

How do Pediatric Dentistry and Orthodontics textbooks address the themes of breastfeeding and complementary feeding?

Lucimeire de Sales Magalhães Brockveld*; Sonia Ioyama Venâncio**

* Dental surgeon, PhD, Professor, Medical School, University City of São Paulo

** Pediatrician. Technical Director, Health Institute of the State Health Department of São Paulo

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ABSTRACT

Breastfeeding (BF) and complementary feeding (CF) contribute to the development of the stomatognathic system and prevent oral diseases such as dental caries and malocclusion. This article reports a qualitative document analysis study to check information about BF and CF in four reference books used in Dentistry undergraduate programs in Brazil, namely two Pediatric Dentistry books and two Orthodontics ones. The books were chosen because they are included as course readings in the bibliography of the two courses in six Dentistry undergraduate programs in the state of São Paulo. This research showed that in the Pediatric Dentistry books, information is found in a greater amount and is more detailed, and some of this information needs updating. In conclusion, the study literature, which supports the learning of Dentistry students, presents useful and relevant content and stimulates the search for further information. Important gaps were found in the target Orthodontics books as regards the benefits of BF and CF that can aid the prevention of oral diseases. The contents in the Pediatric Dentistry books are more complete, and the book published in 2017 is also the most updated, although some aspects still need to be aligned with new scientific evidence and with the advice of the national dietary guidelines.

Descriptors: Education, Dental. Breast Feeding. Infant Nutritional Physiological Phenomena. Health Promotion.

1. INTRODUCTION

Breastfeeding improves children's survival and health by providing protection against infections and malocclusion, reducing the occurrence of overweight and enhancing the development of human capital¹. The World Health Organization (WHO)² and the Ministry of Health of Brazil (MH)³ recommend exclusive breastfeeding (BF) for the first 6 months of life - when complementary feeding (CF) should be introduced - and continued breastfeeding until two years of life or more.

BF is an important factor for maturation and development of facial musculature, as it promotes the growth and development of the stomatognathic system (SS) and preserves its vital functions. Chewing, which starts as the first deciduous teeth erupt, requires solid, dry and fiber-rich foods to allow the correct development of the SS⁴. Another factor that can affect the muscles engaged in BF is the use of baby bottles and other types of pacifiers⁵.

Despite the benefits of breastfeeding and the increase in the frequency of this practice in Brazil, the indicators are still below those recommended by the WHO^{6,7}. As far as continued breastfeeding is concerned, data from the National Demographic and Health Survey of Children and Women (PNDS-2006) show a high frequency of children eating foods of low nutritional value, and a low frequency of children consuming fruits, meat and vegetables⁸.

It is essential that mothers, caregivers and family members receive adequate advice and support from different health workers for the practice of BF. Consequently, inadequate professional education and training is an obstacle to the desired changes. All types of health workers have substantial gaps in knowledge and skills that are required to support breastfeeding⁹.

The competencies and skills listed in the National Curriculum Guidelines (DCN)^{10,11} of

undergraduate programs in Dentistry have to be taken into account to improve the education and training of dentistry students with regard to the prevention of oral diseases attributed to BF and CF. They should be offered quality information so that they can support, promote and protect this practice, which can avoid negative outcomes in children from all levels of income.

For the above-mentioned reasons, the objective of this study is to check how Pediatric Dentistry and Orthodontics textbooks have addressed the topics BF and CF.

2 METHODS

This article reports part of the results of the doctoral thesis of the main author, who evaluated undergraduate programs in Dentistry under the theoretical framework of the National Curriculum Guidelines^{10,11}, focusing on the teaching of BF and CF.

It is a qualitative study using document analysis. The use of documents in research enables information retrieval; thus, one can further comprehend objects that need historical and sociocultural contextualization in order to be understood¹². According to Bravo¹³, documents are all the achievements produced by man that are evidence of his action and that can reveal his ideas, opinions and ways of acting and living.

The selection of the study documents was based on the course descriptions of six undergraduate Dentistry programs: three from public institutions (School of Dentistry of Araraquara, São Paulo State University "Júlio de Mesquita Filho"/UNESP; School of Dentistry, University of São Paulo/FOUSP; and School of Dentistry of Piracicaba, State University of Campinas/FOP-UNICAMP) and three from private institutions (Methodist University of São Paulo/UMESP, Universidade Paulista/UNIP and Universidade Cidade de São Paulo/UNICID). The choice of these courses was based on the

annual evaluation of higher education in Brazil by the newspaper Folha de São Paulo¹⁴. At this ranking, 195 public and private Brazilian universities are classified according to five indicators: research, internationalization, innovation, education and market.

