

Breastfeeding Practices in Mostar, Bosnia and Herzegovina: Cross-Sectional Self-Report Study

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Aim. To investigate breastfeeding practices among mothers of infants in the city of Mostar, Bosnia and Herzegovina.

Methods. The cross-sectional self-report study was conducted among 326 mothers of infants visiting the Advisory Center for Infants at the Medical Center in Mostar and at the Children's Department of Mostar University Hospital between January and May 2003. The data were collected from mothers by trained interviewers using a structured interview. In addition to demographic data, mothers were inquired about the frequency of breastfeeding, use of commercial infant food products, and the reasons for the termination of breastfeeding.

Results. According to mothers' statements, 85%, 70%, 44%, and 8% infants were breastfed at the age of 1, 3, 6, and 12 months, respectively. Significantly more infants aged ≤ 3 months were breastfed than not. Infant formula was given to 31%, 43%, 85%, and 62% of infants aged 1, 3, 6, and 12 months, respectively. Cow milk was given to 19% of 6-month-old infants, and the proportion of infants fed with cow milk increased with age. Tea and water were often added to the infant diet. The most frequently stated reason for the termination of breastfeeding was the lack of breast milk. Decision whether to breastfeed or not was made by the mothers themselves, in 85% of cases before the delivery. Only 27% of mothers received advice on breastfeeding from the medical personnel.

Conclusion. The number of breastfed infants decreased with their age, especially after 3 months of age. Infant formulas and cow milk were introduced into infant diet very early. The reasons stated for the termination of breastfeeding reflected unawareness of the indications for ab lactation and advantages of breastfeeding. Young mothers should be better educated on breastfeeding.

Key words: *Bosnia and Herzegovina; breast feeding; infant food; knowledge, attitude, practice; milk; milk, human*

Breastfeeding is considered the optimal form of nutrition for infants, having beneficial effects on the mother, family, and even whole society (1). It is recommended that infants be breastfed until twelve months of age, ie, exclusively breastfed for the first six months and given infant food (fruit- and vegetable-based) in addition to breast milk after six months of age (1,2). Human milk, which is species-specific as every other milk, contains all the ingredients necessary for the healthy development of the child up to six months of life, except for vitamin D, which lacks in children insufficiently exposed to sunlight (3). Immunologic advantages of breast milk include protection of the infant from infections and foreign antigens introduced into the infant's body with other food (smaller chance of developing a nutritive allergy) (4-9). Some authors claim that breastfeeding also improves mental development of the child (10,11), although there are those who dispute that view (12).

Breastfeeding has positive psychological and health-related effects on the mother (1,13,14), except

for a possible bone loss (15), which seems reversible (16). In spite of the advantages of breastfeeding, infant formula products today often substitute breast milk in infant diet (17-26). In practice and literature, one of the most frequently stated reasons for the termination of breastfeeding (ab lactation) is the lack of breast milk (19,21,27). However, primary *agalactia* is very rare (13).

We performed a cross-sectional self-report study among mothers of infants in Mostar, Bosnia and Herzegovina, to establish their breastfeeding practices and proportion of supplementary diary products and cow milk in infant diet.

Participants and Methods

Participants

In Mostar, approximately 1,500 children are born every year (since 2001). For the purpose of this study, we surveyed only mothers of infants aged 0-12 months, who visited Pediatric Department of the Mostar University Hospital or the Mostar Health Center between January and May 2003 for the regular pe-

diatric checkup of their children. Out of 336 mothers who were approached, 10 declined to participate in the study, stating they could not spare the time to answer the questions, whereas 326 mothers consented to the interview. There were 148 (46%) mothers of baby girls and 178 (54%) mothers of baby boys; all infants were healthy. The median age of mothers was 29 years (range, 18-44).

For the needs of the age-related analyses, we divided mothers into 12 groups according to the age (month) of their child, trying to have at least 25 respondents in each group. The study ended when we interviewed the last mother at the end of the 5-month period of data collection.

Method

Data were collected by trained investigators using a structured interview. Participants were informed about the aim and purpose of the survey. The mothers who agreed to participate were asked questions from the questionnaire, and the answers were recorded by the investigators (a medical student and three MDs). The structured interview method was chosen to ensure that the questionnaires are properly completed and to be able to provide additional explanations, if needed (e.g., what is meant by exclusive breastfeeding or what infant food includes).

Instrument

The questionnaire was designed by the authors for the purpose of this study. There were 15 questions divided into four groups, inquiring about demographic data (mother's age, and infant's age and sex), breastfeeding practice (whether the mother breastfed at the time; if yes, how long she planned to continue breastfeeding; and her biggest concern regarding breastfeeding), sort of food other than breast milk given to the infant (water or tea; reasons to stop breastfeeding; reasons for choosing particular infant formula; and age of infant when other foods were introduced), and mother's attitude towards breastfeeding (the time she decided to breastfeed; who or what influenced the decision; how she felt about breastfeeding; discussing breastfeeding with health care professionals during pregnancy; and knowledge of advantages of breastfeeding and mother's milk).

