

KNOWLEDGE OF MEDICAL STUDENTS ABOUT MATERNAL BREASTFEEDING

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Abstract: Breastfeeding (BF) is fundamental for the development of the child and promotion of the affective bond between mother and child. In view of this, it is essential that medical students know how to advise on the subject, in order to stimulate BF, therefore, this study aimed to identify their knowledge in relation to knowledge, guidelines and BF management. Cross-sectional study with 252 medical students from a private university, carried out in the 2nd semester of 2021 and the 1st semester of 2022. The students answered a questionnaire that investigated seven domains that evaluated knowledge and experience about BF. The Stata Program, version 16.0, was used in the statistical analyses. Chi-square test was applied to verify differences between students without prior knowledge about BF (<7th period) and those with prior knowledge (>7th period). It was observed that students with prior knowledge obtained 65.0% (95%CI 56.2% - 73.0%) of performance in the item general knowledge about BF, while students without knowledge had 13.2% (95%CI 8.3% - 20.2%). The subject with the best performance in both groups, with no statistically significant difference, was BF effectiveness (96.0%; 95%CI 92.8 - 97.8). The content with the worst performance was expression of breast milk, where 10.8% (95%CI 6.5 - 17.5) of students without prior knowledge and 16.3% (95%CI 10.7 - 23.9) with knowledge got better score. In view of the results obtained, it was concluded that students from the 7th to the 12th period obtained average knowledge about the subject, but much higher than the students from the initial periods, even with poor performance in the expression of breast milk domain.

Keywords: knowledge; breastfeeding; students; attitude; medicine.

INTRODUCTION

BF is the best natural way to offer food to the

baby, with importance in creating an affective bond between the child and the mother and in preventing infant mortality. Human milk has nutritional and immunological properties with effects that affect the individual's entire life, such as protection against overweight, diabetes and a lower risk of infections in childhood and adulthood (VICTORA et al., 2016).

Studies show an increase in the number of mothers who breastfed when they were taught and informed about BF (MCFADDEN et al., 2017), which reveals the medical influence in promoting breastfeeding. In this sense, the support given by health professionals, including medical students, in relation to the promotion of BF, is essential to encourage and encourage mothers in this process (FRAZÃO et al., 2019).

However, there are few studies investigating students' knowledge of BF. A cross-sectional study carried out with final year medical and dental students in Malaysia found that most students had erroneous knowledge about the subject, such as, for example, believing that powdered milk could be given to babies if they appeared hungry (MOHAMAD et al., 2019). A study carried out with 75 medical students from the Educational Foundation of the Municipality of Assis (FEMA) observed that there are learning gaps in some topics related to breastfeeding. The questionnaire used for evaluation showed that students have greater difficulty in handling recurrent situations in breastfeeding, and showed high rates of errors regarding breastfeeding technique and milk function (MARQUEZINE et al., 2021).

To investigate this issue, this study assessed medical students' knowledge about BF to identify gaps in knowledge on the subject, in order to provide comprehensive measures to improve teaching to medical students about BF practices.

MATERIAL AND METHODS

Cross-sectional study carried out with medical students, from the 1st to the 12th period, from a Higher Education Institution (HEI) located in the Metropolitan region of Espírito Santo. The IES was inaugurated in 1976 and has 12 courses in the health area, having received a university title in 2011. The medical course was implemented 15 years ago and uses problem-based learning (PBL) as a pedagogical methodology.

The subject of pediatrics is taught in the last module of the sixth period of the course, in which the student learns basic, theoretical and practical notions on mannequins for BF training. Later, before joining the pediatric internship, the student receives a course from the Ministry of Health on BF, with a workload of 20 hours, divided into theoretical and practical classes carried out in the human milk bank.

To calculate the sample size, the OpenEpi software, available free of charge, with the corrected Fleiss method was used. A sample was estimated for comparing two groups, assuming that group 1, which did not receive training, would get up to 50% of the answers right and group 2, which received training, would get more than 80% of the answers right, considering a bilateral alpha error of 5% and 80% power. Adding 10% for losses and refusals, it was estimated that 73 students would be needed in group 1 and 37 in group 2.

