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Knowledge of health professionals about breastfeeding and factors that lead the weaning: a scoping review

Conhecimento de profissionais de saúde sobre amamentação e fatores que levam ao desmame: uma revisão de escopo

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Abstract *This review evaluated the knowledge of health professionals (HP) about breastfeeding and factors that leading the weaning. A search was performed in four electronics databases and the grey literature. The search strategy included Mesh terms and synonyms. No language or date restrictions were adopted. Studies that evaluated the knowledge of HP about breastfeeding and weaning were considered eligible. The studies retrieved by the searches were evaluated by two independently examiners. From 1,417 studies retrieved, 35 were included. Many countries and professionals from different health areas were analyzed. No studies evaluated the dentists' knowledge. Although the included HP know the benefits of breastfeeding for health, the length of breastfeeding recommended by the World Health Organization, exclusive or not, was not aligned with all professionals' endorsement. Information about weaning is scarce; however, HP are mindful of the main potential causes of early weaning. The knowledge of HP is conflicting about breastfeeding and unusual about weaning. Furthermore, no studies were found that presented data on the knowledge of dentists on the subject. Thus, assessments of dentists' knowledge and education measures for HP are necessary since they are frequently questioned about these issues.*

Key words *Breast feeding, Weaning, Health personnel, Health knowledge, Attitudes*

Resumo *Esta revisão avaliou o conhecimento dos profissionais de saúde (PS) sobre amamentação e fatores que levam ao desmame. Realizou-se buscas em quatro bancos de dados eletrônicos e literatura cinzenta. A estratégia de busca incluiu termos Mesh e sinônimos. Não se adotou restrição de idioma ou data. Estudos avaliando o conhecimento dos PS sobre amamentação e desmame foram elegíveis. Estudos recuperados pelas buscas foram avaliados por dois examinadores independentes. Dos 1.417 estudos recuperados, 35 foram incluídos. Muitos países e PS de diferentes áreas foram analisados. Nenhum estudo avaliou o conhecimento dos dentistas. Embora os PS conheçam os benefícios da amamentação, a duração recomendada pela Organização Mundial da Saúde, exclusiva ou não, não está alinhada com o endosso de todos os PS. Considerando o desmame, a informação é escassa. No entanto, os PS estão atentos às principais causas potenciais do desmame precoce. O conhecimento dos PS é conflitante sobre amamentação e incomum sobre o desmame. Não foram encontrados estudos que apresentassem dados sobre o conhecimento de dentistas sobre a temática. Investigações quanto ao conhecimento dos mesmos e medidas de educação para todos os PS são necessárias, considerando que são frequentemente questionados sobre o tema.*

Palavras-chave *Aleitamento materno, Desmame, Pessoal de saúde, Conhecimentos, Atitudes*

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Introduction

The American Academy of Pediatrics and the World Health Organization (WHO) recommend that infants receive human milk exclusively for the first six months of life and that breastfeeding continue beyond the first or second year of life as long as a family deems appropriate[1]. Breastfeeding offers numerous health benefits for both the baby and the mother in the short and long term. Exclusive breastfeeding reduces the risk of infant mortality by protecting the baby from infectious and chronic diseases, as well as promoting his sensory and cognitive development[2].

The term weaning refers to the long transition process in which the child changes from the total dependence on breast milk to the complete interruption of feeding with milk[3,4]. Therefore, weaning begins with the introduction of any food other than breast milk and ends when the baby is fed with milk for the last time. Complementary feeding is the period between these two milestones, that is, the association of other foods together with milk[5].

Therefore, WHO and United Nations International Children's Emergency Fund (UNICEF) have suggested implementing a program called Ten Steps to Successful Breastfeeding in all institutions providing maternity and newborn services worldwide. The program seeks to support breastfeeding in ten steps, such as ensuring that the professionals involved have sufficient knowledge, competence and skills to support this practice, as well as counseling mothers on the use and risks of feeding using bottles with teats and sucking on pacifiers[6].

In this context, a multiprofessional team is the ideal, where the dentist, as a health professional, should be included being able to guide the woman on the importance of breastfeeding since there is a strong relationship between natural breastfeeding and the development of the stomatognathic system[7].

Therefore, knowing the importance of breastfeeding for general health of the baby, this scoping review aimed to evaluate in the available literature the knowledge of health professionals about breastfeeding and weaning, mainly related to exclusive breastfeeding time, weaning age and factors that may be related to early weaning. Thus, this review sought to answer the following question: "What does the literature report about the knowledge of health professionals on breastfeeding and weaning and what are the work areas of these professionals?"

Materials and methods

This scoping review was developed and conducted following the recommendations of Arksey and O'Malley's[8] and Levac, Colquhoun and O'Brien[9].

Information sources and search strategy

The search was performed in four electronic databases (PubMed, Lilacs/BBO SciELO and Web of Science) and the grey literature (Open Grey and Trip Database) up to April 2020. The search strategy included the health terminology identified at the Medical Subject Headings (Mesh terms) and synonyms related to the review objective and adapted for each database. There was no language or date limitation. The terms used to construct the strategies were "weaning", "breastfeeding", "health education", "health knowledge, attitudes, practice", "health education", "health knowledge, attitudes, practice", "health personnel" and "allied health personnel". An expert librarian (DMTPF) guided all process of definition of the included terms in the applied search strategy, as well as the search in each database. The combinations of the terms used in each database are described in Chart 1.