Breastfeeding Classification

The World Health Organization (WHO) modified classification of breastfeeding was used (18) to allow for the comparison of our data with the data from other, larger surveys using the same classification (19-27). According to the WHO, breastfeeding can be either "exclusive" or "partial". "Exclusively" breastfed infants are given breast milk only and no other kinds of food, except vitamin-mineral drinks, water, or tea. "Partially" breastfed infants are given mother's milk and dairy products or solid/semi-solid food. The term "substitute milk" includes commercial infant formula dairy products and cow milk. "Supplement food" denotes food other than milk given to older infants either exclusively or along with milk (or milk products), e.g., fruit, vegetables, meat, soups, and cereals.

Statistical Analysis

Data were analyzed with chi-square test. Statistical significance was set at $p < 0.05$. SPSS Version 11.5 for Windows (SPSS Inc, Chicago, IL, USA) was used for all statistical analyses.

Results

There were 326 valid questionnaires. The data were analyzed according to the age of infants in months (12 groups). There were 26 mothers in each group of infants aged 1, 5, 6, 8, 9, 10, 11, and 12 months; 28 mothers in the group of infants aged 2 months; and 30 mothers per group of infants aged 3, 4, and 7 months.

Breastfeeding Rate

There were significantly more breastfed than non-breastfed infants in the first three months of life, with percentages ranging from 85% of breastfed infants in the first month ($p < 0.001$) to 70% in the third month ($p = 0.028$) of age (Fig. 1). From the fourth

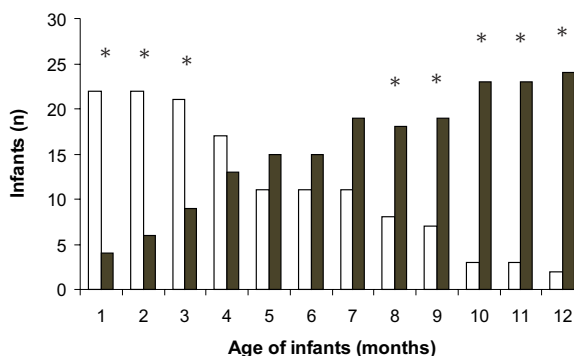


Figure 1. The rates of breastfeeding (open bars) and non-breastfeeding (closed bars) of infants in Mostar, Bosnia and Herzegovina, 2003. Asterisks indicate significant differences ($p \leq 0.028$).

month of age, the proportion of breastfed infants decreased and of non-breastfed infants slowly increased. There were significantly less infants between eight and twelve months of age who were breastfed than those who were not (Fig. 1).

Exclusive breastfeeding was practiced in 69% of infants in their first month of life, 68% in the second month, and 57% in the third month of life, whereas this rate decreased to 27% of infants in the fourth month of life. None of the infants aged 7-12 months were exclusively breastfed. In the first three months of life, the number of exclusively breastfed infants was significantly higher than the number of partially breastfed infants (Fig. 2).

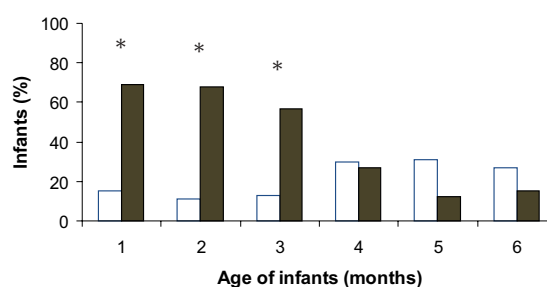


Figure 2. The rates of "partial" breastfeeding (open bars) and "exclusive" breastfeeding (closed bars) according to the age group (month of life) of infants in Mostar, Bosnia and Herzegovina, 2003. Asterisks indicate significant differences ($p \leq 0.005$).

Substitute and Supplement Food

In the first month of life, 31% ($n = 8$) of infants were given substitute milk. By the fifth month of life, their percentage had reached 88% ($n = 22$). Infants aged 10-12 months were all given substitute milk (100%; $n = 26$ in each age group) (Fig. 3).

The interviewed mothers started giving supplemental food to their children from the fifth month of life (12%; $n = 3$). In the sixth month of life, 62% ($n = 16$) infants were given supplemental food, whereas infants aged 10-12 months were all given supplemental food (Fig. 3).

