hem bebek açısından hem ebeveynler açısından sürecin daha az sorunla atlatılabilmesinde çocuk sağlığı ve hastalıkları hemşirelerinin olumlu katkıları oldukça önemlidir. Bu nedenle, kolik sendromu vakalarında herhangi bir sağlık kuruluşundan yardım alarak konuyla ilgili hemşirelik yaklaşımlarından yararlanmak infantil koliğin azaltılması veya baş edilmesinde yararlı olabilmektedir.

To cite/Atıf için: Doğan, S.B., & Yüzer Alsaç, S. (2024). Current approach in infantile colic and treatment methods. *Kırşehir Ahi Evran University Journal of Health Sciences, 8*(2), 245-262.

INTRODUCTION

Infantile colic is a condition in infants with normal nutrition and development, manifested by unstoppable crying for no apparent reason usually occurring in the evening particularly in the first trimester after birth, sometimes continuing up to the sixth month. Among many definitions of infantile colic, it was defined by Wessel et al. in 1954 to be unexplained and uncontrollable crying spells, beginning in the first weeks of birth, continuing for more than 3 hours a day, more than 3 days a week, and for at least 3 weeks (Jarman & Sewell, 2000).

It is common for infants to have a high level of crying in the three months after birth. This condition is referred to as normal crying and can reach up to three hours a day towards the end of the eighth week (Orhon, 2016). While these cries turn into a learning situation as the needs of the infant are met, it becomes easier for parents to manage this process through various coping methods (Mutlu et al., 2020). However, infant cries have various forms in the colic process. Infants may knit eyebrows, pull legs, clench fists, have red faces, and produce intense gas when crying (Hjern et al., 2020; Zeevenhooven et al., 2018). Colic occurs in the form of attacks and usually begins when the infant is two weeks old and reaches its maximum level in the sixth week. It also disappears significantly after the sixth month (Cocker et al., 2015; Hjern et al., 2020; Zeevenhooven et al., 2018).

INCIDENCE OF INFANTILE COLIC

It is reported that the incidence of infantile colic in the whole world is between 10-40% (Akhnikh et al., 2014). The incidence of infantile colic was found to be 3 to 28% in prospective studies and 8 to 40% in retrospective studies (Orhon, 2016). In Turkiye, the number of studies focusing on the frequency of colic is limited. When some of these limited studies are examined, it was seen that the frequency of infantile colic is 16.6% according to Yalçın et al. (2010), 51.1% in a regional study of Karaca Çiftçi and Arıkan (2007) and 75% in the colic screening of 6-9-month-old infants by Karabel et al. (2010). International studies on outpatient clinic

applications determined that 17% of parents with infants younger than three months visited outpatient clinics because of excessive crying (Akhnikh et al., 2014; Roberts et al., 2004).

ETIOLOGY OF INFANTILE COLIC

There are several studies on the etiology of infantile colic (Akhnikh et al., 2014; Mai et al., 2018; Şimşek Orhon, 2016; Perry et al., 2019). Although the exact cause is unknown, etiological factors of infantile colic are categorized as gastrointestinal causes, neurodevelopmental causes, and psychosocial causes.

GASTROINTESTINAL CAUSES

Problems related to the gastrointestinal system were previously stated to occur due to the pressure exerted by the gas in the intestines on the intestinal wall and by the resulting tension (Ellet, 2003; Karabayır & Oğuz, 2009). However, there are studies revealing that the intestinal structure of infants with and without infantile colic symptoms is similar (Iacovou et al., 2012 Roberts et al., 2004; Tormo et al., 2001). Therefore, gastrointestinal causes gained a new dimension beyond routine symptoms and were re-examined in five categories including infant-oriented feeding, food allergy, gastrointestinal hormones, lactose malabsorption, and gastroesophageal reflux with a new approach (Ellet, 2003; Karabayır & Gökçay, 2017). Although these studies underline that increased gas is not the cause of colic, it is also stated that there are studies suggesting that intestinal gas is the first cause of crying (Karabayır & Gökçay, 2017).