Eligibility criteria and selection of studies

Based on the PCC framework[10], the inclusion criteria were cross-sectional study, qualitative study, and self-report survey design with humans (P), found by online search strategy (C) to assess the knowledge of health professionals about breastfeeding and weaning as primary or secondary outcomes (C). Two reviewers (MLD and KRD) analyzed independently the titles and abstracts of the articles retrieved from searches to identify those potentially eligible for this study. The exclusion criteria were animal and clinical trials studies, literature or systematic reviews, guidelines, editorials, letters to the editor, studies with health students and/or professionals from areas different of health, studies about mother's knowledge, studies that assessed knowledge after an intervention and studies that did not cover the topic relevant to the review objective. If some abstract did not provide enough information for a definite decision, full articles were evaluated. Uncertainties about inclusion were discussed with a third reviewer (AFG), who had read the respective titles and abstracts. Studies available in more than one database were considered only once. Finally, a hand search was performed in

Chart 1. Descriptors and their combinations of search strategy in each database.

Electronic databases	Search strategy
PubMed	((weaning[mh]) OR (weaning[tiab]) OR (breastfeeding[mh]) OR (breastfeeding[tiab])) AND ((health education[mh]) OR (health knowledge, attitudes, practice[mh]) OR (health education[tiab]) OR (health knowledge, attitudes, practice[tiab])) AND ((health personnel[mh]) OR (health personnel[tiab]) OR (allied health personnel[mh]) OR (allied health personnel[tiab]) OR (health professionals[tiab]))
LILACS e BBO	(mh:(weaning)) OR (tw:(weaning)) OR (mh:(breastfeeding)) OR (tw:(breastfeeding)) AND (mh:(health education)) OR (mh:(health knowledge, attitudes, practice)) OR (tw:(health education)) OR (tw:(health knowledge, attitudes, practice)) AND (mh:(health personnel)) OR (tw:(health personnel)) OR (mh:(allied health personnel)) OR (tw:(allied health personnel)) OR (tw:(health professionals))
SciELO	((subject:weaning) OR (subject:breastfeeding)) AND ((subject:health education) OR (subject:health knowledge, attitudes, practice)) AND ((subject:health personnel) OR (subject:allied health personnel) OR (subject:health professionals))
Web of Science	#3 AND #2 AND #1 # 3 TS=("health personnel" OR "allied health personnel" OR "health professionals") # 2 TS=("health education" OR "health knowledge, attitudes, practice") # 1 TS=(weaning OR breastfeeding)
Open Grey	(weaning OR breastfeeding) AND ("health education" OR "health knowledge, attitudes, practice") AND ("health personnel" OR "allied health personnel" OR "health professionals")
Trip Database	(weaning OR breastfeeding) AND ("health education" OR "health knowledge, attitudes, practice") AND ("health personnel" OR "allied health personnel" OR "health professionals")

Source: Authors.

the reference list of the included studies. When the full texts were not available, the authors were contacted by e-mail and the research gate website (eight articles were requested by this means). The EndNote website was used for literature management.

Data extraction

Data extracted of the included studies were: characterization of the study (authors, year of publication and country), study design (cross-sectional, qualitative study and self-report survey design), sample (professional category and number of participants), methodology used (questionnaires or others) and main results (exclusive or not exclusive breastfeeding, exclusive and combined breastfeeding time and factors that lead to weaning and others results). When these data were not available in the full texts, the authors were contacted by e-mail and the research gate website. The data collected were analyzed descriptively.

Results

Study selection

Figure 1 presents the flow diagram with the search process. A total of 1,417 studies were identified and 1,362 records remained after the removal of duplicates using the reference manager website. Posteriorly, another 1,310 studies were removed after their titles and abstracts have been evaluated because they did not meet the inclusion criteria. Fifty-two full texts were read and 17 were excluded due to not fulfilling the inclusion criteria. The reasons for the exclusions are described in Figure 1. Ultimately, 35 studies were included in this scoping review.

Study characteristics

Chart 2 shows the characteristics of the 35 included studies in this scoping review. The articles were published between 1984 to 2019. Twelve studies were carried out in the United

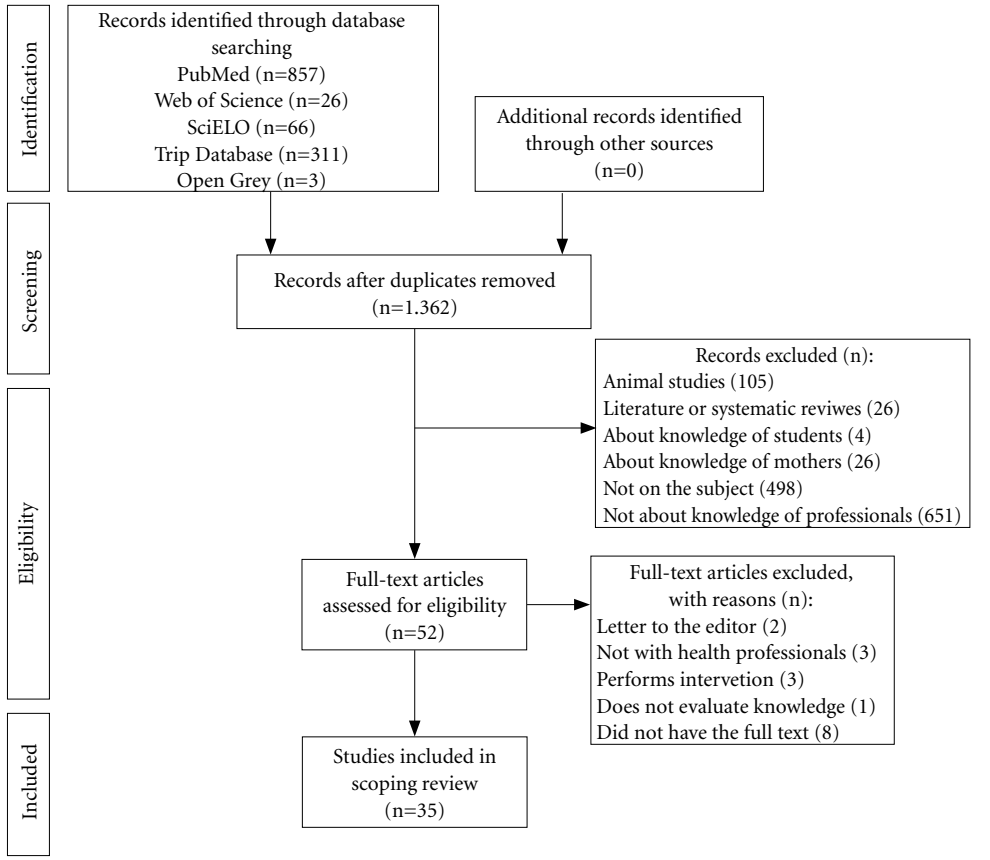

Figure 1. Flow diagram of databases searched according to PRISMA guidelines.

