ΣΥΣΤΗΜΑΤΙΚΗ ΑΝΑΣΚΟΠΗΣΗ

Breastfeeding. Advantages – disadvantages and problems: A systematic review

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ABSTRACT

Background: Today, questions arise about breastfeeding benefits, disadvantages, whether the woman's body will return to previous situation, whether the mental capacity of people is increased , whether women with health problems can breastfeed, financial advantages or disadvantages and guidance of new maternal health care providers .

Aim: This is a systematic literature review that investigates the benefits of, risks of, and questions about breastfeeding.

Methods: A literature search was performed in Pubmed for "breastfeeding", "benefits", "benefit" in April 2019. We found a total of 61 studies. A total of 13 studies met our criteria . It included studies in English, French and Greek. It was repeated in May 2020 . 14 new studies were found, 2 of which met our criteria and were included in the final review.

Results: We found results: 1]- showed "a correlation of breastfeeding and benefit" 2]- showed "no correlation of breastfeeding with any benefit" and 3]- identified "studies that recommend interventions". In the positive results we include, an increase in the verbal ability of men who were breastfed, the restoration of the body of breastfeeding women, the saving of health costs, studies that suggest interventions.

Conclusions: Breastfeeding remains important. Positive results were found in the economic benefits, in the restraint of expenses, in the aging process of men, in the return of the figure of women. Negative concerns are related to the diagnostic function, that is not negatively associated with breastfeeding, but simply did not detect a positive outcome associated with all the ages groups.

Keywords: Breastfeeding, benefits, benefit.

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INTRODUCTION

Today, more and more breastfeeding women stop breastfeeding before the end of the first six months of their baby's life.[1] The World Health Organization recommends that infants should be exclusively breastfed for the first 6 months of life.[2] Also, Breast Milk is recommended as the gold standard at WHO level.[3] However, the study of literature raises some questions regarding breastfeeding. Is breastfeeding really that important? Are there any risks associated with breastfeeding? A decision was made: to proceed with this literature review to collect data and come up with results of the benefits, dangers and questions about breastfeeding. After reviewing the literature, we find that the studies fall into three categories. Those who find positive results between breastfeeding and their research question (Billinghton etal.; Rantalainen et al., Schalla et al.; Santacruz-Salas et al.,)[4,5,6,7] Those who recognize the importance of

breastfeeding and even suggest various interventions to highlight the importance of this and suggest how to improve the lives of participants (Mallan et al.; Park et al; Eldridge et al.; Marx et al; Dhakal et al.; Chola et al.; Scott et al.; Wynn et al.;)[3,8,9,10,11,12,13,14] and those that lead to neutral and ambiguous conclusions about the benefits of breastfeeding (Yanql et al,; Lignell et al.;VonStumm & Plomin) [15,16,17] Having identified these three categories, we quote from them and comment on the results.

METHODS

We carried out a literature search in Pubmed using the keywords "breastfeeding", "benefits", "benefit" and we found a total of 61 studies. A total of 13 studies met our criteria and were included in the review. The survey was conducted in April 2019. It included studies in English, French and Greek. The survey was repeated between 1 and 10 May 2020 so that no new significant results were lost. 2 new results were found that met our criteria and were included in our study. Results were excluded that predate a five-year period, ie studies published in April 2014 and earlier. Figure 1 analyzes the exclusion criteria for studies. An exception was made to study the newest results about the benefits or disadvantages of breastfeeding. Using earlier results would make our study inaccurate and anachronistic. Fourteen studies were excluded either due to the title or the summary (either the summary was absent or it was written in Chinese or German or it was irrelevant to the benefits of breastfeeding or the studies had inaccurate results. Four studies were examined but due to inaccurate results are not included in the final review (Total studies 18). From all the results reviewed, studies with comparable results based on original population studies were finally selected for the purpose of practical comparison of results that could only be extracted from cohort studies / prospective studies, cross sectional surveys, randomized trials and research articles. Studies, reviews, original articles, study protocols, case studies, pilot studies, symposiums, which did not offer us any quantitative comparable results were excluded. The 13studies included, are outlined at the end of the manuscript in Table 1. The two studies included after the update of our study are outlined at the end of the manuscript in Table 2. The 15 studies that were finally included addressed the questions a) of whether or not breastfeeding benefits the mother and child in particular with regard to taking medication for the mother's mental health conditions or for taking medication for communicable diseases during pregnancy and lactation, whether breastfeeding benefits the mother's diet and figure, whether it benefits the mother's health and finally whether there are economic benefits b) It also addresses

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what kind of interventions are recommended to deal with the problems mentioned above in point a) and c) Finally the review also addresses cases where there are no positive signs in favor of breastfeeding.