The sample selection was random, carried out in the second half of 2021 and the first half of 2022, totaling 129 students up to the sixth period and 123 from the seventh to the 12th periods.

Data were collected directly from medical students, individually and anonymously, in a single moment, through a questionnaire containing questions used in a similar study with medical and dental students at a university in Malaysia (MOHAMAD

et al. 2019). Contact was made with the researchers who sent the research form, which was translated into Portuguese and validated through a pre-test, before using it in the research. The questionnaire has sociodemographic information, previous experience, previous and current knowledge about BF. The questionnaire was scanned and sent via email to the participant selected for the survey, who answered it online.

The sociodemographic characteristics investigated were: gender (male; female), age (<20; 20 to 25; >25); marital status (single; married; union), graduation time (period and year), previous graduation (yes; no), area of knowledge of the previous graduation (biological and agricultural sciences; health and human sciences; social sciences; exact sciences and engineering). Regarding BF, the following variables were analyzed: previous knowledge about BF (yes; no) and experience with BF (yes; no).

Seven domains about BF knowledge were evaluated: (1) understanding about exclusive breastfeeding (EBF) with four questions; (2) BF advantages for the child with 10 questions; (3) advantages of BF for the mother with four questions; (4) problems with AM with five questions; (5) AM duration with two questions; (6) expression of breast milk with five questions; (7) effective feeding with three questions. Three answer options were given for each question used in the seven domains: yes, no and I don't know. A score of "1" was assigned to the answer "yes", and a score of "0" was given to "no" and "don't know".

Data were entered and analyzed using the statistical program Stata version 16.0 (StataCorp LP, CollegeStation, United States). Categorical variables were presented as absolute and relative frequencies and continuous variables as mean and standard deviation. The chi-square test was used to verify differences between students who

had previous knowledge about BF (yes; no) and among students trained according to the graduation period (<7; >7) in relation to each domain. A score of correct answers >75% was considered for knowledge about EBF and benefits of BF for the mother, >80% for advantages for the child, problems with BF, expression of breast milk and general knowledge about BF, >50% for duration of AM and >66.7% for effective feeding.

The study was approved by the Scientific Research Ethics Committee (CEP), under opinion number 4,788,958. After reading and signing the Free and Informed Consent Term (TCLE), the questionnaire was released for the participant to answer.

RESULTS

In total, 252 medical students participated in the study. Sociodemographic characteristics, previous knowledge and experience with BF are described in Table 1 (Table 1). The majority were women (63.1%), aged between 20 and 25 years (61.5%), single (94.4%), with an average of 3.5 years of study (SD 1.7), being in the first graduation (89.3%) and, those with previous graduation, the predominance was in the areas of social sciences (33.3%) or exact and engineering (33.3%). Just over half had prior knowledge about BF (54.0%) and had no experience with BF (97.2%).

Of the 33 questions that assessed knowledge about BF, only nine obtained more than 80% correct answers. Regarding knowledge about EBF, of the four questions analyzed, the only one with more than 80% was about EBF being provided up to six months of life (86.9%). Regarding the advantages of BF for the child, of the 10 questions that evaluated this domain, the questions with the highest scores were: breast milk provides complete nutrition (96.0%), breast milk provides more protection against allergies than artificial milk (97.6%), breast milk helps in the development

of teeth and gums (84.5%) and breastfeeding encourages mother-child interaction (97.2%). The only domain in which all questions had more than 80% correct answers was the one that assessed knowledge about effective eating. In this domain, 95.2% agreed that the baby gains weight with effective feeding, 97.2% agreed that correct positioning helps with effective BF and 90.1% agreed that the baby sleeps better after adequate BF. The domains where no question obtained more than 80% agreement were those that evaluated the benefits of breastfeeding for the mother, problems with breastfeeding, duration of breastfeeding and expression of breast milk (Table 2).

