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NEWBORN AND INFANT ABDOMINAL COLIC: RELIEF STRATEGIES

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ABSTRACT

Objectives: To identify colic relief strategies in newborns and infants.

Methodology: An integrative/systematic review was performed using the PICO method to elaborate the guiding subject. A survey was conducted on the B-on and in the EBSCOHost® data aggregator, databases during the months of September and October 2017. Qualitative and quantitative studies, that address the strategies of relief of colics in newborns and infants up to 6 months, published in Portuguese, English and Spanish between 2011 and 2017 were included. Five articles were selected based on a pre-defined inclusion and exclusion criteria, followed by analysis with Joanna Briggs Institute's approach.

Results: Strategies for the relief of abdominal colic in newborns and infants were found upon the conclusion of the analysis.

Conclusions: It is evidenced by the results extracted that the relief strategies studied were the use of symbiotics, probiotics and complementary therapies.

Descriptors: Newborns; infants; colic.

INTRODUCTION

Colic in newborns and infants are characterized by abdominal pain that manifests by excessive, sudden crying followed by irritability, and leg retraction over the abdomen[1]. They affect newborns and infants and happen between the first two weeks and four months of life[2-3]. Colic usually appears in 8% to 40% of newborns and infants; colic is not related to gender, race, gestational age, breastfeeding or feeding using adapted milk, and social-economical level[1-2].

Diagnostics is generally made using the Wessel's "rule of threes" that is defined by intense crying for more than 3 hours a day for more than 3 days a week for more than three weeks[2-3]. Some infants experience more symptoms during the evening or beginning of the night[1].

Colic etiology is usually unknown, but according to multiple studies there are some factors that may trigger colic. These can be of gastrointestinal, biological or psychosocial origin[1-2]. Gastrointestinal factors include hyper feeding, feeding that is too fast, immature central nervous system, neurochemical deregulation of the brain, allergy to cow milk protein, lactose intolerance, immature bowels, increase in bowel motility, and increase in

fecal microflora. Biological factors include incorrect feeding techniques with increased air deglutition; intestinal motor activity that is hard to regulate; parents who smoke. Psychosocial habits include maternal depression, hyper stimulation and family anxiety[2-3].

Prognosis is favorable. This problem is usually solved by 4 months, and does not affect infant growth and development[1-2].

Constant, intense crying in a newborn or infant who experiences colic is stressful and may cause parents to shake the child to make the child stop crying. But this behavior, repeated by parents, can affect the baby seriously, as it may cause traumatic brain injury[1]. This way, it is very important to outline strategies to prevent and mitigate colic in newborns and infants. This will allow for children comfort and connection with their parents, while meeting the goal of this study that is to learn about the multiple abdominal colic relief strategies in the target-group.

METHODOLOGY

The methodological quality of evidence-based nursing is a way to apply the best clinical research published. This practice supports decision making in terms of care to provide that is based on the best scientific results originated from primary research[4].

Considering the defined goal, the PICO mnemonic was used to guide the elaboration of the research question: **What are the strategies for abdominal colic relief in newborns and infants?**

The Health Sciences descriptors below (DeCS edition 2017)[5] were used to search the B-on and EBSCOHost® data aggregators (including all databases from the latter): *Colic*, *Newborn* and *Infant*, and the search included the intersection of each descriptor by using the Boolean operator "and".

Full text articles published between 2011 and 2017 in Portuguese, English and Spanish were defined as search delimiters.

Inclusion criteria were: articles that addressed abdominal colic in newborns; articles that addressed abdominal colic in infants up to 6 months; strategies used for abdominal colic relief; qualitative and quantitative studies.

Exclusion criteria were: articles that included children older than 6 months; articles that did not address abdominal colic relief strategies; articles that did not address colic prevention strategies.

Four researchers have searched the databases independently during September and October 2017. Search results were compared. The researchers agreed on how to solve disagreements in order to include as many studies as possible.