RESULTS

Studies linking breastfeeding to positive effects:

This is the first study by Billinghton et al.,[4] who observed infants attending their tongue-tie clinic achieved both higher exclusive breastfeeding and combined breast and bottle-feeding when compared to national breast-feeding data at 3months of age. This can facilitate the achievement of long-term breastfeeding, exposing infants and mothers to many of the associated benefits. In the prospective study, 100 infants were included with complete follow-up data on 87 (87% response rate). Median age at release of TT was 17 (2-88) days without any recurrence. Status at 3months was CR (n=70, 80%); MoR (n=13, 15%), and MiR (n=4, 5%). 43 (49%) were exclusively BF, 36 (41%) were supplementing BF with some formula (2/3 by choice and 1/3 owing to insufficient milk production), and 8 (10%) were using only formula milk (7 by choice and 2 owing to ongoing feeding difficulties). Of the 17 mothers still experiencing symptoms, 5 were exclusively breast-feeding, and 8 were persisting with combined feeds. Another relevant study by Rantalainen et al.,[5] they examined the associations between breastfeeding and its duration on cognitive ability in young adulthood and old age, and on aging-related cognitive change over five decades. In total, 931 men from the Helsinki Birth Cohort Study born in 1934-1944 in Finland took the Finnish Defence Forces Basic Intellectual Ability Test (total and verbal, arithmetic and visuospatial subtest scores) twice, at ages 20.2 and 67.9 years, and had data on breastfeeding (yes v. no) and its duration ('never breastfed', 'up to 3', '3 to 6' and '6 or more months'). Linear and mixed model regressions tested the associations. Neurodevelopmental advantages of breastfeeding and its longer duration persist into old age, and longer duration of breastfeeding may benefit aging-related change, particularly in verbal reasoning ability. Half of the women in the study by Schalla et al.[6] also observed a benefit to their body where this study explored breastfeeding mothers' reports of body-related changes as benefits of breastfeeding. Mothers (N = 182) who currently, or had recently, breastfed an infant completed a survey detailing their infant feeding choices and the perceived benefits of breastfeeding on their bodies. Half of the mothers felt that breastfeeding had a positive effect on their body. In updating our research, Santacruz-Salas et al., 2019[7] focus on the economic benefits of breastfeeding.

Through a longitudinal two-group observational study that included healthy women and newborns (N = 236) in Toledo, Spain they concluded that breastfeeding generated savings in healthcare costs; therefore, it could be a cost-efficient option compared with alternatives. Researchers who evaluate the efficiency of strategies that promote breastfeeding can contribute to the sustainability of health services.

STUDIES THAT RECOMMEND EDUCATIONAL INTERVENTIONS

On the other hand, there are studies that recommend educational interventions such as those of Mallan et al.,[3] which are based on a cross-sectional secondary analysis of data collected as part of a hospital-based longitudinal study of women that commenced in pregnancy (~ 16 weeks). At ~ 4 months postpartum Australian women (N = 477) self-reported breastfeeding problems and reasons for use of infant formula during the first month postpartum. Pre-pregnancy BMI was calculated based on self-reported pre-pregnancy weight and measured height. Binary logistic regression analyses were used to compare pre-pregnancy weight status groups ("non-overweight" [BMI < 25 km/m2] and "overweight" [BMI ≥25 km/m2]) on self-reported breastfeeding problems and reasons for use of infant formula. Analyses were adjusted for covariates that differed between groups (P < .1).

Finally, in this study, which compares women according to their weight, they came to the conclusion that it does not appear that overweight women are more likely to experience a range of specific breastfeeding problems in the first months compared to non-overweight women. However, the severity and duration of the problems needs to be examined. Breastfeeding interventions need to address concerns around milk supply as these are common and are likely to be of universal benefit however overweight women in particular may benefit from guidance regarding the benefits of breastfeeding for both themselves and their infants. Park et al, [8] who dealt with women suffering from gestational diabetes mellitus, distributed questionnaires to 250 people, of whom 237 answered. According to the authors if the knowledge and health beliefs relating to gestational diabetes mellitus during pregnancy are associated with behaviours during pregnancy and lactation, this suggests potential educational interventions. History of drinking and health beliefs such as perceived benefits and self-efficacy were highly associated with breastfeeding intention relating to gestational diabetes mellitus. Education for breastfeeding in gestational diabetes mellitus mothers should focus upon the benefit of breastfeeding and strengthening