The books most frequently mentioned were: *Ortodontia* (“Orthodontics”)¹⁵ (book I), *Ortodontia - Diagnóstico e Planejamento Clínico* (“Orthodontics - Diagnosis and Clinical Planning”)¹⁶ (book II), *Odontopediatria* (“Pediatric Dentistry”)¹⁷ (book III) and *Odontopediatria na Primeira Infância – uma visão multidisciplinar* (“Pediatric Dentistry in Early Childhood - a multidisciplinary view”)¹⁸ (book IV).

All four books were read in full by the main researcher. The analysis was based on seeking content relative to the themes “Breastfeeding as the healthiest food choice”; “Exclusive breastfeeding in the first 6 months of life”; “Continued breastfeeding for 2 years or more”; “Breastfeeding as a promoter of SS development”; “Complementary feeding as an inducer of SS development”; and “Bad oral habits and the development of oral diseases”.

3 RESULTS AND DISCUSSION

The four books analyzed are classics of the dental literature and, as such, they are references for undergraduate and graduate students as well as working professionals. The most recent editions of each book were used, with dates ranging from 1991 to 2017.

Book III¹⁷ has an entire topic for BF in chapter 27, which shows its benefits for children’s health and emphasizes the importance of breastfeeding-promoting measures. Book IV¹⁸ is the only one that has an entire chapter for the topic, in addition to addressing it in several other chapters. It is the book in which BF and CF are

addressed most often.

The Pediatric Dentistry books recommend that BF is the healthiest food choice, and it should be exclusive for six months and continued for two years or more. The orthodontics books do not mention anything about these guidelines, as shown in figure 1.

The correct advice for BF up to two years or more is present in chapters 6, 9, and 10 of book IV¹⁸. However, chapter 11 presents information about the physiological opportunity to remove the sucking habit: “... *in this phase (7-8 months of life), the use of pacifiers is discontinued and the transition from the breast to glasses occurs smoothly*” [our translation].

The development of the SS and the physiology of breastfeeding are described in detail in the Pediatric Dentistry books, but only briefly in the Orthodontics books. The texts of the Pediatric Dentistry books also present the benefits of BF for children’s health, the development of the mother-baby bond, the advantages for the mother’s health and the benefits for society as a whole.

On the subject of introduction of adequate CF to continue inducing the development of facial structures, the Pediatric Dentistry books address the need for guidance to parents and thoroughly explain the importance of properly stimulating chewing. Book II¹⁶ briefly mentions the development of chewing by consuming more solid foods (figure 2).

The evidence contained in the books makes it clear that breastfeeding is a decisive and essential factor for correct maturation and growth of structures, thereby keeping them able to exercise the development of the orofacial muscles. These muscles, in turn, support and stimulate the development of physiological functions, ensuring not only survival but also a better quality of life⁴.

Figure 1. Examples of quotes in the books on recommendations regarding BF [our translation]

	Book I ¹⁵	Book II ¹⁶	Book III ¹⁷	Book IV ¹⁸
BF as the healthiest choice	None	None	“Numerous studies have confirmed the benefits of breastfeeding for children’s health, and emphasized the importance of measures that can promote breastfeeding.” (Chapter 27)	“Breastfeeding is the most positive affective bond in the mother-child relationship, as it not only guarantees adequate psycho-emotional development, but also impacts maternal and child health indicators throughout life.” (Chapter 9) “Nothing is better for a child than breastfeeding. Natural breastfeeding is ideal for the newborn because, in addition to the fact that breast milk is modulated for the baby and supplies its needs up to the 6th month of life, it also provides antibodies against various diseases, has a role in gastrointestinal maturation and in increasing neurobehavioral performance, promotes better cognitive and psychomotor development and results in a lower incidence of hospital readmissions.” (Chapter 10)
EBF 6 months	None	None	“Exclusive breastfeeding for children up to 6 months of age should be encouraged, and there is no need for food supplementation, not even tea or water, during this period.” (Chapter 27)	“The Ministry of Health of Brazil (MH) follows the guidelines of the World Health Organization (WHO), and recommends exclusive breastfeeding (EBF) up to 6 months, extended to 2 years of life. This practice is of fundamental importance for the survival, growth and development of infants.” (Chapters 6, 9, 10, 11)
CBF 2 years	None	None	None	“The WHO and the MH of Brazil recommend continued breastfeeding until 2 years of age in parallel with the introduction of balanced complementary feeding.” (Chapters 6,9,10)

BF: Breastfeeding; EBF: Exclusive Breastfeeding; CBF: Continued Breastfeeding.