Seventy-seven articles were found in EBSCOHost® and two hundred and five in B-on using the health descriptors selected and considering the search delimiters. Thirty-one articles (15 from EBSCOHost® and 16 from B-On) were then selected after a careful reading and exclusion of repeated articles. Twenty articles (10 from EBSCOHost® and 10 from B-On) were excluded after a detailed analysis and reading of abstracts, because they were either incomplete, literature reviews, systematic reviews (that showed past evidence with more than 30 years) or ongoing studies (i.e. that showed no results.) From the 11 articles that were selected, 5 (4 from EBSCOHost® and 1 from B-On) were excluded according to the exclusion criteria defined. In the end, 6 articles met the delimited inclusion criteria. The following diagram (*Prisma 2009 Flow Diagram*)[6] shows a brief description of article exclusion and the path that led to the selection of those 6 articles (Figure 1).

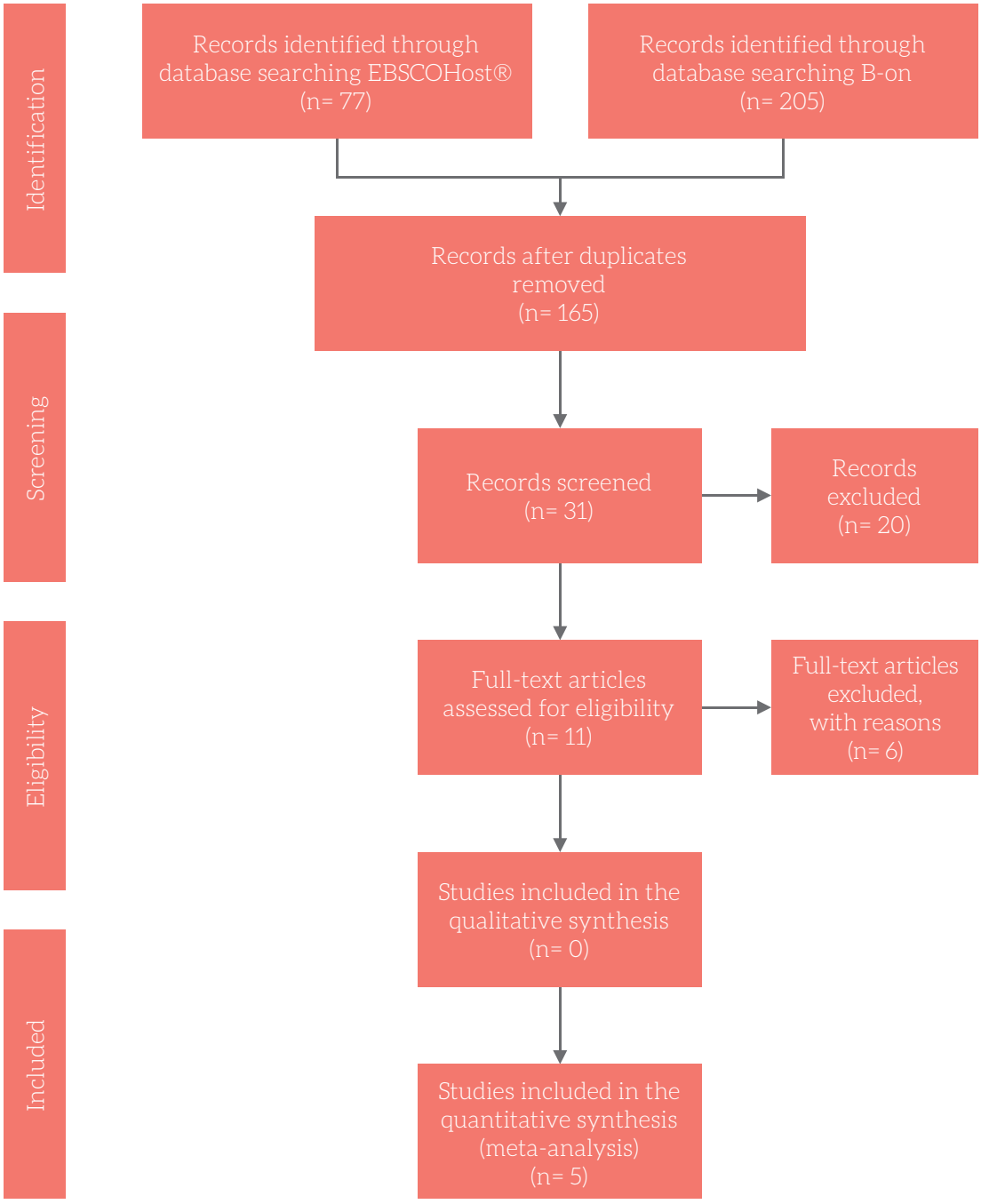

Figure 1 – Selection of studies in databases.