Likewise, studies on nutrition and food allergy could not reveal definitive symptoms where the said allergy causes pain in infants. However, studies conducted to determine the difference between normal formulas and hydrolyzed formulas found that the use of hydrolyzed formulas reduces the colic pains of infants (Saavedra et al., 2003). The rejected hypotheses also include the risk of colic due to disorders in carbohydrate absorption and problems with lactose digestion (Kanabar et al., 2001). In an experimental study, a formula with lactose content was given to

infants with colic who were fasted and the hydrogen gas in their breath was measured. Although higher levels of hydrogen gas were observed in infants without colic, no positive effect was observed in lactose-free feeding (Akçam, 2004; Balcı, 2006).

NEURODEVELOPMENTAL CAUSES

In the period following the birth of infants, intestinal receptors are more sensitive to intestinal activities due to the structure of their nervous system. Therefore, even normal contractions may be felt as pain by infants. This can be observed in infants as behaviors resembling colic symptoms (Balcı, 2006; Akçam, 2004).

Another view is that colic is caused by the hormonal activities of the infant during the growth process. Hormone activities play a role in the contraction of muscles. Hormones, which become active particularly at the end of the day and in the dark, begin to take effect after the third month in the infant's growth process. The absence of an element to suppress the hormone serotonin until this period is considered to be the main cause of contractions (Halpern & Coleho, 2016). In a related study, it was stated that the serotonin level and cortisone level in the urine of infants with colic were higher than those of normal infants (Halpern & Coleho, 2016). At this point, it was stated that the third and ninth months are the most remarkable periods (Karabayır & Gökçay, 2017). In these months, the crying attacks are intense, and the diagnosis of colic cannot be made until the sleep pattern is established. It is stated that colic infants in these months show more sensitivity to stimuli due to abnormal balance of the immature nervous system (Ellet et al., 2003).

PSYCHOSOCIAL FACTORS

The period of pregnancy and thereafter is very important with regard to the formation of infantile colic. Particularly, the parent-infant relationship is referred to be a determining factor in infantile colic since cases like anxiety, trauma, stress, etc. are directly reflected in the infant (Sabuncuoğlu & Berkem, 2006). Although this is stated to be important, it is also reported that

there is uncertainty in terms of cause-and-effect relationships (Iacovou et al., 2012; Talachian et al., 2008).

Factors that are effective on maternal psychology after birth can be listed as the mother's temperament, sexual life, sense of trust, experience, problems during the breastfeeding period, father's attitude towards mother and infant, etc. (Balcı, 2006). The character and temperament of not only the mother but also the infant is effective on infantile colic (Turner & Palamountain, 2015). It can be said that the crying syndromes of sensitive, difficult, and overreactive infants are more dominant (Akçam, 2004).

In some studies, investigating the effects of psychological factors on colic, it was determined that the mothers of infants with colic had a high level of depression, and the breastfeeding period was relatively shorter in mothers of infants with colic (Akman et al., 2006; Cohen & Albertini, 2012; Herman & Le, 2007).

DIFFERENTIAL DIAGNOSIS OF INFANTILE COLIC

Infantile colic can be identified after investigating other causes of crying. It is reported that only 5.1% of infants with crying complaints have an underlying serious organic lesion. Other causes should be investigated in the presence of growth retardation or pathological symptoms in physical examination (Table 1) (Karabayır & Gökçay, 2017).