Overall, only 38.5% of the students reached a score greater than 80% on the questions that assessed general knowledge about BF, with 61.0% of students having prior knowledge about BF and 12.1% without prior knowledge ($p < 0.001$). Regarding the domains of knowledge, significant differences were observed in the majority, except in the domain that evaluated the expression of breast milk ($p = 0.810$). In most domains, students who already had prior knowledge about breastfeeding obtained more than 80% correct answers, when compared to students without prior knowledge, such as in the domains about the advantages of breastfeeding for the child (87.5% vs. 46.5%; $p < 0.001$) and for the mother (85.3% vs. 37.1%; $p < 0.001$), the duration of BF (96.3% vs. 53.4%; $p < 0.001$) and in effective feeding (98.5% vs. 93.1%; $p = 0.028$). The domain with less knowledge was the one that evaluated problems with BF, where 68.4% of students with prior knowledge got more than 80% of the questions correct versus 16.4% of students without knowledge ($p < 0.001$) (Table 3).

Table 4 presents the analysis of students' knowledge up to the sixth period of the course (group 1), compared to those from

the seventh period onwards (group 2). Only 13.2% of students in group 1 scored above 80% in general knowledge in BF, compared to 65.0% in group 2 ($p < 0.001$). Group 2 obtained more than 80% agreement in five domains, while group 1 only had such performance in the effective eating domain (98.4% vs. 93.8%; $p = 0.063$, respectively). The other four domains that group 2 scored above 80% were: knowledge about EBF (80.5% vs. 48.8%; $p < 0.001$), advantages of BF for the child (87.0% vs. 51.2%; $p < 0.001$) and for the mother (86.2% vs. 41.1%; $p < 0.001$) and BF duration (97.6% vs. 56.6%; $p < 0.001$). In two domains, group 2 did not achieve satisfactory performance. One of them was the one that evaluated problems with BF, but its result was better than in group 1 (72.4% vs. 17.8%; $p < 0.001$). As for the domain that evaluated the expression of breast milk, both groups presented performance close to and well below expectations, which was a score above 80% (group 1: 10.8% vs. group 2: 16.3%; $p = 0.209$).

DISCUSSION

Just over a third of medical students had general knowledge about AM. Those who had greater knowledge on the subject were students who had already received some training, that is, those who were above the sixth period of graduation and those who reported having received some knowledge about BF.

The World Health Organization (WHO) and the United Nations Fund (UNICEF) recommend EBF until the sixth month of life and continued until the age of two, when it will be supplemented with other foods (YANG et al., 2018). However, such a recommendation is not correctly adopted, given that, although the majority of the population is aware of this information, many believe that the child on EBF must receive complementary feeding, either through soft or solid foods. Proof of this

is that, in line with WHO data, worldwide, only 40% of babies younger than 6 months receive EBF (WHO, 2003). And to reverse this reality, WHO has included breastfeeding in its global nutrition goals (WHO, 2003). In this study, more than 86% of students knew that BF had to be exclusive until the sixth month, but 75% believe that it must not be supplemented at this age.

Well-trained health professionals have the power to encourage EBF, by correctly instructing mothers and thus making breastfeeding more effective and lasting (VICTORA et al., 2016). Just over 60% of students knew all the advantages of breastfeeding for the child. Breastfeeding protects against diarrhea, respiratory infections, otitis and allergies (allergy to cow's milk protein, atopic dermatitis, among others), in addition to the fact that breast milk reduces the risk of hypertension, high cholesterol and diabetes, and is the main source of proteins, fats and vitamins for nutrition and strengthening of the baby (BRASIL, 2015). Almost half of the students did not know that BF increases the baby's intelligence and many were not aware that breastfeeding reduces the risk of infections in the child, such as gastroenteritis and otitis, and that its effect can be in the long term, in reducing the risk for obesity and diabetes.

In addition to the numerous advantages for the child, BF brings benefits to the mother. Just over half of the students knew that BF stimulates uterine contractions, helps with maternal weight loss and reduces the chance of women having breast cancer. It is estimated that the risk of developing breast cancer decreases by 4.3% for every 12 months of breastfeeding duration (BRASIL, 2015). In addition, breastfeeding is attributed to protection against other diseases in women such as type 2 diabetes, hypercholesterolemia, hypertension, obesity,

osteoporosis, postpartum depression and ovarian cancer (BRASIL, 2015). In addition, it is worth mentioning the psychological benefits for the child and the mother, which are provided by the affective bonds generated in the breastfeeding process (BRASIL, 2015).