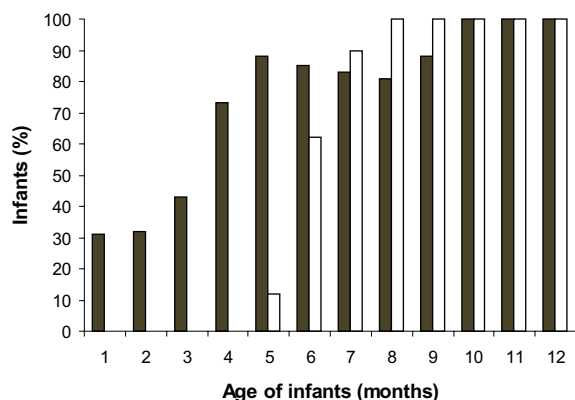


Figure 3. The rates of substitution milk (closed bars) and supplement food (open bars) in infant diet in Mostar, Bosnia and Herzegovina, 2003.

Infant formula products were the exclusive form of substitute milk given to infants up to the sixth month of life, and predominated in the infant diet until the tenth month of life (Fig. 4). Cow milk was given to infants for the first time in the sixth month of life (19%, n = 5); in the tenth month of life, 69% (n = 18) of infants were given cow milk (Fig. 4).

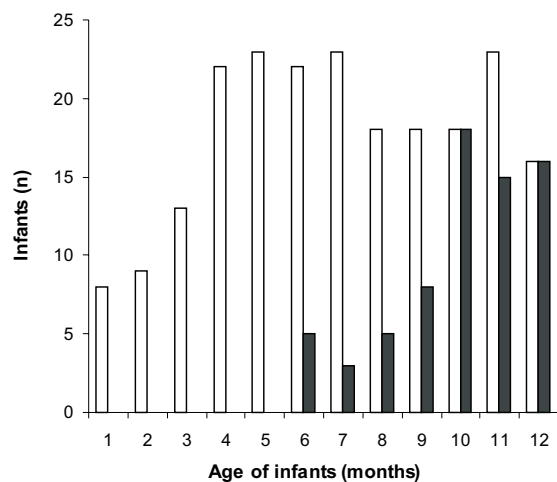


Figure 4. The rates of infant formula (open bars) and cow's milk (closed bars) in infant diet according to the infant age group (months of life) in Mostar, Bosnia and Herzegovina, 2003.

In the first and second month of life, 50% (n = 13) and 73% (n = 20) of infants were given water or tea, respectively. From the third month of life, all infants drank water, tea or both.

The most frequently stated reason for termination of breastfeeding was lack of breast milk. The second most frequent reason was maternal illness (Table 1).

Attitudes and Knowledge about Breastfeeding

The majority of mothers decided to breastfeed their child prior to the delivery (85%; n = 277). Most often, they made the decision on their own (53%;

n = 173), less frequently under the influence of media (Fig. 5). The majority of participants (92%; n = 300) believed that breastfeeding was "normal and natural". Medical staff mostly did not contribute to the knowl-

Table 1. The reasons for termination of breastfeeding among 326 mothers of infants in Mostar, Bosnia and Herzegovina, in 2003

Reasons	Mothers (%)
Lack of breast milk	68.0
Mother's illness	9.0
Infant did not want to suck	5.5
Infant's illness	3.5
"Watery milk, not nutritious"	3.5
Need to rest	3.0
Return to work	1.5
Painful nipples	1.5
Slow progression of the infant	1.5
Second pregnancy	1.0
Retracted nipples	1.0
Teething made the breastfeeding painful	0.5
Physician's advice (because of green stools, to start with supplement food)	0.5
Total	100.0

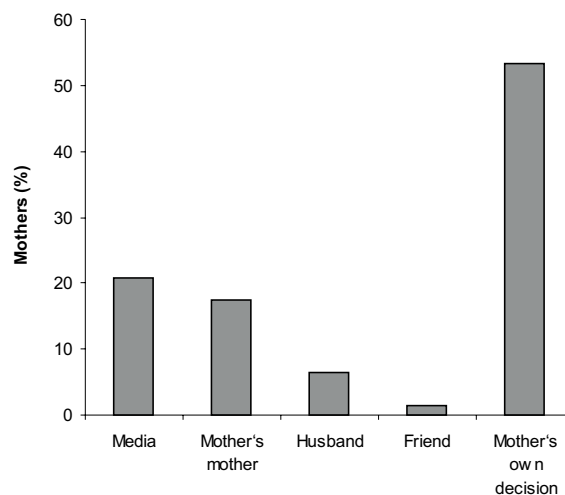


Figure 5. The main sources of influence on the mother's decision on infant diet in Mostar, Bosnia and Herzegovina, 2003.