Table 1

Differential Diagnosis of Infantile Colic

The Types of the Diagnosis
Nutritional mistakes (hunger/improper preparation of formula milk)
Neonatal withdrawal syndrome
Skin lesions (hair entanglement on finger or penis, rash, trauma)
Eye (corneal abrasion, glaucoma, foreign body in the eye)
Cardiac (supraventricular tachycardia, heart failure)
Gastrointestinal system (food allergy, GER, anal fissure, volvulus, invagination, gastroenteritis)
Genitourinary system (urinary system infection, meatal ulcer, testicular torsion, inguinal hernia)
Neurological (head trauma, CNS anomaly/disorder)
Skeletal system (fracture, osteomyelitis)
Vaccine administration
Abuse

TREATMENT OF INFANTILE COLIC

There is no clear conclusion about colic yet as it is still controversial whether the signs and symptoms are caused by a disease or are part of a development process. However, both the infant and the parents are adversely affected in both cases. Therefore, there is a natural expectation for a treatment or coping method. At this point, there may be preferences such as medical treatment, dietary changes, behavioral methods, and herbal applications (Kheir, 2012; Savino et al., 2013).

MEDICAL TREATMENT

The drugs recommended in the treatment of colic are anticholinergic agents, simethicone, and antacids (Akçam, 2004; Savino & Tarasco, 2010). Although these drugs are recommended and used, it cannot be said that they provide a permanent solution. Anticholinergic agents are drugs that provide relief due to relaxation of intestinal muscles. Dicyclomine and dicycloverin stand out in this group. However, it was reported that these drugs also have serious side effects (difficulty in breathing, coma, etc.). Dicyclomine is known to cause side effects including

paralysis, asphyxia, fainting, difficulty in breathing, coma, and muscular hypotonia. Although these side effects occur rarely, it is stated that the use of drugs in the treatment of infantile colic without serious clinical studies and without somatic results is quite risky (Ellwood et al., 2020). Therefore, the use of these drugs is avoided in order not to pose a risk (Alagöz, 2013; Akçam, 2004; Cohen Silver & Ratnapalan, 2009; Kheir, 2012). It is stated that simethicone group drugs have no contribution when evaluated with the placebo effect (Yalaz, 2003).

DIETARY CHANGE

It was reported that the cause of colic in infants during the breastfeeding period is cow's milk protein, soy, hazelnut, legumes, peanuts, spicy foods, etc. transferred from mother to milk (Landgren et al., 2011; Yalçın & Kuşkonmaz 2011). If the infant with colic is fed only by breast milk, dietary change is not recommended due to the protective feature of breast milk (Karabayır & Oğuz, 2009). For formula-fed infants, hypoallergenic formula is recommended for two weeks. However, the most important point to be considered is the necessity of a thorough examination of the formula content, avoiding frequent formula changes (Roberts et al., 2004). In dietary treatment, there are studies on the intake of some probiotics into the diet (Szajewska & Dryl, 2016). The positive effect of probiotic use on the intestines was revealed in a study (Savino et al., 2013).

BEHAVIOURAL TREATMENT

Another important treatment method is behavioral treatment. The relaxing effect of these practices was demonstrated in many studies (Alagöz, 2013; Büyükgedikli, 2016; Kheir, 2012; Savino et al., 2013). Among them, the most important one is the 5 S. 5 S refers to swaddling, side or stomach, sound, swinging, and sucking (Savino et al., 2013). In addition, holding the infant in the lap, taking for a stroll, rocking in the cradle, laying on the mother's side or chest, keeping away from stimuli, and white noise listening methods such as the sound of a hair dryer or washing machine relax the infant and lead to shorter crying times (Yalaz, 2003). However,

considering that every infant is special, choosing the infant-specific applications should be considered to be an important detail (Karabayır & Oğuz, 2009).

Behavioral methods are a very common form of treatment (Karaca Çiftçi & Arıkan, 2007). For example, it is stated that there is an inverse relationship between holding time and crying time beginning from 6 weeks of age (Roberts et al., 2004). Again, there are other findings in the literature that the swaddling method has a relaxing effect on colic (Van Slauwen et al., 2007), and that massage allows the infant to relax (Çetinkaya, 2007). Table 2 includes some of the behavioral methods used by mothers for colic in Türkiye (Karabayır & Oğuz, 2009).