Source: Authors.

States of America (USA), four in Brazil, two in Australia, two in Turkey, two in Pakistan and two in Puerto Rico. The other countries that carried out a study were China, Sweden, Chile, Norway, Egypt, France, Lithuania, Iraq, Nigeria, England and India. The articles were written in four languages, English, Portuguese, Spanish, French and Chinese.

Twenty-six cross-sectional studies, five qualitative studies, two descriptive studies, one self-report design and one exploratory study were selected. Questionnaires were used by 27 studies as a method of assessing knowledge, the number of questions ranged from 10 to 139. The other forms of evaluation were interviews and focus groups, chosen by six and two studies, respectively.

A total of 43,579 health professionals were investigated. Of these, 4542 were nurses, 1763 were doctors, 893 midwives, 177 nutritionists, 119 nursing technicians, 99 paramedics, 65 health educators, 29 pharmacists, 23 community health agents, 12 medical office assistants and 1 dental assistant. In four studies, the professional category was not described and one study did not differ the number of nurses from the number of midwives, totaling 35,809 professionals. No studies that evaluate dentists' knowledge were found.

When the knowledge about breastfeeding was investigated in general – such as the benefits, the difference between the formula used, importance of colostrum – four studies reported a high knowledge level related to breastfeeding[11-14]. Other studies reported regular knowledge level[15-17] or good knowledge level[18] for most of the investigated sample. With regard to the benefits of breastfeeding, the professionals cited: best source of nutrition for babies[19-22], protection against infections in babies[19,23-26], increased immune function[23-25], prevention of maternal diseases – such as breast cancer[27,28], increased emotional bond between mother and child[28], be convenient[22] and that it is a cheap food[19,22,28].

Chart 2. Description of the included studies.

Author (year)	Country	Study design	Sample	Methodology used	Main results
Xian et al. (2019)	China	Cross-sectional study	35.243 health professionals	Questionnaire	75.3% of the respondents had a high rate of knowledge about breastfeeding. The rate of knowledge about exclusive breastfeeding was high (86.7%)
Alakaam et al. (2018)	USA	Self-report survey design	302 nurses	Questionnaire	Total knowledge scores ranged between 19 and 39 in the overall sample, with the mean score 32,75. 33 respondents (10.9%) earned a perfect score to breastfeeding knowledge. When questioned "When Should the Mother Stop Breastfeeding?" 46.7% of nurses answered in cases of breast abscess, 34.1% in cases of mastitis and 30.8% in cases of the baby have frequent loose stools
Melin, Björklund and Zwedberg (2018)	Sweden	Qualitative study	12 pediatricians	Individual semi-structured interviews	All pediatricians agreed that they played an important role in promoting breastfeeding and believed that they possessed excellent understanding of when supplemental feeding was necessary. Several factors have been described as influencing mothers' decisions to not breastfeed or discontinue after a few months, including mental health conditions, breast surgeries, the use of prescription drugs, social situations and socioeconomic conditions (lower breastfeeding rates in low-income areas). Respondents thought that breastfeeding for more than one year was not compatible with the predominant current lifestyle
Holtzman and Usherwood (2018)	Australian	Qualitative study	10 general practitioners (GP)	Semi-structured interviews	GPs interviewed felt that the decision to wean was an individual one. Only one GP mentioned the Australian National Health and Medical Research Council guidelines, which recommend exclusive breastfeeding up to 6 months and continuation of breastfeeding for at least 12 months. One GP stated that he recommends mothers to wean if the baby bites while breastfeeding. Some GP were supportive extended breastfeeding (beyond the age of 2 years) and others had quite negative views about it
Marambio, Benadof and Huerta (2017)	Chile	Cross-sectional study	78 health professionals (midwives, doctors, nurses and nutritionists)	Questionnaire with 22 questions	42.2% were correct between 50 and 67% of the questions correctly (regular knowledge), 29.5% were correct 75% (very good knowledge), 24.4% were correct between 68 to 74% (good knowledge). Only 3.8% of the participants answered less than 50% correctly, being all these doctors. Most nutritionists, midwives and nurses demonstrated knowledge classified as very good or good. 65.4% of doctors were classified as having regular knowledge
Svendby et al. (2017)	Norway	Cross-sectional study	69 general practitioners (GPs)	Questionnaire	39% of professionals recommend exclusive breastfeeding for 6 months and 44% recommend that the child be breastfed only up to a maximum of 12 months. 26% stated correctly that formula and human milk differ with respect to nourishment and long-term health effects. 42% of GPs considered maternal HIV infection to represent a contraindication for breastfeeding

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Chart 2. Description of the included studies.