However, many women do not breastfeed their children because they are not well oriented during pregnancy and the puerperal period regarding problems that may arise during breastfeeding. Just over half of the students knew that a woman does not need to stop breastfeeding if she has breast engorgement or if the child is sick or has jaundice. That is why it is crucial that professionals are qualified, because with their support, mothers feel safer to breastfeed and are able to have better results promoting adherence to appropriate BF for the baby (CRICCO-LIZZA, 2006). Almost 25% of the students who answered the questionnaire believed that breast size has an influence on milk production, which is known to be unrelated. Regardless of breast size, breastfeeding is feasible (BRASIL, 2015). Given this, the importance of good preparation of these students is reflected in favor of good information given to women from prenatal care.

Studies with health professionals identify that they play an important and effective role in addressing breastfeeding (DUARTE et al, 2022). Although professionals report that they receive guidance on the benefits of breastfeeding in courses, practical training on breastfeeding techniques is assessed as insufficient. Thus reaffirming that the estimated courses are engaged with the type of baby feeding and not with the practice of breastfeeding itself (DUARTE et al, 2022).

The decline in the practice of BF that occurred at the end of the 19th century, a consequence of beliefs about breastfeeding, the insertion of women in the labor market, the influence of hospital practices

contrary to breastfeeding on demand, the industrialization of products and the creation of demands influenced by the marketing used by industries and distributors of artificial foods, they had an important impact on infant mortality (BRASIL, 2017). Therefore, the Ministry of Health established as a public policy to encourage BF the creation of support rooms for working women who breastfeed (BRASIL, 2010). These rooms, created in the workplace, facilitate the extraction and storage of breast milk, so that the woman can collect it at the workplace and take it home, which will serve to feed the child (BRASIL, 2010). This practice must be encouraged and guided by health professionals. However, in this study, less than 15% of students were aware of this practice and less than half knew that expressed breast milk can be stored in the freezer or freezer. Breast milk can be stored in the freezer or freezer for up to 15 days and heated in the microwave (BRASIL, 2015).

The students showed excellent learning about the effectiveness of breastfeeding, demonstrating knowledge about the correct positioning of the baby and the mother during breastfeeding, which is extremely important in proper nutrition, as it influences the child's weight gain and sleep. To ensure a health structure prepared to accommodate women at this stage, the World Health Organization (WHO) and the United Nations Children's Fund (Unicef), prepared "Ten Steps to Successful Breastfeeding". This document includes content on public care policies, professional qualification, guidance for pregnant and puerperal women, in addition to offering support services, which is very interesting for distributing information and qualification on the subject, ensuring not only BF, but also humanized care for women and children (WHO, 2003).

The results of this study show that students who have some knowledge about BF or who

received BF training at graduation have a greater understanding of the importance of BF, its advantages and the problems that may arise during this practice. Incorrect information provided to the woman during pregnancy and lactation can compromise the success of BF. In this sense, the lack of information about management and previous experience with breastfeeding is correlated with the presence of nipple fissures and breast engorgement, which are the main causes of pain and abandonment of BF (ABREU et al., 2013). Therefore, students must be able to encourage the practice of AM since graduation and this will only be possible through training and practical training for students in the health area.

CONCLUSIONS

It can be concluded that, when trained, medical students have greater knowledge

about BF practices. However, even after the Pediatrics module, there are still gaps on the subject, especially in relation to the removal and storage of breast milk. However, in view of the practical performance of medical students in the community since the first period, it is suggested that there be an approach to the subject from the beginning of graduation, in order to train the student continuously during the course and improve their practice in providing adequate instruction to women about BF.

INTEREST CONFLICTS

The authors declared that there are no conflicts of interest.