Table 2

Behavioral Methods that Mothers apply to Their Infants during Colic

The Type of the Behavioral Methods
Rhythmically rocking the infant in the lap, pushchair, cradle, or hammock
Taking a stroll with a stroller or car
Taking the infant on the lap and leaning on the chest, applying small strokes on the back gently and intermittently
Swaddling the infant
Applying a hot towel on the belly
Giving the infant a warm bath
Humming or playing a melody that the infant likes
Take advantage of the rhythmic sounds of vehicles such as fans, vacuum cleaners, hair dryers, and washing machines.
Giving the infant a pacifier
Massaging the infant
Laying the infant face down

HERBAL APPLICATIONS

Herbal applications are among the used methods and are considered important in the treatment of colic. Although the diversity of herbs varies between countries, herbs such as dill, ginger, lemon, licorice, cinnamon, mint, fennel, and yarrow are used to relieve colic pain due to their antispasmodic properties (Crotteau et al., 2006; Kheir, 2012; Yakut & Tunç, 2007).

Since herbal applications are among the most frequently used methods, their traditional use is common in our society (Ateş & Güngör, 2021).

There are some studies in the literature on herbal methods in infants with colic. Some of these studies reported that types of herbal tea reduce colic symptoms by 58.0% (Herman & Le, 2007; Wade & Kilgour, 2001). In the study of Yiğit and Derebent (2006), it was determined that herbal applications reduced colic symptoms by 66.0%. However, attention should be paid to the amount, type, and application method of the herb in herbal applications (Çakmak, 2011) since the herbs in question may also have undesirable side effects (diarrhea, iron absorption, etc.) along with their therapeutic properties. Studies on direct use in infants are limited in terms of their form of use (Yiğit & Derebent, 2006). In a study, it is reported that the recommended use of the oil of the Salvia officinalis herb, known as sage, in infants is in the form of application on the skin. It is stated that the oral use of this herb results inthe child experiencing neurological problems and may require to receive oxygen therapy (Arıca et al., 2012). Similarly, it was reported that the infants were put under observation due to the misuse of bitter apple oil, but no complications were observed (Gündüz et al., 2016).

EFFECTS OF INFANTILE COLIC ON PARENTS

Due to the negative effects of colic on both the infant and family members, this process is quite wearisome (Gordon et al., 2019). It was reported that particularly mothers have high rates of depression and anxiety due to problematic relationships with their infants which negatively affects their family processes as well (Lam et al., 2019; Sung 2018; Twomey et al., 2012; Vik et.al., 2009; Zeevenhooven et al., 2018). Significant behavioral problems may occur in the infant's sleep, rest, and feeding due to frequent and prolonged crying spells (Hjern et al., 2020; Uysal et al., 2017; Zeevenhooven et al., 2018).

Along with the infant, the mother may experience helplessness, fatigue, insomnia, concentration disorder, exhaustion, loss of self-confidence, feelings of inadequacy, anxiety, and

breastfeeding problems (Çelik, 2016). Studies found that there is a relationship between colic and marital problems, parents' perception of stress, parents' lack of self-confidence during pregnancy, dissatisfaction with birth, and family stress levels (Gordon et al., 2019; Zeevenhooven et al., 2018). In today's circumstances, the prevention of diseases and accidents in terms of child nursing, the holistic approach (holistic evaluation of body, mind, and mental health) in health care services, and the care of the child in the family became a focal point (Çavuşoğlu, 2004).

NURSING APPROACH IN INFANTILE COLIC

Considering infantile colic to be a difficult process, it is inevitable for families to be affected by it. Therefore, getting support from a health personnel or health institution is extremely important as it ensures a smoother process (Herman & Le, 2007; Florence et al., 2008; Twomey et al., 2012).

The effect of this condition, which will be evaluated within the expanding scope of the duty of children’s health nurses, is very important both in the family and outside the family in terms of preventive practices (Çalbayram et al., 2017; Urbanska & Szajewska, 2014).