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self-efficacy. Also, Eldridge et al.[9] performed a Qualitative study of staff from 21 clinics and they report that implementation experiences were characterized by (1) perceived benefits of implementation, including improved EBF knowledge and counseling confidence among staff; and (2) managing implementation, including responding to challenges posed by clinic settings (resources, routine practices, values, and perceptions of mothers) through strategies such as adapting clinic practices and intervention components. In India, the issue of breastfeeding has been linked to nursing education. According to Marx et al.,[10] assessed data from 60 public health facilities in Uttar Pradesh, India, that received an 8-month staggered coaching intervention from December 2014 to September 2016 as part of the BetterBirth Trial, which is studying effectiveness of an SCC-centered intervention on maternal and neonatal harm. Nurse coaches recorded birth attendants' adherence to 39 essential birth practices. Practice adherence was calculated for each intervention month. After 2 months of coaching, a subsample of 15 facilities was selected for independent observation when the coach was not present. We compared adherence to the 18 practices recorded by both coaches and independent observers. As a result, coaches observed birth attendants' behavior during 5,971 deliveries. By the final month of the intervention, 35 of 39 essential birth practices had achieved >90% adherence in the presence of a coach, compared with only 7 of 39 practices during the first month. Key behaviors with the greatest improvement included explanation of danger signs, temperature measurement, assessment of fetal heart sounds, initiation of skin-to-skin contact, and breastfeeding. Without a coach present, birth attendants' average adherence to practices and checklist use was 24 percentage points lower than when a coach was present (range: -1% to 62%).

Coordination and communication among facility staff, as well as behaviors with an immediate, tangible benefit, showed the greatest improvement. Difficult-to-perform behaviors and those with delayed or theoretical benefits were less likely to be sustained without a coach present. Coaching may be an important component in implementing the Safe Childbirth Checklist at scale. The authors add a note that at the time of publication of this article, the results of evaluation of the impact of the BetterBirth intervention were pending publication in another journal. After the impact findings have been published, they will update the article on the effect of the intervention on birth practices with a reference to the impact findings. The study by Dhakal et al.,[11] aims to identify the factors associated with breastfeeding exclusivity during the first 6 months of life in order to better target public

health interventions in this community towards healthier infant nutrition and address child mortality in this population. Women of reproductive age from 15-49 years and having a child less than 5 years old were selected for the study. Promotion of EBF would be the best approach to prevent undernourishment or malnourishment in child populations where people cannot afford formula and nutrition supplement. EBF is a healthy and cost-effective method of feeding.

The study by Chola et al.,[12] links breastfeeding to economic data as well. Community based breastfeeding promotion programs have been shown to be effective in increasing breastfeeding prevalence. However, there is limited data on the cost-effectiveness of these programs in sub-Saharan Africa. This paper evaluates the cost-effectiveness of a breastfeeding promotion intervention targeting mothers and their 0 to 6-month-old children. Peer counselling more than doubled the breastfeeding prevalence as reported by mothers, but there was no observable impact on diarrhoea prevalence. The study concludes that peer counselling to promote EBF is substantially more expensive than providing advice only through standard health facility-based care. In the study, peer counselling increased both exclusive and predominant breastfeeding prevalence in the first six months. Based on estimations, peer counselling is not likely to be cost-effective in averting DALYs associated with diarrhoea. In updating our study Scott et al., 2019[13] report that the majority of the determinants of continued breastfeeding are either modifiable or could be used to identify women who would benefit from additional breastfeeding support and encouragement. Studying 2147 mothers and 2181 infants they conclude that this study found that just under one-third of Australian women breastfed to 12 months as recommended in the Australian Infant Feeding Guidelines and fewer than 1 in 10 breastfed to 24 months as recommended by the World Health Organization. While there are benefits to be gained from breastfeeding of any duration, the majority of Australian infants and their mothers are missing out on the additional benefits of continued breastfeeding. The majority of factors associated with the practice of continued breastfeeding are potentially modifiable and could be used to identify those women who might benefit from additional breastfeeding support from health professionals in the hospital, their family and partners at home, and from employers in the workplace. Finally, another category of studies is the one that links breastfeeding with specific diseases and questions about the safety of breastfeeding in these cases. According to Wynn et al.,[14] in light of South Africa's high prenatal HIV prevalence and infant mortality rate, a cluster randomized controlled trial was conducted to

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evaluate an intervention called Philani+, which used community health workers (known as Mentor Mothers) to deliver pre- and postnatal home visits in Cape Town, South Africa, to improve maternal and child health. Philani+ improved child health at a relatively low cost, considering the health system costs associated with low birthweight and undernutrition. The model could be suitable for replication in low-resource settings to improve child health in other countries.