The methodological quality of the studies was analyzed after selecting the articles according to the inclusion and exclusion criteria. Given the scientific production in the health sector, this evidence-based research is vital to optimize knowledge, both in practical and research terms. Reviewing research is a way to optimize what is already described[7]. Joanna Briggs Institute[8] (JBI) referred that evidence-based health care were viable, ade-

quate and effective. Current health care needs are based on the generation of research evidence. When this evidence is collected, results are analyzed, summarized and then taken into health care provision, where healthcare professionals assess how they affect professional practice[8].

The corresponding JBI grid was applied to each type of study (article). The systematic review included all studies with less than 50% of items included in the JBI grid, therefore showing methodological quality. From the 6 articles above, only 5 showed methodological quality after the JBI grid analysis.

RESULT EXTRACTION AND DISCUSSION

From the studies described in articles found in research that were considered to have methodological quality (5 studies), one was published in the *Scandinavian Journal Of Primary Health Care*[9] (impact factor of 1.726 in 2016), two in *The Journal Of Pediatrics*[10-11] (impact factor of 3.874 in 2016 and Qualis (CAPES)[12]-A2), one in the *Journal of Paediatrics and Child Health*[13] (impact factor of 1.572 in 2016 and Qualis (CAPES)[12] - B2), and one in the *Iranian Journal Of Neonatology*[14] (Qualis (CAPES)[12] - B4).

Studies included in this review were made between 2009 and 2016 (study intervals.) One article was published in 2013[9], one in 2014[13], two in 2015[10,14] and one in 2017[11]. From the five studies, four were Randomized studies[9-11,13] and one was a Quasi-Experimental study[14]. Data collection instruments were: a structured diary[9-11,13], interview[9], lab results[11], clinical observation[11], and surveys[14]. Study participants included healthy newborns and infants younger than 6 months.

Table 1 shows the data collection instrument used to obtain data from analyzed articles, along with objectives, evidence level [EL] according to the JBI, interventions and results from study authors.

Table 1 – Data collected from analyzed studies.

Study identification/ Evidence Level	Study goal	Interventions or phenomena of interest	Results
A1 "Acupuncture for infantile colic: A blinding-validated, randomized controlled multicentre trial in general practice" (Skjeie H, Snonnord T, Fetveit A, Brekke M. (2013)[9] NE – 1.c	Determine the effectiveness of acupuncture in abdominal colic treatment.	Divided into 2 groups. Group 1: acupuncture needle inserted in acupuncture point for 30 seconds. Group 2: no needle inserted in pre-defined point.	The crying of newborns and infants who received acupuncture was reduced in 13 minutes when compared to the newborns and infants who received no acupuncture.
A2 "*Lactobacillus reuteri* for Infants with Colic: A Double-Blind, Placebo--Controlled, Randomized Clinical Trial" Fatheree N. Y., et al. (2017)[11] NE – 1.c	Determine the effectiveness of *Lactobacillus reuteri* DSM 17938 in the treatment of abdominal colic and safety in terms of immune response, microbial variants and bowel inflammation in newborns and infants.	One of the groups was administered with 5 drops of *Lactobacillus reuteri* DSM 17938 daily for 42 days. The other group was administered with 5 drops of placebo daily for 42 days.	At the beginning of the treatment, 11 newborns and infants were showing neutropenia. Such disorder was resolved by day 17, regardless of the administration of *Lactobacillus reuteri* DSM 17938. The administration of *Lactobacillus reuteri* DSM 17938 did not change the crying time and analytical results significantly.
A3 "Synbiotic in the management of infantile colic: A randomised controlled trial" (Kianifar H, Ahanchian H, Grover Z, Jafari S, Noorbakhsh Z, Khakshour A, Sedaghat M, Kiani M (2014)[13] NE – 1.c	Determine the effectiveness of symbiotics in abdominal colic treatment.	One group was administered daily with 1 sachet containing 1 billion CFUs (7 types of probiotics and 1 type of prebiotics). The other group was administered daily with 1 sachet of placebo.	Day 7: Treatment success was higher in the group that took the symbiotics (82.6%) when compared to the group that took the placebo (35.7%.) Symptom resolution was higher in the group that took the symbiotics (39%) when compared to the group that took the placebo (7%.) Day 30: Treatment success was higher in the group that took the symbiotics (87%) when compared to the group that took the placebo (46%.)