The treatment of infants, parent meetings, ensuring the flow of information, and reducing anxiety are important for achieving a smoother process (Vatandaş, 2004). The nurse should support family members in managing the stress experienced by the family in the process of coping with colic, explain methods to increase self-confidence and inform about methods to reduce the duration and severity of colic (Lam et al., 2019). In addition, the nurse should support the parents of the infant with infantile colic and help with comforting methods when necessary (Çelik, 2016; Gordon et al., 2019; Lam et al., 2019; Zeevenhooven et al., 2018). Nurses should support parents in planning their rest times and in activating their social support. Having a strong support system during this period is essential for their social, psychological, and physical health (Gordon et al., 2019; Lam et al., 2019).

CONCLUSION

Infantile colic causes families to experience very difficult times and they need supportive resources in this difficult process. Particularly, families who receive support from pediatric nurses can get through this process more easily. Here, the importance of the services provided by children's health nurses in the relevant approaches can be emphasized once again in terms of their scope of duty. Regardless of the circumstances, the process is very difficult for both infants and parents. Under this condition, various choices arise in terms of treatment or management of the process. Therefore, it is considered to be extremely important to get help from health institution and health personnel. It should be known that there is no direct treatment of colic, but its effects on both the baby and the parents can be relatively alleviated. It is very important to inform parents that this process should go smoothly and without any problems and to raise awareness of this issue.

AUTHOR CONTRIBUTION

Idea/concept: SBD, SYA; Design: SBD, SYA; Consultancy: SBD, SYA; Data collection: SBD, SYA; Data Processing: SBD, SYA; Analysis and/or Interpretation: SBD, SYA; Literature review: SBD, SYA; Writing of the article: SBD, SYA; Critical review: SBD, SYA

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

FINANCIAL DISCLOSURE

This study has not been financed by any institutional organization.

PEER REVIEWED

Externally peer-reviewed.

REFERENCES

Akçam, M. (2004). İnfantil kolik, *Sted, 13*(2), 66-67.

Akman, I., Kuşçu, K., Özdemir, N., Yurdakul, Z., Solakoglu, M., Orhan, L., Karabekiroğlu, A., & Özek, E. (2006). Mothers' postpartum psychological adjustment and infantile colic. *Archives of Disease in Childhood, 91*(5), 417-419.

Akhnikh, S., Engelberts, A.C., Van Sleuwen B.E., L'Hoir M.P., & Benninga, M.A. (2014). The excessively crying infant: Etiology and treatment. *Pediatrics Annals, 43*(4), 69-75.

Alagöz, H. (2013). Infantile colic: Etiology and treatment options. *Journal of Contemporary Medicine, 3*(2), 148-154.

Arıca, V., Arıca, S., Tutanç, M., Motor, S., Motor, V. & Doğan, M. (2012). Convulsion in infants due to oral use of sage oil. *Turkish Pediatrics Archive, 47*(1), 67-78. https://doi.org.10.4274/tpa.1170

Ateş, S., & Güngör, A. (2021). Evaluation of pediatricians' knowledge and attitudes regarding traditional and complementary medical treatment practices. *Van Journal of Health Sciences, 14*(1), 7-18. https://doi.org.10.52976/vansaglik.752863

Balcı, S. (2006). *The effect of white noise on babies with colic*. (Publication No. 193519) [Master's Thesis, Marmara University]. Council of Higher Education National Thesis Center.

Büyükgedikli, F. (2016). *Relationship between plasma magnesium levels and infantile colic*. (Publication No. 417442) [Medical Specialization Thesis, Erciyes University]. Council of Higher Education National Thesis Center.

Cocker, K., Chang, E. & Johnson, J. (2015). Infantile colic: Recognition and treatment. *American Family Phyisician, 92*(7), 577-582.

Cohen, G.M., & Albertini, L.W. (2012). Colic. *Pediatrics in Review, 33*(7), 332-333.

Cohen Silver, J., & Ratnapalan, S. (2009). Management of infantile colic: a review. *Clinical Pediatrics, 48*(1), 14-17.