Author (year)	Country	Study design	Sample	Methodology used	Main results
Artantas et al. (2016)	Turkey	Cross-sectional study	25 gynecology and obstetrics, 11 pediatrics, 64 family medicine, 74 general practitioners, 447 midwife-nurse	Questionnaire with 29 questions	Most participants (94.9%) recommended exclusive breastfeeding for the first 6 months of age. For the period after the initiation of complementary food, 84.8% were suggesting the continuation of breastfeeding until 2nd year of age and 10.1% suggested breastfeeding until one year of age. 59.9% of the participants declared that breast milk would not be enough for twin babies and formula shall be used
Dias et al. (2016)	Brazil	Qualitative study	8 nurses	Semi-structured interviews	Most participants reported that one of the advantages breastfeeding for the family, prevention and promotion of child and maternal health, through the prevention of maternal and child diseases. Another advantage very emphasized by most nurses was the increase in emotional bonds between mother and child and family, as well as family unity and increased bonding. In addition, nurses highlighted the economics and practicality of breastfeeding as an advantage
Sims et al. (2015)	USA	Cross-sectional study	29 doctors	Questionnaire with 33 questions	The identified barriers to exclusive breastfeeding included families not being well informed (62%), families wanting formula (55%), inadequate lactation consultation (38%), recommendation for formula by nurses (35%), nursing staff not encouraging breastfeeding (35%), doctors not encouraging breastfeeding (21%) and recommendation for formula by neonatologist (7%)
Fonseca-Machado et al. (2014)	Brazil	Cross-sectional study	45 nurses and 40 nursing technicians	Semi-structured questionnaire	48.2% of participants believe that, if the is milk letdown up to three days after delivery it is necessary to initiate food supplementation and 44.7% disagree this affirmation. If the production of milk is decreased and the baby shows to be hungry, 24.7% believe that supplementation should start immediately
Sallam et al. (2013)	Egypt	Qualitative study	30 women healthcare workers (15 nurses, 15 doctors)	Oral interviews	Respondents had good knowledge about importance of early breastfeeding initiation, as 96.7% were aware of the benefits of colostrum and 93.3% of them had a positive attitude regarding early breastfeeding initiation being right for each baby
Schaffar et al. (2012)	France	Cross-sectional study	29 pharmacists	Questionnaire with 26 questions	The WHO recommendation for the duration of exclusive breastfeeding was known by 55% of pharmacists. In cases of breast clefts, 90% of pharmacists advised the continuation of breastfeeding and 10% advised that the position of the baby in the breast be corrected. For mastitis, the first attitude of pharmacists was to direct the mother to a doctor (38%). Faced with a woman complaining of insufficient lactation, none of the participants responded to advise stopping breastfeeding. About the factors that contraindicate breastfeeding, pharmacists pointed to infection by the human immunodeficiency virus (HIV) (62%), active tuberculosis (48%) and the child's galactosemia (31%)

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Chart 2. Description of the included studies.

Author (year)	Country	Study design	Sample	Methodology used	Main results
McLaughlin et al. (2011)	Australian	Cross-sectional study	241 pediatric nurses	Questionnaire with 139 items	97% knew the benefits of breast milk for the baby. Some believed infant formula is a nutritional equivalent to breastmilk and a number were unaware that supplemental formulas can interfere with the success of breastfeeding. 26% of respondents did not agree breastfeeding should continue until two years of age and beyond and 19% were unsure. 85% of participants replied that mothers should not stop breastfeeding when infant is teething. 25% of participants indicated that they would recommend ceasing breastfeeding in response to maternal fatigue
Hanif et al. (2010)	Pakistan	Cross-sectional study	197 doctors and 99 paramedics	Questionnaire	100% of doctors and paramedics agreed that breast milk is beneficial for baby and 85% of doctors pointed as advantage of breastfeeding the protection against infection. 49.7% of doctors believe that weaning with the introduction of food in addition to breastfeeding should be at 6 months, while 30.0% believe that it should be at 4 months. 70.0% of doctors believe that breastfeeding should be continued for 24 months
Leavitt et al. (2009)	Puerto Rico	Cross-sectional study	111 pediatricians, 48 gynecologists, 11 family medicine, 7 other specialty	Questionnaire with 20 questions	74% of doctors recommended exclusive breastfeeding to their patients, while 19% advising a combination of formula and breast milk. 61% recommended breastfeeding for at least 6 months and 24% for the length of time the mother prefers. 44% will recommend starting breastfeeding during the first hour after birth and 38% as early as the mothers wants to. Doctors were asked about contraindications to breastfeeding responding: the use of illicit drugs (94%), HIV (93%), Hepatitis B e C (57% e 55%), breast abscess (55%), mastitis (22%) and cracked nipples (15%). Infants' contraindications to breastfeeding included: galactosemia (72%) and jaundice (16%)
Levinienė et al. (2009)	Lithuania	Cross-sectional study	84 general practitioners (GP) and 52 nurses	Questionnaire	51% of GP and 45% of nurses recommended mothers to give additional liquids between breastfeeding of an infant and 1/3 of health care professionals recommended mothers to give complementary food for infants before 6 months of age. Only 21.6% of GP and 27.5% of nurses knew that breastfeeding accompanied with complementary food should be continued until the age of 2 years and longer
Marques et al. (2009)	Brazil	Cross-sectional study	2 doctors, 3 nurses, 2 nursing technicians, 1 dental assistant and 1 nutritionist and 23 community health workers	Semi-structured interviews and focus group	82.4% reported not having received any specific course on breastfeeding. It was observed that the act of breastfeeding was considered important for the baby. When asked if they considered themselves capable of guiding mothers on the correct lactation practice, health professionals pointed out the need for training. Moreover, the knowledge passed on by professionals to mothers was obtained through their experience, as a mother, or through the observation of mothers in the community in which they live and/or work

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Chart 2. Description of the included studies.