Table 1 – Data collected from analyzed studies.

Study identification/ Evidence Level	Study goal	Interventions or phenomena of interest	Results
A4 "Probiotics for Infantil Colic: A Randomized, Double-Blind, Placebo--Controlled Trial Investigating *Lactobacillus reuteri* DSM 17938" (Chau K, Lau E, Greenberg S, Jacobson S, Yazdani-Brojeni, P, Verma, N, Koren G, (2015)[10] NE – 1.c	Determine the effectiveness of *Lactobacillus reuteri* DSM 17938 in abdominal colic treatment.	One group was administeredwith 5 daily drops of placebo and the other with 5 daily drops of the probiotic *Lactobacillus reuteri*.	Crying time and agitation were significantly decreased by day 7 for the group treated with *Lactobacillus reuteri*. After 21 days, crying time (in minutes) and agitation of newborns and infants treated with *Lactobacillus reuteri* had decreased significantly.
A5 "The Effects of Kangaroo Mother Care (KMC) on the Fuss and Crying Time of Colicky Infants" (Rad Z, Mojaveri M, Pasha Y, Ahmadpour-Kacho M, Kamkar A, Khafri S, Hossainnia H, (2015)[14] NE – 3.d	Determine the effects of Kangaroo Mother Care (KMC) on colic relief at home.	During teaching stage, the researcher provided mothers with a special vest to keep their babies in the kangaroo position. This vest had to be used at least for 2 hours a day for 7 days.	Before starting with the KMC, average crying time was 2.21 ± 1.54 h/day. It was reduced to 1.16 ± 1.3 h /day after technique application. There was a significant decrease in crying time for babies who were 15 to 30 days old during the first visit. On the other side, for babies who were 30–45 and 45–60 days old, there was no significant decrease in crying times. Baby gender did not affect the results significantly.

These results show that there are strategies that can be used for abdominal colic relief in newborns and infants.

According to the A1 study, newborns and infants treated with acupuncture saw their crying times reduced in 13 minutes when compared to the group treated with the placebo. However, the authors considered that those 13 minutes were not clinically significant.

The A3 study showed that the daily use of a symbiotic increased the relief of symptoms associated with abdominal colic and that symptoms were resolved in a significant group.

The A4 study showed that the daily use of a probiotic containing *Lactobacillus reuteri* DSM 17938 reduced crying time and agitation for newborns and infants from 3 weeks to 6 months old. When compared to the placebo group, crying time and agitation were reduced in 50% for children treated with the probiotic.

However, the most recent A2 study concluded that such probiotic, despite safe, did not show significant changes in daily crying time for newborns and infants.

According to the A5 study, the Kangaroo method was beneficial to newborns and infants who were 15–30 days old. This study also recommended the use of this technique in association with other relief strategies.

CONCLUSIONS

Abdominal colic incidence rate in newborns and infants is significant. This way, it is extremely important to find colic relief strategies.

The use of multiple abdominal colic relief strategies is beneficial, because an intensely crying baby may affect their carers negatively and create instability.

By analyzing the results obtained, it was possible to find a beneficial strategy for abdominal colic relief (the use of symbiotic therapeutic) that reduced newborn and infant crying time and consequently carer anxiety.

Acupuncture is not a reference strategy when it comes to abdominal colic relief, because benefits are quite reduced, and costs are rather high (considering the Portuguese reality).

The Kangaroo method is not a beneficial strategy for colic relief either, although it should be recommended since it promotes newborn and infant wellness and health as it fosters the connection with their carer.

For all the studies reviewed, minimum age to enter the study was higher than two weeks. This is because abdominal colic starts around this time, as stated in literature[2-3].

A great effort was put into finding evidence that could answer the research question. This goal was achieved, because this systematic review aimed at summarizing the evidence for the practice of quality nursing.

Knowledge dissemination to carers, via health education, about existing, effective strategies for colic relief in newborns and infants that is based in evidence found in this area is vital.

Lastly, the following questions, related to this subject, may be used in further research: in what ways can abdominal colic be prevented in newborns and infants; how effective the simultaneous use of multiple strategies for abdominal colic relief in newborns is.

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