Figure 2. Quotes found in the books about BF and CF in terms of SS development [our translation]

	BF as promoter of SS development	CF as an inducer of SS development
Book I¹⁵	“Infant swallowing, an essential function in the newborn, is closely associated with breastfeeding, and they are both well developed around the 32nd week of intrauterine life”. (Chapter 5)	None
Book II¹⁶	“[...]when sucking is performed on the mother’s breast, it promotes greater development and maturation of the perioral muscles.” (Chapter 13)	“The transition from infant to mature swallowing occurs after a few months, aided by the maturation of neuromuscular elements, [...] the instinctive desire to chew, the need to use more solid foods, tooth development, etc.” (Chapter 5)
Book III¹⁷	“The muscle movements for milking the breast are intense and prepare the muscles to perform a good masticatory function in the future.” (Chapter 5)	“The pattern of infant feeding has been changing with the substitution of most natural foods with processed ones ... that do not stimulate chewing, which is essential for the balance of occlusal development and the prevention of dental caries.” (Chapter 27)
Book IV¹⁸	“Nutritive sucking, especially natural sucking, favors the growth and development of the mandible and the maxillae, as well as the labial and lingual muscles, the maintenance of the nasal breathing mode, the occlusal balance and the remodeling of the temporomandibular joints” (Chapter 3) “Breastfeeding is essential, as it will promote the anterior seal of the oral space when the child closes its lips for apprehension of the breast, with its lips everted, stimulating the activity of the perioral muscles.” (Chapter 8)	“When food transition is carried out correctly in early childhood, with an orderly introduction of different food consistencies and textures, the balanced development of orofacial structures and functions as well as health in general are favored.” Chapter 3 “Inadequate food transition in the first year of life may cause changes in nutritional status and oral health by impairing SS development.” (Chapter 6) “The introduction of solid foods in the diet requires specific guidelines in the field of dentistry, given the importance of establishing masticatory function by encouraging more consistent, fiber-rich and dry foods.” (Chapter 14)

BF: Breastfeeding; SS: Stomatognathic System; CF: Complementary Feeding.

The correct introduction of food in the baby's diet from six months of age improves the baby's health and continues to encourage the proper development of oral structures depending on the quality and texture of the foods offered.

The consumption of processed and ultra-processed foods, as mentioned in Book III¹⁹, is a matter of concern because the intake of such foods tends to limit the consumption of fresh or minimally processed food. In addition, it is linked to excessive consumption of calories, salt and fats¹⁷.

The books strongly relate the development of oral habits to all kinds of changes in the development of oral structures. Habits are complex in nature and characterized by constancy and repetition, and they become unconscious. Lack of breastfeeding after introduction of bottles is one of the causes of acquisition of oral habits, causing structural and functional changes that lead to malocclusion⁴.

Data from National BF Prevalence Surveys show that the use of pacifiers is strongly associated with early discontinuation of exclusive BF in Brazil²⁰.

Guidance on the use of orthodontic pacifies appears in chapter 13 of Book II¹⁶. Bishara *et al.*²¹ claim that few scientific data substantially prove the existence of any advantage in the use of orthodontic pacifiers. The result of a systematic review showed that there are no significant differences between orthodontic and conventional pacifiers regarding implications for the SS, although the researchers indicated the need for further studies on the subject²². Evidence shows that the use of pacifiers of any type is the most frequent cause of low rates of BF²³.

In the analyzed texts, there are messages that can make students (especially undergraduate ones) insecure when providing advice on breastfeeding, as shown in figure 3.

Figura 3. Example of quotations found in the books that discourage BF

Book II ¹⁶	<i>"However, for various reasons, it is difficult for mothers to be able to breastfeed nowadays."</i> (Chapter 13)
Book III ¹⁷	<i>"Some authors claim that the child's need of sucking and respective sucking reflex persist until its second year of life. However, from the sixth month of life onwards, gradual weaning is advisable".</i> (Chapter 27)

Women should be informed about the advantages of exclusive breastfeeding and the disadvantages of early introduction of other foods and receive support from family members, community members, colleagues, seasoned health workers and society in general. Coordinated initiatives and public policies that respect the rights of women and children, help mothers prepare for and be capable of breastfeeding.

Information that needs updating

Textbooks are updated on a regular basis, but some information becomes out of date in

view of the emergence of new research and new scientific evidence. Some guidelines found in the books need updating because new evidence has emerged.

In terms of food preparation, on the occasion of food introduction, book III¹⁷ (chapter 27) recommends that soups should be sieved. According to the revised edition of the *Guia Alimentar para crianças brasileiras menores de dois anos* ("Dietary Guidelines for Brazilian children under two years of age")²⁴, solid foods should be introduced at six months of age. Moreover, liquid diets and the use of blenders, mixers and sieves should be avoided. Ideally, the

child should be fed food mashed with a fork and then progress to food chopped into small pieces, scraped or shredded.

Maneuvers to enlarge and strengthen the nipples during pregnancy, as advised in chapter 40 of book III¹⁷, are not recommended anymore because pregnancy itself can provide favorable conditions for breastfeeding.