Crotteau, C.A., Wright, S.T., & Eglash, A. (2006). Clinical inquiries. What is the best treatment for infants with colic. The *Journal of Family Practice, 55*(7), 634-636.

Çakmak Y.O. (2011). Infantile colic: exploring the potential role of maternal acupuncture. *Acupuncture in medicine: Journal of the British Medical Acupuncture Society*, *29*(4), 295–297. https://doi.org/10.1136/acupmed.2011.010065

Çalbayram, N.Ç., Altundağ, S., & Aydın, B. (2017). Traditional practices that nurses encounter with pediatric patients. *Sted, 26*(1), 27-31.

Çavuşoğlu, H. (2004). *Çocuk sağlığı hemşireliği*. Sistem Ofset Basımevi.

Çelik, M.Y. (2016). Infantile colic and nursing approaches. *Türkiye Clinics Journal of Nursing Sciences*, *8*(4), 335-342.

Çetinkaya, B. (2007). *Examining the effect of aromatherapy massage on relieving colic in infants*. (Publication No. 224690) [Doctoral thesis, Ege University]. Council of Higher Education National Thesis Center.

Ellet, M. (2003). What is known about infant colic. *Gastroenterology Nursing*, *26*(2), 60-65.

Ellwood, J., Draper Rodi, J., & Carnes, D. (2020). Comparison of common interventions for the treatment of infantile colic: A systematic review of reviews and guidelines. *BMJ Open*, *10*(2), e035405.

Florence, Z., O'Connel, A., Lockwood, C., & Thomas, P. (2008). The effectiveness of interventions for infant colic: Technical report. *The Joanna Briggs Institute, 4*(6), 65-74.

Gordon, M., Gohil, J., & Banks, SS. (2019). Parent training programmes for managing infantile colic. *The Cochrane Database Systematic Review, 12*(12), CD012459. https://doi.org/10.1002/14651858.CD012459.pub2

Gündüz, S., Kara, S., Yüksel, Ç., & Yılmaz A. (2016). Four poisoning cases due to misuse of bitter apple oil. *Dicle Medical Journal, 43*(2), 364-366.

Halpern, R., & Coleho, R. (2016). Excessive crying in infants. *Jornal de pediatria*, *92*(3 Suppl 1), S40–S45. https://doi.org/10.1016/j.jped.2016.01.004

Herman, M., & Le, A. (2007). The crying infant. *Emergency medicine clinics of North America*, *25*(4), 1137–vii. https://doi.org/10.1016/j.emc.2007.07.008

Hjern, A., Lindblom, K., Reuter, A., & Silfverdal, S.A.A. (2020). Systematic review of prevention and treatment of infantile colic. *Acta paediatrica, 109*(9), 1733–1744. https://doi.org/10.1111/apa.15247

Iacovou, M., Ralston, R. A., Muir, J., Walker, K. Z., & Truby, H. (2012). Dietary management of infantile colic: a systematic review. *Maternal and Child Health Journal*, *16*(6), 1319–1331. https://doi.org/10.1007/s10995-011-0842-5

Jarman, R., & Sewell, J. (2000). Common Behavioral and Developmental Problems. In K. Harding, D.S. Mason, & D. Efron (Eds.), *Paediatric Handbook* (pp. 144-145). Blackwell.

Kanabar, D., Randhawa, M. & Clayton, P. (2001). Improvement of symptoms in infant colic following reduction of lactose load with lactase. *Journal of Human Nutrition and Dietetics, 14*(5), 359–363. https://doi.org/10.1046/j.1365-277x.2001.00304.x

Karabayır, N., & Oğuz, F. (2009). Infantile colic. *Journal of Children's, 9*(1), 16-21.

Karabayır, N., & Gökçay, G. (2017). A new look at the old problem: infantile colic. *Journal of Children's*, *17*(2), 53-60.