Author (year)	Country	Study design	Sample	Methodology used	Main results
Silvestre et al. (2009)	Brazil	Cross-sectional Study	55 nurses and 34 doctors	Structured questionnaire with open and closed questions	77.5% of respondents advise maintaining exclusive breastfeeding when mothers work outside the home. 72.5% advise against formula if the baby is healthy. Less than half of the participants pointed out that infant formula should be offered immediately to children who show signs of hunger, slight deceleration in weight gain, who show no support on the 3rd postpartum day or when the mother will return to work in the 3rd month after-birth. 92.1% of participants indicated 6 months as the ideal duration of exclusive breastfeeding. About the duration of breastfeeding 83.1% of the participants considered that it should be for 24 months or more
Szucs, Miracle and Rosenman (2009)	USA	Qualitative study	36 HPs (pediatric and obstetric doctors; pediatric, obstetric, public health and telephone triage answering service nurses; WIC personnel and inpatient lactation consultants)	Focus groups	Cultures and attitudes shaped widely divergent views among providers toward breastfeeding in public and duration of breastfeeding. In all of the non-doctors focus groups, there were examples in which providers' personal breastfeeding experiences led to advice for women that was contrary to evidence-based recommendations. Specific examples included advice about use of early pacifier, duration of breastfeeding, exclusivity of breastfeeding, or normal weight loss in the postpartum period
Karaçam and Kitis (2005)	Turkey	Cross-sectional study	301 midwives and nurses	Questionnaire with 22 questions	61.1% midwives and nurses recommended that babies should be exclusively breast fed for 6 months and 33.9% reported that exclusive breast feeding for 4–6 months would be appropriate. 95.0% participants gave one or more situations to feed babies with artificial milk before 6 months, such as: insufficient weight gain of the babies, maternal conditions, lack of breast milk, baby conditions, working mothers and premature babies or low birth weight. 47.5% of the participants recommended that breast milk should be collected when mothers resumed working and 26.6% reported recommending that breast milk should be expressed but added that artificial milk could be given
Al-Nassaj, Al-Ward and Al-Awqati (2004)	Iraq	Cross-sectional study	75 resident doctors (RDs) and 50 general practitioners (GPs)	Questionnaire with 50 items	GPs had the most positive attitudes towards breastfeeding when asked "What do you prefer for feeding your baby in the future?" 86.0% thought breastfeeding was the preferred type of infant feeding compared with only 57.3% of RDs. 49.3% of RDs agreed they would encourage a working mother to breastfeed her baby in her workplace compared with 60.0% of GPs. Scores on knowledge and problem-solving approaches towards breastfeeding were slightly higher among GP (50.0% of GP and 45.3% of RDs had adequate knowledge)

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Chart 2. Description of the included studies.

Author (year)	Country	Study design	Sample	Methodology used	Main results
Hellings et al. (2004)	USA	Cross-sectional study	95 pediatric nurse practitioners (PNP)	Questionnaire	90.8% would encourage more frequent breastfeeding when there was concern regarding the mother's milk supply in the first two weeks, whereas only 1.3% would supplement with glucose and 0.3% would supplement with formula. 88.2% recommended increased breastfeeding when the concern was jaundice in an otherwise healthy 4-day-old infant, however, while 5.5% would supplement with glucose water and 1.3% would supplement with formula. 96.1% would not stop breastfeeding in a patient with mastitis or in the presence of concern over milk supply, 100% would not stop because the baby was teething, 98.7% would not stop if the baby was having frequent loose stools, and 97.4% would not recommend the cessation of breastfeeding if the baby did not seem satiated. Only with a breast abscess was there increased uncertainty about management
Spear (2004)	USA	Descriptive study	151 nurses	Questionnaire	88.0% of the participants agreed that adolescent mother's ought to be encouraged to breastfeed and only 11.9% of the participants indicated that they did not agree with this statement. A few participants were somewhat skeptical about the ability of adolescents to successfully breastfeed because to the issue of developmental stage and maturity. 41.1% of nurses did not know there are nutritional differences between breast milk and infant formula
Okolo and Ogbonna (2002)	Nigeria	Cross-sectional study	6 doctors and 160 nurses	Structured interviewer questionnaire	23.1% nurses believe babies less than six months should not be given water. Less than 50% of each professional category believes complementary feeding should start at 6 months
Hellings and Howe (2000)	USA	Cross-sectional study	405 nurses	Questionnaire	90.1% would encourage more frequent breastfeeding when there was concern regarding the mother's milk supply, 1.3% would supplement with glucose and 0.3% would supplement with formula. No respondent recommended the cessation of breastfeeding. 81.5% recommended increased breastfeeding when the concern was jaundice, 11.5% would supplement with glucose and 0.3% would supplement with formula. 91.4% would not stop breastfeeding in a patient with mastitis, 95.8% would not stop in the presence of concern over milk supply, 94.6% said no in the presence of a teething baby, 95.1% would not stop if the baby was having frequent loose stools, and 95.6% would not recommend the cessation of breastfeeding if the baby did not seem satiated. Only with a breast abscess was there uncertainty
Rasheed, Siddiqui and Baig (2000)	Pakistan	Cross-sectional study	70 nurses (16 qualified and 54 non-qualified)	Questionnaire	58.55% recommended the introduction of a bottle from the first day, while 28.57% said that it should not be administered. 27 professionals would not indicate continuation of breastfeeding when the mother had a nipple flap and 40 when the baby had diarrhea

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Chart 2. Description of the included studies.