To avoid nipple fissure, the *Caderno de Atenção Básica (CAB) 23* (“Primary Care Handbook”)³ proposes procedures such as: breastfeeding with an adequate technique (especially the attachment), keeping the nipples dry, avoiding products that remove the natural protection of the nipple (e.g., soaps) and breastfeeding on demand. Chapter 6 of Book IV¹⁸ provides adequate information when it recommends that the child should suck the mother’s breast freely, without time limits. However, chapter 5 emphasizes that each feeding must last for exact 15 minutes on each side. The same chapter states that free demand prevents the baby from sucking hard and that the stronger the suction, the more suitable the mother’s milk is. According to CAB 23, time spent on the breast at each feeding should not be fixed, because the breast should be properly emptied, and this is different for each mother-baby pair.

A controversial subject that is addressed throughout book IV¹⁸ is cleaning the baby's oral cavity before the first tooth erupts. Chapters 10, 16 and 18 offer instructions on how to clean the oral cavity of newborns with gauze soaked in saline or with a specific oral hygiene solution, after they have been fed. In Chapter 18, it is stated that cleaning the oral cavity of toothless babies seems unnecessary because their cavity does not have niches that could favor the retention of microorganisms associated with dental caries and periodontal disease. Breast milk forms a layer of immunoglobulins throughout the oral mucosa that protects this pathway from a

series of diseases, and its removal with gauze / cloth soaked in saline / filtered or boiled water reduces the protection offered to the baby²⁵.

Content analysis of the books indicated as course readings to undergraduate students in Dentistry programs, in the Pediatric Dentistry and Orthodontics courses, clarifies what kind of support is offered to students in addition to the classes, as far as the target topics are concerned.

The intention of the present study was to encourage an increasingly higher number of textbooks and scientific articles to highlight the importance of healthy BF and healthy CF for better overall health and oral health of children and their families. Another objective was to raise the awareness of future and present dentists about their responsibility as health workers in providing correct information and handling daily practices better.

There are gaps to be filled, particularly by the Orthodontics books, in the sense of shifting the paradigm from restoration to that of health promotion and prevention of oral diseases. Update must be sought more and more in accordance with scientific evidence and ministerial guidelines.

This is the first analysis of this nature of the target subjects, and it brings contributions to the improvement of the Orthodontics and Pediatric Dentistry books used by Dentistry students.

A limitation of this study was the selection of books for review, which was based on the fact that they were indicated as course readings. Admittedly, there may be more up-to-date and accurate information in other books assigned as course readings. Future research should broaden knowledge of this topic and promote further debate.

4 CONCLUSIONS

In conclusion, the study literature, which supports the learning of Dentistry students,

presents useful and relevant content and stimulates the search for further information. Important gaps were found in the target Orthodontics books as regards the benefits of BF and CF that can aid the prevention of oral diseases. Contents in the Pediatric Dentistry books are more complete, and the book published in 2017 is also the most updated, although some aspects still need to be aligned with new scientific evidence and with the advice of the national dietary guidelines.

RESUMO

Como os livros-texto de Odontopediatria e Ortodontia abordam os temas aleitamento materno e alimentação complementar?

O aleitamento materno (AM) e a alimentação complementar (AC) contribuem para o desenvolvimento do sistema estomatognático e evitam doenças bucais como a cárie e maloclusão. Este artigo apresenta um estudo qualitativo de análise documental para verificar as informações sobre AM e AC em quatro livros de referência para a graduação em Odontologia no Brasil, sendo dois livros de Odontopediatria e dois de Ortodontia. Os livros foram escolhidos por indicação na bibliografia destas duas disciplinas em seis cursos de Odontologia do estado de São Paulo. A pesquisa demonstrou que as informações estão em maior quantidade e profundidade nos livros de Odontopediatria e algumas necessitam de atualização. Conclui-se que a literatura estudada, de apoio ao aprendizado do estudante de Odontologia apresenta conteúdo útil e pertinente e serve como disparador para novas buscas. Lacunas importantes foram identificadas nos livros de Ortodontia analisados em relação aos benefícios do AM e AC que podem contribuir para a prevenção de doenças bucais. Os livros de Odontopediatria trazem conteúdo mais completo, sendo que o livro publicado em 2017 é também o mais atualizado, embora alguns aspectos necessitem ainda de alinhamento com as novas evidências científicas e com as orientações dos guias alimentares nacionais.

Descritores: Educação em Odontologia. Aleitamento Materno. Fenômenos Fisiológicos da Nutrição do Lactente. Promoção de Saúde.

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Correspondence to:

Lucimeire de Sales Magalhães Brockveld
e-mail: lucimeirebrockveld@gmail.com
Rua Prof. Monjardino, 130 - 84B Vila Sônia
05625-160 São Paulo/SP Brazil