Karaca Çiftçi, E., & Arıkan, D. (2007). Methods used to eliminate colic in infants in the eastern parts of Turkey. *Public Health Nursing, 24*(6), 503-510.

Karabel, M., Karabel, D., Tayman, C., Tonbul, A., & Tatlı, M.M. (2010). Evaluation of risk factors and pharmacological treatment approaches in infantile colic. *Turkish Journal of Pediatric Diseases, 4*(1), 12-17.

Kheir A. E. (2012). Infantile colic, facts and fiction. *Italian journal of pediatrics, 38,* 34. https://doi.org/10.1186/1824-7288-38-34 (Retraction published Ital J Pediatr. 2014 Mar 11;40(1):9. https://doi.org/10.1186/1824-7288-40-9)

Lam, T. M. L., Chan, P. C., & Goh, L. H. (2019). Approach to infantile colic in primary care. *Singapore Medical Journal*, *60*(1), 12–16. https://doi.org/10.11622/smedj.2019004

Landgren, K., Kvorning, N., & Hallström, I. (2011). Feeding, stooling and sleeping patterns in infants with colic - a randomized controlled trials of minimal acupuncture. *BMC Complementary and Alternative Medicine, 11,* 93. https://doi.org/10.1186/1472-6882-11-93

Mai, T., Fatheree, N. Y., Gleason, W., Liu, Y., & Rhoads, J. M. (2018). Infantile Colic: New Insights into an Old Problem. *Gastroenterology clinics of North America*, *47*(4), 829–844. https://doi.org/10.1016/j.gtc.2018.07.008

Mutlu, B, Erkut, Z., Şerife, A., Girgin, S.S., & Gönen, İ. (2020). The practices used by mothers to ınfantile colic and their perceptions on the benefits of the practices. *Online Turkish Journal of Health Sciences, 5*(1), 8-16.

Orhon, F.Ş. (2016). Current approaches to the diagnosis and treatment of infantile colic. *Ankara University Faculty of Medicine Journal, 69*(3), 159-166.

Perry, R., Leach, V., Penfold, C., & Davies, P. (2019). An overview of systematic reviews of complementary and alternative therapies for infantile colic. *Systematic Reviews, 8*(1), 271. https://doi.org/10.1186/s13643-019-1191-5

Roberts, D.M., Ostapchuk, M., & O'Brien J.G. (2004). İnfantile colic. *American Family Physician, 70*(4), 735-741.

Saavedra, M.A.L., Dias da Costa, J.S., Garcias, G., et al. (2003). Infantile colic incidence and associated risk factors: A cohort study. *Jornal De Pediatria, 79,* 115-122.

Sabuncuoğlu, O., & Berkem, M. (2006). The relationship between attachment style and postpartum depression symptoms: Findings from Turkey. *Turkish Journal of Psychiatry (Electronic Journal), 17*(4), 252-258.

Savino, F., Benetti, S., & Ceratto, S. (2013). Infantile colic: from symptoms to diagnosis – A practical approach. *Journal of Symptoms and Signs 2,* 248-252.

Savino, F., & Tarasco, V. (2010). New treatments for infant colic. *Current opinion in pediatrics, 22*(6), 791–797. https://doi.org/10.1097/MOP.0b013e32833fac24

Sung, V. (2018). Infantile colic. *Australian Prescriber, 41*(4), 105-110.

Szajewska, H., & Dryl, R. (2016). Probiotics for the management of ınfantile colic. *Journal of Pediatric Gastroenterology and Nutrition, 63,* S22–S24. https://doi.org/10.1097/MPG.0000000000001220

Şimşek Orhon, F. (2016). Current approaches to the diagnosis and treatment of infantile colic. *Ankara University Medical Faculty Journal, 69*(3), 159-166.

Talachian, E., Bidari, A., & Rezaie, M.H. (2008). Incidence and risk factors for infantile colic in Iranian infants. *World Journal of Gastroenterology, 14*(29), 4662-4666.