Author (year)	Country	Study design	Sample	Methodology used	Main results
Register et al. (2000)	USA	Descriptive study	12 medical office assistants, 23 licensed practical nurses and 99 nurses	Questionnaire with 42 items	58% agreed or strongly agreed that exclusive breastfeeding is a beneficial form of nutrition. 35% agreed or strongly agreed with the statement that supplementing breastfeeding with formula during the first 2 weeks of life is a cause of breastfeeding failure
Meaux et al. (1999)	Puerto Rico	Exploratory study	29 pediatrics 26 gynecology and obstetrics	Questionnaire	27.8% of doctors would recommend a combination of natural and artificial breastfeeding for mothers who are lactating but are concerned about milk production during the first two weeks of birth. While 64.8% would recommend exclusive breastfeeding. 63.6% of doctors recommend complete weaning in cases of abscess and 30.9% in cases of mastitis. In addition, when there is diarrhea, significantly more with obstetricians (26.9%) than pediatricians are (3.4%). 100% of obstetricians and 96.2% of pediatricians do not recommend weaning when the eruption begins
Burglehaus et al. (1997)	England	Cross-sectional study	24 obstetricians; 20 pediatricians; 69 family practitioners; 97 general practitioners	Questionnaire with 40 questions	In the face of breastfeeding problems, 94% of doctors reportedly always or usually encourage patients to continue breastfeeding. Family practitioners more strongly believed that breastfeeding provides adequate nutrition than did doctors in other specialties and general practitioners were more likely to be neutral or disagree. 24% of doctors felt that adding cereals to the infant's diet helps the infant sleep through the night
Patton et al. (1996)	USA	Cross-sectional study	230 nurses	Questionnaire with 19 questions	64% of the nurses indicated they were very interested in helping mothers learn how to breastfeed and would encourage breastfeeding. 75% nurses classified the time factor as primary nursing barriers to breastfeeding promotion. 64% of nurses mentioned that the most common form of breastfeeding information sources was their personal experience with breastfeeding. The most common maternal barriers to breastfeeding mentioned by nurses were incomplete knowledge and psychological support
Lazzaro et al. (1995)	USA	Cross-sectional study	151 HPs (doctors, nurses, licensed practical nurses, medical assistants, and nutritionists)	Questionnaire with 17 questions	91% of the doctors and 92% of the nurses in private offices advocate breastfeeding when a mother is undecided about infant feeding. All categories of professionals recommend giving supplements to breastfed infants. 81.7% agreed with the statement that supplementation with formula in the first 2 weeks of life is a cause of breastfeeding failure. Between 87-100% of respondents rated the mother's return to work or school as more important than other reasons for early cessation of breastfeeding, such as baby teething

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Chart 2. Description of the included studies.

Author (year)	Country	Study design	Sample	Methodology used	Main results
Barnett, Sienkiewicz and Roholt (1995)	USA	Cross-sectional Study	1754 nurses; 135 nutritionists; 135 pediatricians; 65 family doctors; 55 obstetricians; 65 health educators	Questionnaire with 10 belief statements	80% of health professionals strongly disagreed that most breastfeeding babies require supplemental formula to gain sufficient weight. Only 14% of professionals with somewhat negative beliefs advocated weaning at 2 years of age or older, compared with 24 percent of those with somewhat positive beliefs and 47 percent with positive beliefs. Breastfeeding beliefs, work environment, and personal breastfeeding experience each significantly influenced advocacy of early weaning from the breast, defined as 9 months of age or younger
Bagwell et al. (1993)	USA	Cross-sectional Study	41 nutritionists, 158 nurses and 90 doctors	Questionnaire	HPs were slightly less likely to recommend breastfeeding to working mothers, mothers in school, and adolescent mothers. They did not recommend breastfeeding for mentally retarded mothers. nutritionists and nurses were more likely to recommend breastfeeding to a mother who had made the decision to bottle-feed than were doctors. Doctors were less likely to think that breastfeeding was incompatible with working outside the home or attending school than were nurses. nutritionists were more interested in breastfeeding and lactation management than were nurses. Nurses were more likely than dietitians and doctors to think that mastitis and engorgement are reasons to discontinue breastfeeding
Hull, Thapa and Wiknjosastro (1989)	Indonesia	Cross-sectional study	111 midwifes; 26 nurses; 12 general practitioners; 11 obstetrician/ gynecologist; 7 pediatricians	Questionnaire	50% of health providers thought that exclusive breastfeeding was sufficient for only 3 months and a further 16% for only 2 months. Most respondents felt that solid food should be introduced at 3-4 months of age. 68% of health providers felt that a baby with diarrhea should still be breastfed
Popkin, Yamamoto and Griffin (1984)	USA	Cross-sectional study	189 doctors, 280 nurses, 782 midwives, 47 health aides	Questionnaire	More than 70% of the professionals contraindicated the continuation of breastfeeding in the following situations: breast abscess, mothers with tuberculosis and babies with diarrhea

HPs: health professionals. HIV: human immunodeficiency virus. WIC personnel: these are usually for nutrition assistants, clerks, breastfeeding peer counselors, dietitians, nutritionists and custodians. WHO: World Health Organization.

Source: Authors.

The duration of exclusive breastfeeding was investigated by eleven studies. A high level of recommendation was reported by two authors, reaching more than 90% of participants who recommended exclusive breastfeeding until to six months[27,29]. Regular level of recommendation was found in four studies, where the recommendation up to six months ranged from 49% to 61% among professionals[30-33]. In five studies, a low knowledge level about the time of exclusive breastfeeding was observed[22,26,34-36] where the percentage reached up to 61% of error in the recommendation[36].

Eight studies assessed knowledge about the duration of breastfeeding. Of these, three reported a high knowledge level of the sample with a recommendation level for breastfeeding continuation up to 24 months by 70%[26], 83.1%[29] and 84.8%[27] of the professionals, respectively. The other four studies reported a low knowledge level about breastfeeding time[21,22,31,36,37], where 66% of the sample did not recommend that it would be

performed until 12 months[36] and almost half of another sample (45%) did not agree or were not sure about that time[21].