STUDIES THAT DO NOT ASSOCIATE BREASTFEEDING WITH POSITIVE RESULTS

There are of course studies that do not show the benefits of the breastfeeding promotion campaign in every instance. One of those is that of Yanq et al.,[15] where a total of 13,557 participants (79.5% of the 17,046 randomized) of the Promotion of Breastfeeding Intervention Trial (PROBIT) were followed up at age 16 from September 2012 to July 2015. At the follow-up, neurocognitive function was assessed in 7 verbal and nonverbal cognitive domains using a computerized, self-administered test battery among 13,427 participants. We observed no benefit of a breastfeeding promotion intervention on overall neurocognitive function. The only beneficial effect was on verbal function at age 16. The higher verbal ability is consistent with results observed at early school age; however, the size of the effect was substantially smaller in adolescence.

Maternal breastfeeding was associated with the presence of pesticides in milk. Thus,Lignell et al[16] , highlighting a randomized controlled trial involving 32 mothers found that Lipophilic POPs are stored in maternal adipose tissue and concentrations in human milk (HM) may increase during weight loss. Weight loss was significantly positively associated with changes in concentrations of all studied POPs (2.0-2.4% increase per percent weight loss). Von Stumm & Plomin show neutral results.[17] Breastfeeding has little benefit for early life intelligence and cognitive growth from toddlerhood through adolescence.

DISCUSSION

In this literature review, 13 studies emerged during the first and 2 during the updating, which were finally included in the review. Of these, 4 show positive results in relation to breastfeeding, 3 do not show any positive correlation and 8 recommend some intervention in or give guidelines in relation to breastfeeding.

Positive results: Positive results are presented in the economic benefits (1), in the benefits of men during the aging-related change, particularly in verbal reasoning ability (1), in the ability of women to regain their normal

physical shape [figure] (1), in the benefit of children and mothers from breastfeeding which takes place after treatment for tongue tie (1).

Educational interventions: This was recommended in studies related to cost effective methods (3), advocated in studies comparing mothers' weight in relation to breastfeeding (1), recommended in studies comparing breastfeeding with health problems (1), proposed in studies highlighting the help of breastfeeding advisers/care providers (2) and finally recommended in studies giving guidelines for the prevention of malnutrition in the infant population (1).

Negative results: These were found in studies dealing with the presence of pesticides in relation to maternal weight loss (1), and in studies dealing with the benefits of breastfeeding in relation to neurocognitive function-IQ (2).

CONCLUSION

Breastfeeding has not lost its importance over the decades. Although breastfeeding issues concerning various diseases have arisen in recent years in conjunction with the medication some women receive during breastfeeding, the importance and benefit of breastfeeding remains unchanged over the years. Only two studies have not shown positive results. Those two studies failed to find any connection between breastfeeding and the development of IQ -neurocognitive function. Through the studies that recommend educational projects/schemes, positive effects of breastfeeding appear in many aspects of the social and personal life of mothers and their children (need for contact of an HIV-infected mother with the infant, fight against malnutrition, etc.). It is recommended that advisors/care providers are trained to encourage mothers to breastfeed their children for at least the first six months.