FINANCING

Scientific initiation scholarship from ``Universidade de Vila Velha`` (Edict Number: 8/2021).

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Variable	N (%)
Sex	
Masculine	93 (36,9)
Feminine	159 (63,1)
Age years)	23,1±4,4
<20	41 (16,3)
20 - 25	155 (61,5)
>25	56 (22,2)
Marital status	
Single	238 (94,4)
Married	10 (4,0)
Unity	4 (1,6)
Year of Graduation	3,5+1,7
1º	47 (18,6)
2º	36 (14,3)
3º	46 (18,2)
4º	39 (15,5)
5º	40 (15,9)
6º	44 (17,5)
Previous graduation	
Yes	27 (10,7)
Not	225 (89,3)
Area of knowledge of the previous graduation	

Biological and agricultural sciences	3 (11,1)
Health and human sciences	6 (22,3)
Social Sciences	9 (33,3)
Exact sciences and engineering	9 (33,3)
Prior knowledge about AM	
Yes	136 (54,0)
Not	116 (46,0)
Experience with AM	
Yes	7 (2,8)
Not	245 (97,2)

AM: maternal breastfeeding.

Table 1. Sociodemographic characteristics, knowledge and experience with BF by medical students (n=252).

Variable	Correct answer	incorrect answer	Do not know
Knowledge about exclusive breastfeeding			
AME is up to 6 months of life	219 (86,9)	16 (6,3)	17 (6,8)
Porridge or solid food must be after 6 months of life	185 (73,4)	44 (17,5)	23 (9,1)
Complementary food must not be provided to the child on AME during the first 6 months of life	189 (75,0)	28 (11,1)	35 (13,9)
Formula can be given to the baby after the first 6 months of life if the baby still seems hungry after breastfeeding	63 (25,0)	125 (49,6)	64 (25,4)
Advantages of BF for the child			
Breastfeeding reduces the risk of lung infection in babies	228 (90,5)	2 (0,8)	22 (8,7)
Breastfed children have less diarrhea	189 (75,0)	12 (4,8)	51 (20,2)
Breastfed children have less otitis	173 (68,6)	11 (4,4)	68 (27,0)
Breastfeeding increases the baby's intelligence	148 (58,7)	47 (18,7)	57 (22,6)
Breast milk provides complete nutrition according to the baby's needs	242 (96,0)	5 (2,0)	5 (2,0)
Breast milk provides the baby with more protection against allergies compared to artificial milk	246 (97,6)	0 (0,0)	6 (2,4)
Breast milk helps baby's teeth and gums develop	213 (84,5)	1 (0,4)	38 (15,1)
Breastfeeding reduces the risk of developing obesity	193 (76,6)	12 (4,8)	47 (18,6)
Breastfed children are less likely to develop type 2 diabetes	180 (71,4)	11 (4,4)	61 (24,2)
Breastfeeding stimulates the baby's interaction with the mother	245 (97,2)	1 (0,4)	6 (2,4)
Advantages of BF for the mother			
Breastfeeding helps stimulate uterine contractions	163 (64,7)	14 (5,5)	75 (29,8)
Breastfeeding Moms Reach Pre-Pregnancy Weight Faster	171 (67,8)	8 (3,2)	73 (29,0)
Frequent breastfeeding can prevent breast engorgement	198 (78,6)	4 (1,6)	50 (19,8)
Breastfeeding reduces a woman's chances of developing breast cancer	154 (61,1)	21 (8,3)	77 (30,6)
Problems with breastfeeding			
Breast milk production is not influenced by breast size	191 (75,8)	28 (11,1)	33 (13,1)
Mothers with inverted nipples can breastfeed their babies	156 (61,9)	12 (4,8)	84 (33,3)