The reasons cited by the professionals to stop breastfeeding or does not recommend its performance were related to mothers, such as: breast abscess[13,38,39], mastitis[13,32,39,40], HIV infection[32,33,36], active tuberculosis[33,38], cracked nipples[32,41], hepatitis B[32,33], hepatitis C[32,33], working mothers[30,37,40], student mothers[40], teenage mothers[16,40], mental retardation[40], maternal fatigue[21], use of illicit drugs[32] and lack of breast milk[30]. The reasons related to babies were: baby's diarrhea[13,38,39,41], child's galactosemia[32,33], child's jaundice[32], engorgement[40], biting while breastfeeding[22], dehydration up to three days after delivery[42], baby seems to be hungry[42], insufficient weight gain for babies[30] and premature babies or low birth weight[30].

In two studies[43,44] the professionals pointed out causes that can influence early weaning, such as: maternal mental health conditions, breast surgeries, prescribed medications, social situations, socioeconomic conditions, return to work[43], families that were not well informed, families that prefer a formula, a nurse's recommendation, a nursing team that did not encourage breastfeeding, a neonatologist's recommendation, doctors that do not encourage breastfeeding and inadequate lactation consultation[44].

The barriers highlighted by health professionals to promote breastfeeding were: lack of knowledge and psychological support to mothers[45], lack of professional time[33,45], need for training, being comfortable to guide mothers only when they asked, and they do not believe that they can influence the mother[33].

Discussion

Breastfeeding is a natural process of mammals that has health and psychological benefits for both mother and baby[2]. As evidenced by our results, most professionals are familiar with these benefits[19,21-23,27,28,32]. However, according to the World Health Organization (WHO), almost two out of three babies are not exclusively breastfed until the age of six months, a fact that has not improved in decades[46].

The economic benefit of breastfeeding was highlighted among the health professionals who participated in the reviewed studies[19,22,28], being considered the cheapest way to feed a baby. Despite this benefit, Melin, Björklund and Zwedberg[43] reported that doctors believed that one of the factors related to the mothers' decision not to breastfeed or stop after a few months would be the socioeconomic condition, since low-income countries have lower rates of breastfeeding. This behavior contradicts the findings of a major literature reviewed that states that, with a few exceptions, the duration of breastfeeding in high-income countries is shorter compared to low-income countries[47].

In our results, many professionals agree that they play an important role in the approach of breastfeeding[43,44] and that they act directly in this process helping with breastfeeding techniques, advice on infant feeding methods[19], prenatal counseling and lactation problems[13]. However, professionals report that they receive guidelines about the benefits of breastfeeding during their courses, but practical training on breastfeeding techniques is insufficient[32]. Melin, Björklund and Zwedberg[43] highlight that courses are concerned with the type of baby's nutrition and not with the practical of breastfeeding itself. Thus, health professionals reported having acquired their knowledge about the practical of breastfeeding with professionals different from their own area[45], or through their own experience as mothers or still through the observation of mothers in the community that they live or work[25], and also through lectures[15].

It is important to report that attitudes and practices about breastfeeding and weaning were not actually evaluated in the present study, as there were no studies that assessed such outcomes, which could be a limitation. This was the reason why the keywords "attitudes" and "practice" appears in the search strategy, but nothing is presented about this issue.

Two studies show that the level of professional qualification influences the knowledge about breastfeeding of health professionals, where professionals with higher educational background had a higher rate of knowledge than those with less education[14,41]. In our work, studies with graduated and non-graduated professionals were included. Thus, we do not believe that this factor has negatively influenced our results, as some professionals included in the samples of the selected studies did not graduate from universities, but receive specific training for breastfeeding and breast milk[23,27]. However, most of the studies included in our review have a sample of graduated professionals.

Another factor that influenced the level of knowledge of professionals was personal experi-

ence. However, this personal experience should be interpreted with caution, as demonstrated by Szucs et al.[17], who affirmed that personal experience of health professionals referring to breastfeeding may be related to recommendations contrary to the evidence-based recommendations. In addition, Xian et al.[14], highlighted that health professionals who were parents of children up to two years old had more knowledge about breastfeeding than professionals who did not have children. Also, Svendby et al.[36] reported that female professionals had more knowledge than male professionals.

When comparing the knowledge of different professionals, one study related that the knowledge of doctors was lower than those of nutritionists, midwives and nurses[18]. However, in another evaluation[40], they did not show scores that were statistically different from those of nutritionists or nurses. Although they reported being able to manage medical problems such as mastitis, doctors reported delegating the responsibility of providing practical breastfeeding support to lactation consultants[22] and midwives[43]. Therefore, there is a need to improve multiprofessional work and communication between the groups involved with breastfeeding, highlighting that they should receive mutual learning[43].

Considering the breastfeeding time, the WHO recommends exclusive breastfeeding for the first six months of life, followed by breastfeeding associated with adequate complementary food for up to two years or more[48]. It is known that exclusive breastfeeding is the best source of protection and nutrition for the baby up to the sixth month of life, with no other type of food or liquid necessary[49]. However, our results show that knowledge about exclusive breastfeeding for up to six months is not satisfactory[22,26,31,34-36]. It has been shown that doctors and nurses recommended that mothers give liquids and solid foods to babies under six months of age[31].

Even though the WHO recommendation is not current[48], our results demonstrate that there is a lack of knowledge among professionals regarding the duration of breastfeeding. Levinienė et al.[31] reported that the most of general practitioners and nurses did not know that breastfeeding with complementary foods should be continued until two years of age or older. In addition, more recent studies have cited that general practitioners have demonstrated negative opinions about breastfeeding up to twenty-four months[22] and almost half have recommended that children be breastfed up to twelve months[36]. It is worth mentioning that one of the studies[22] was carried out in Australia where the national health and medical research council recognizes the continuation of breastfeeding for at least twelve months, which can cause confusion regarding the professionals' guidelines and is not according to the guidelines established by the WHO.