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ANNEX

FLOW CHART 1: The process of searching and locating research articles

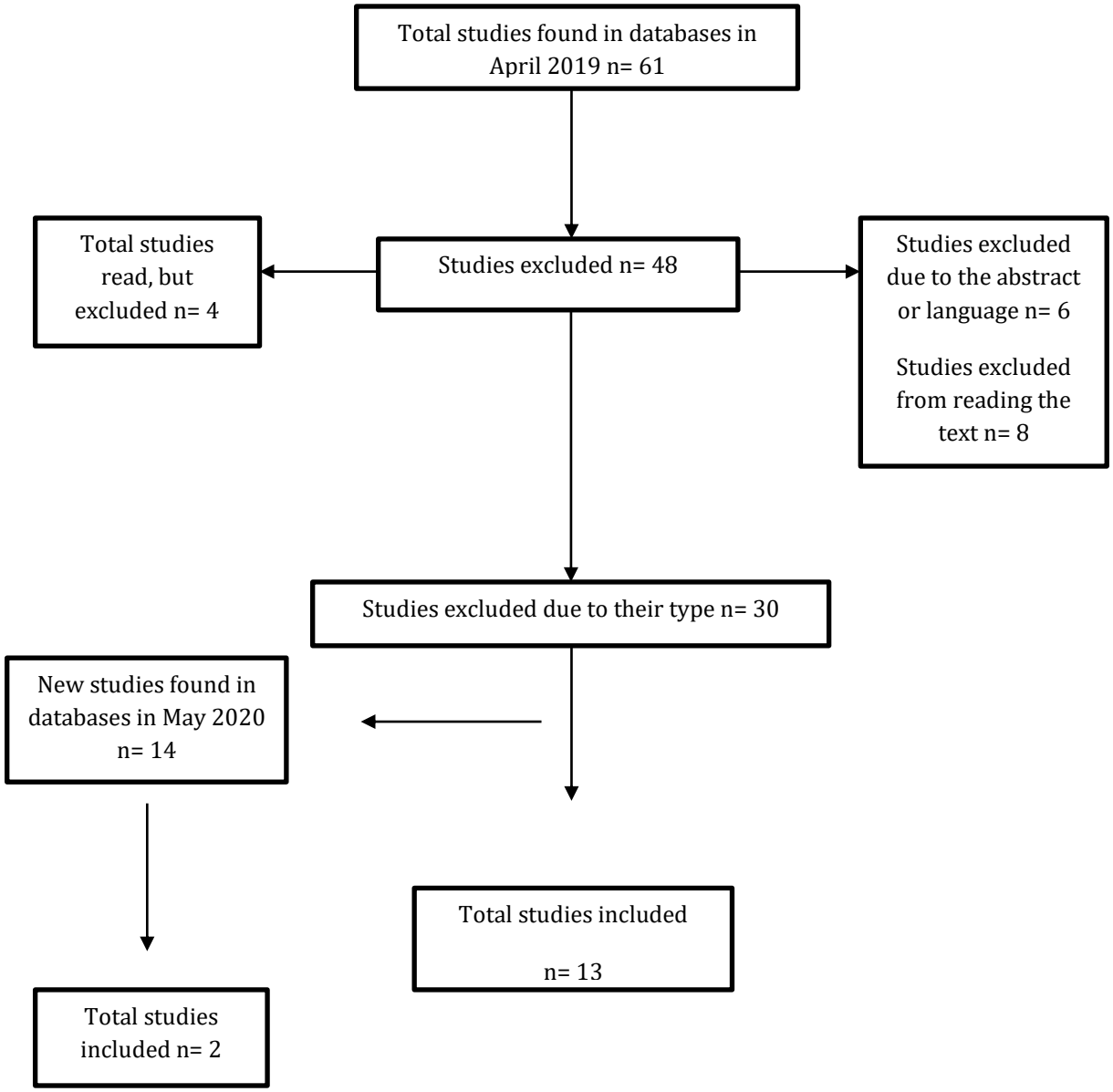

TABLE 1. Included Studies

AUTHOR	POSITIVE RESULT	NEGATIVE RESULT	Recommendation for Intervention or advice/instructions	POPULATION	COUNTRY
1. Billington J, etal 2018	x			100 infants	U.K PROSPECTIVE STUDY
2. Chola L etal 2015			x	329 mother-infants/368 controlgroup	UGANDA COMMUNITY RANDOMIZED TRIAL
3. Dhakal S etal 2017			x	1145 women	CONGO CROSS SECTIONAL SURVEY
4. Eldridge JD etal 2017			x	47 Woman, Infants, and Children (WIC) clinics staff	USA QUALITATIVE STUDY
5. Lignell S etal 2016		x		32 women	SWEDEN RANDOMIZED TRIAL
6. Mallan KM etal 2018			x	477 women	AUSTRALIA cross-sectional secondary analysis of data
7. Marx Delaney M et al 2017			x	5.971 mothersinfants	INDIA ORIGINAL ARTICLE
8. Park S etal 2018			x	250 women	KOREA Cross-sectionaldescriptivesurvey

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9. Rantalainen V etal 2018	x			931 men	FINLAND COHORT STUDY
10. Schalla SC, Witcomb GL, Haycraft E. 2017	x			182 mothers	UK cross-sectional study
11. von Stumm S, Plomin R., 2015		x		11,582 children	U.K RESEARCH ARTICLE (prospective cohort study)
12. Wynn A etal 2017			x	644 philani+/594 standardcare group	SOUTH AFRICA CONTROL RANDOMIZED TRIAL
13. Yang S etal 2018		x		13,557 participants	BELARUS RESEARCH ARTICLE

TABLE 2. Included studies – May 2020

Author	**POSITIVE RESULT**	**NEGATIVE RESULT**	**Recommendation for intervention or advice**	**POPULATION**	**COUNTRY**
1.Santacruz-Salas et al., 2019	x			236 mother-infant	SPAIN Observational study
2.Scott et al., 2019			x	2147 mothers/2181 infants	AUSTRALIA Cohort study

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