There is no need to stop breastfeeding if the mother has breast engorgement	132 (52,4)	33 (13,1)	87 (34,5)
There is no need to stop breastfeeding if the baby has jaundice	131 (52,0)	24 (9,5)	97 (38,5)
There is no need to stop breastfeeding if the mother or child is sick.	135 (53,6)	52 (20,6)	65 (25,8)
Duration of breastfeeding			
Breastfeeding must begin within 30 minutes of birth	129 (51,2)	35 (13,9)	88 (34,9)
Breastfeeding must be given on demand	178 (70,6)	38 (15,1)	36 (14,3)
Expression of breast milk			
Expressed breast milk can be stored for 3 months in a freezer or freezer	98 (38,9)	91 (36,1)	63 (25,0)
Expressed breast milk can be stored for 24-48 hours in a lower part of the refrigerator	136 (54,0)	57 (22,6)	59 (23,4)
Expressed breast milk can be heated in a water bath	197 (78,2)	8 (3,2)	47 (18,6)
Expressed breast milk can be heated in the microwave	33 (13,1)	150 (59,5)	69 (27,4)
Leftover expressed breast milk can be stored to be used again	63 (25,0)	134 (53,2)	55 (21,8)
Effective feeding			
Baby gains weight if given effective breastfeeding	240 (95,2)	2 (0,8)	10 (4,0)
Correct positioning helps achieve effective breastfeeding	245 (97,2)	1 (0,4)	6 (2,4)
Baby sleeps well after receiving adequate breastfeeding	227 (90,1)	4 (1,6)	21 (8,3)

AM: breastfeeding. AME: exclusive breastfeeding. Values presented in absolute and relative frequency.

Table 2. Knowledge about breastfeeding (n=252).

Variables	Total	AM knowledge		Value p
		Yes	Not	
Knowledge about AME*	162 (64,3%)	105 (77,2%)	57 (49,1%)	<0,001
Advantages of BF for the child@	173 (68,6%)	119 (87,5%)	54 (46,5%)	<0,001
Advantages of BF for the mother*	159 (63,1%)	116 (85,3%)	43 (37,1%)	<0,001
Problems with AM@	112 (44,4%)	93 (68,4%)	19 (16,4%)	<0,001
Duration of AM#	193 (76,6%)	131 (96,3%)	62 (53,4%)	<0,001
Expression of breast milk@	34 (13,5%)	19 (14,0%)	15 (12,9%)	0,810
Affective eating&	242 (96,0%)	134 (98,5%)	108 (93,1%)	0,028
General knowledge about AM@	97 (38,5%)	83 (61,0%)	14 (12,1%)	<0,001

AM: breastfeeding. AME: exclusive breastfeeding. Correct answers: *>75%; @>80%; #>50%; &66.7%.

Chi-square test.

Table 3. Proportion of correct answers by participants with and without prior knowledge about breastfeeding (n=252).

Variables	Total	Period of graduation		Value p
		<7	≥7	
Knowledge about AME *	64,4 (58,1 - 70,0)	48,8 (40,3 - 57,4)	80,5 (72,5 - 86,6)	<0,001
Advantages of BF for the child@	68,6 (62,6 - 74,1)	51,2 (42,5 - 59,7)	87,0 (79,8 - 91,9)	<0,001
Advantages of BF for the mother*	63,1 (56,9 - 68,8)	41,1 (32,9 - 49,8)	86,2 (78,8 - 91,2)	<0,001
Problems with AM@	44,4 (38,4 - 50,7)	17,8 (12,1 - 25,4)	72,4 (63,8 - 79,6)	<0,001
Duration of AM#	76,6 (70,9 - 81,4)	56,6 (47,9 - 64,9)	97,6 (92,7 - 99,2)	<0,001
Expression of breast milk@	13,5 (9,8 - 18,3)	10,8 (6,5 - 17,5)	16,3 (10,7 - 23,9)	0,209
Effective feeding&	96,0 (92,8 - 97,8)	93,8 (88,0 - 96,9)	98,4 (93,7 - 99,6)	0,063
General knowledge about AM@	38,5 (32,6 - 44,7)	13,2 (8,3 - 20,2)	65,0 (56,2 - 73,0)	<0,001

AM: breastfeeding. AME: exclusive breastfeeding. Correct answers: *>75%; @>80%; #>50%; &66.7%.
Chi-square test.

Table 4. Proportion of correct answers according to graduation period (n=252).