Tormo, R., Bertaccini, A., Conde, M., Infante, D., & Cura, I. (2001). Methane and hydrogen exhalation in normal children and in lactose malabsorbstion. *Early Human Dev*elopment*, 65,* 165-172. https://doi.org/10.1016/s0378-3782(01)00219-5

Turner, TL., & Palamountain, S. (2018) *Infantile colic: Clinical features and diagnosis.* https://www.uptodate.com/contents/infantile-colic-clinical-features-and-diagnosis

Turner, T.L., & Palamountain, S. (2015). *Infantile colic: Clinical features and diagnosis.* https://www.uptodate.com/contents/infantile-colic-clinical-features-and-diagnosis

Twomey, J. E., High, P., & Lester, B. M. (2012). Colic: What's maternal mental health got to do with it? *Infant Mental Health Journal, 33*(5), 543–552. https://doi.org/10.1002/imhj.21344

Urbanska, M., & Szajewska, H. (2014). The efficacy of Lactobacillusreuteri DSM 17938 in infants and children: a review of the current evidence. *European Journal of Pediatrics, 173*(10), 1327–1337. https://doi.org/10.1007/s00431-014-2328-0

Uysal, G., Düzkaya, D.S., & Bozkurt, G. (2017). Factors affecting babies with infantile colic. *Archives of Health Science and Research, 4,* 221-227. https://doi.org/10.17681/hsp.322539

Van Slauwen, B.E., Engelberts, A.C., Boere-Boonekamp, M.M., Kuis, W., Schulpen, T.W.J., & L'Hoir P. (2007). Swaddling: A systematic review. *Pediatrics,* 120, e1097-e1106.

Vatandaş, N. (2004). Suggestions for families on baby care. *Sted, 13*(1), 6–8.

Vik, T., Grote, V., Escribano, J., Socha, J., Verduci, E., Fritsch, M., Carlier, C., von Kries, R., Koletzko, B., & European Childhood Obesity Trial Study Group (2009). Infantile colic, prolonged crying and maternal postnatal depression. *Acta Paediatrica, 98*(8), 1344–1348. https://doi.org/10.1111/j.1651-2227.2009.01317.x

Wade, S., & Kilgour, T. (2001). Extracts from "clinical evidence": Infantile colic. *BMJ (Clinical research ed.), 323*(7310), 437–440. https://doi.org/10.1136/bmj.323.7310.437

Wessel, M.A., Cobb, J.C., Jackson, E.B., Harris, G.S., & Detwiler, A.C. (1954). Paroxysmal fussing in infancy, sometimes called colic. *Pediatrics, 14*(5), 421–435.

Yakut, H.İ., & Tunç, B. (2007). Infantile colic. *Turkish Journal of Pediatric Diseases, 1*(1), 58-64.

Yalaz, M. (2003). Examination of infantile colic treatment models. *Türkiye Clinics: Pediatrics, 12*(3), 206-210.

Yalçın, SS., & Kuşkonmaz, BB. (2011). Relationship of lower breastfeeding score and problems in infancy. *Breastfeeding Medicine, 6*(4), 205-208.

Yalçın, S.S., Örün, E., Mutlu, B., Madendağ, Y., Sinici, İ., Dursun, A., Özkara, H.A., Üstünyurt, Z., Kutluk, Ş., & Yurdakök, K. (2010). Why are they having infant colic? A nested case–control study. *Paediatric and Perinatal Epidemiology, 24*, 584-596. https://doi.org/10.1111/j.1365-3016.2010.01150.x

Yiğit, R., & Derebent, E. (2006). Pain in the newborn: assessment and management. *Journal of Cumhuriyet University School of Nursing, 10*(2), 41-48.

Zeevenhooven, J., Browne, P. D., L'Hoir, M. P., de Weerth, C., & Benninga, M. A. (2018). Infant colic: mechanisms and management. *Nature reviews. Gastroenterology & Hepatology*, *15*(8), 479–496. https://doi.org/10.1038/s41575-018-0008-7