A review of the previous literature evaluating studies with nursing mothers highlighted the factors that make breastfeeding difficult and cause early weaning, which could be: the perception of weak or insufficient milk, use of a pacifier, return to work or school, nipple fissure and pain, lack of encouragement from health professionals for exclusive breastfeeding, precarious knowledge of mothers about the importance of breastfeeding, low level of education of the mother and increasing the child's age[49]. In our results, we observed that many professionals reported at least one of these situations as a factor for not indicating or not encouraging breastfeeding[30,32,37,40,41]. However, these studies were carried out more than ten years ago and what makes us believe that a change in the knowledge regarding factors such as weak milk, nipple fissure and returning to work or school is happening. Despite this, the lack of maternal knowledge and the lack of encouragement from health professionals reported by mothers demonstrates their direct influence on the success of breastfeeding, as observed by Sims et al.[44].

Our results demonstrated a conflict of knowledge related to weaning and beginning of deciduous dentition. McLaughlin et al.[21] and Pereda et al.[39] reported that doctors and nurses do not recommend weaning when the rash starts. However, Holtzman and Usherwood[22] reported that a doctor stated he recommends that mothers wean if the baby bites while breastfeeding. The American Academy of Pediatric Dentistry (AAPD) recommends that children should be taken to the pediatric dentist at no later than your child's first birthday or when the time of the eruption of the first tooth[50]. This is an opportune time for the dentist to provide guidance on the benefits of breastfeeding, the correct weaning protocol and appropriate oral hygiene guidelines. It is known that oral health is an integral part of the general health and that child's general health care cannot be achieved if oral care is not included[51]. Despite that, none of the selected studies evaluated the knowledge of dentists about breastfeeding and weaning. That is, after the systematic search in each electronic base, none of the studies included dentists as part of the sample. Thus, it represents

a warning sign for dentists, which suggests that they are not considered by many to be professionals who work directly with such themes in their clinical practices.

An important habit reported in our results and the dentist's technical competence is the use of pacifiers. The use of pacifiers can cause a decrease in the frequency of feedings, reduced stimulation, and withdrawal of breast milk, which leads to less milk production, and consequently to weaning[52]. In addition, non-nutritive sucking habits, such as the use of pacifiers, can negatively affect the orofacial system. Scientific evidence has shown an association between the use of pacifiers and the presence of anterior open bite and posterior cross bite. So-called orthodontic pacifiers reduce the prevalence of open bite when compared to non-orthodontic pacifiers; however, it is not possible to state that orthodontic pacifiers show a positive effect on crossbite[53]. In our results, opinions about the use of pacifiers were contradictory, Levinienė et al.[31], Silvestre et al.[29] and Fonseca-Machado et al.[42] agree that pacifiers should not be recommended as it can negatively affect breastfeeding. However, more than a half of the nurses assessed by McLaughlim et al.[21] did not know that pacifiers can cause confusion in babies who are starting the breastfeeding. In addition, Szucs, Miracle and Rosenman[17] reported that some professionals advise the early use of pacifiers. These counterpoints once again demonstrate the importance of including all health professionals, involving dentists, in child health promotion programs and research on breastfeeding and weaning.

As previously highlighted, breastfeeding plays an important role in child health. In this sense, it has an extremely importance for the development of a normal dental occlusion. Studies have shown a lower proportion of malocclusion in primary dentition in children breastfed up to 12 months[54] or more[55], regardless the sociodemographic factors. Another advantage of natural breastfeeding clarified in the recent years is that breast milk alone does not cause a decrease in the biofilm pH, suggesting that breastfeeding alone may not contribute to early childhood caries[56]. In addition, a systematic review suggests that children breastfed exclusively for up to 12 months compared to those breastfed for less time were protected from tooth decay[57]. Thus, we emphasize the importance of pediatric dentistry in the care of newborns, so that risk assessments of early childhood caries should be carried out, as well as the diagnosis and early intervention of malocclusions.

Health education can be considered a process that induces behavioral change related to health, not only individual, but also collective[58]. Given the importance of the dentist highlighted here earlier, the rapprochement between pregnant women/infants and a multiprofessional health team including dentists appears to be a fundamental challenge for the beginning of a promising oral health promotion cycle for women and babies. It is essential to rethink the formation of an interprofessional prenatal work team[59]. In this context, the dentist may be part of this team, being responsible for the development of oral health education actions, where women can become aware of their important role in the acquisition of positive oral health habits and their maintenance, acting as an information multiplying agent[60]. In addition, dentists in a pre-natal team would welcome and support breastfeeding, highlighting its importance for the development of the stomatognathic system[7].

The need and lack of specific training on breastfeeding were reported by the authors[23,25] and observed in our study. We believe that this factor may have influenced the low level of knowledge of professionals, especially regarding the time and management of practical problems that may occur during the breastfeeding period. Thus, the importance of implementing breastfeeding promotion programs during the training of health professionals and effective policies to promote child health is highlighted. In addition, we emphasize the inclusion of the dentist in this context as a fundamental part of promoting the child's comprehensive health.

Conclusion

This scope review shows that health professionals with different formations are aware of the benefits of breastfeeding for the mother and the baby. However, these issues have conflicting knowledge about the exclusive breastfeeding time and the duration of breastfeeding. Moreover, despite the knowledge of the main reasons that may lead to early weaning, many professionals are trapped in barriers to promote breastfeeding.

Collaborations

MLD conduct the review, drafted, and wrote down the manuscript. Also searched the databases, evaluated the articles, collected the data and approved the version to be published; KRD carried out searches in the databases, evaluated the articles and approved the version to be published; DMTPF, a librarian experienced in systematic searches, guided the search strategy and approved the version to be published; AFG idealized the study design, critically reviewed the manuscript and approved the version to be published.

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