Table 2. Advantages of breastfeeding pointed out by the mothers of infants in Mostar, Bosnia and Herzegovina, 2003

Advantages of breastfeeding	No. (%) of answers
Child is more resistant to infection	69 (19.2)
Healthier diet	49 (13.6)
Healthier child	35 (9.7)
Highest quality food	29 (8.1)
No explanation	28 (7.8)
Cheapest food	21 (5.8)
More practical	20 (5.6)
Better child development	17 (4.7)
Irreplaceable	13 (3.6)
Adjusted to the child	12 (3.3)
Higher interaction of child and mother	12 (3.3)
Less allergies	11 (3.1)
Ideal milk temperature	10 (2.8)
Protects the child from diseases	8 (2.2)
Provides all vitamins	8 (2.2)
Better for everyone	5 (1.4)
Contains no additives	4 (1.1)
Always accessible	3 (0.8)
Child has less abdominal cramps	3 (0.8)
More hygienic	2 (0.5)
Total	359 (100)*

*Asterisk indicates that some mothers gave more than one answer.

edge of mothers concerning breastfeeding. Only 27% (n = 88) of mothers received information on nutrition from the medical staff during their pregnancy, whereas 73% (n = 238) were given no advice concerning breastfeeding. Only 6% (n = 20) of mothers were not aware of the advantages of breast milk over the artificial nutrition (infant formula). Out of 306 (94%) participants who believed they knew enough about the advantages of maternal milk, 13% (n = 40) could not list any (Table 2). The most frequently stated advantage of breast milk was that "the child was more resistant to infection", followed by "breast milk was a healthier nourishment" and "the child would be healthier". Other advantages were mentioned less frequently.

Discussion

Our results showed that the number of breastfed infants in Mostar in the first three months of life was relatively high and gradually declined with infant's age. In the twelfth month of life, only 8% of infants in Mostar were still breastfed. This rate of breastfeeding in Mostar is similar to that reported for Germany (19), Italy (23), and Croatia (17), higher than the breastfeeding rate in the USA (24), and lower than in Scandinavian countries (27,28). However, the sample sizes in these studies were larger than in ours.

The rate of "exclusive" breastfeeding in our country was much lower than that recommended by the WHO (1), with no infant being "exclusively" breastfed after the seventh month of life. There were significantly more mothers that "exclusively" breastfed than those that "partially" breastfed their infants during the first three months. In Bulgaria (25) and Norway (27), the rates of "exclusive" breastfeeding were slightly higher than the rate we found in Mostar. However, in comparison with the countries of the Third World, where the rates of "exclusive" breastfeeding are very low, e.g., around 4% in the Central African Republic (18,26), the situation in Mostar is favorable. A possible explanation for such different rates of "exclusive" breastfeeding in developed European countries and African countries could be explained by the differences in life standard and education concerning the nutrition of infants, which are much better in developed part of the world. Lower breastfeeding rates in our area than in other European countries can perhaps be explained by many social disturbances that our country has been going through since the 1991-1995 war. This explanation is supported by the fact that in Croatia, the rates of breastfeeding have been higher in the areas that were not directly afflicted by the war (22).

We also found that a rather large proportion of Mostar mothers used substitute milk to feed their infants. The use of substitute milk increased with infant age – all infants older than 10 months were given substitute milk. The increased usage of substitution milk is associated with the lower rates of breastfeeding in older children. In comparison with Norway (27), the usage of substitution milk in Mostar infants is much higher. However, these results are in accordance with the higher rate of "exclusive" breastfeeding in that

country (27). The introduction of substitute milk shortens breastfeeding (20,21,29,30). High rates of usage of substitution milk reported for Croatia were explained by the war and humanitarian donations of substitution milk, together with a low socio-economic standard (17,22). The same explanations can be applied to Bosnia and Herzegovina, as it suffered a similar fate. Another reason could be aggressive marketing of infant formulas by the manufacturers that goes against the WHO/United Nations Children's Fund International Code of Marketing of Breastmilk Substitutes (29).

The early introduction of cow milk into infant diet is far from the WHO recommendations (2). In Mostar, almost one-fifth of infants aged six months and two-thirds of those aged 12 months were given cow milk. Similar rates were reported for Croatia (17). One of the possible explanations could be that mothers are unaware of the disadvantages of cow milk and potential damage it can do at infant age. The other explanation could be that cow milk is cheaper and more accessible than infant formula, and low price is an important factor in the post-war country with low-socio-economic status as is today's Bosnia and Herzegovina.

Mothers included in our study started giving supplement food to their infants in the fifth month of life, which is slightly earlier than recommended by the WHO (1). A big problem in our area is giving tea/water to infants. Half of infants are given tea or water during the first month of life, and almost all infants drink tea or water after the second month. In comparison with Germany, where only 19% of infants up to four months of life get tea or water, our situation is unfavorable (19). This could probably be explained by the lack of proper knowledge on correct nutrition of infants and by constant exchange of inaccurate and misleading information among mothers.

The reason for the termination of breastfeeding that mothers most often stated was the lack of breast milk (Table 1). Similar reasons were reported by the authors from Germany (19), New Zealand (21), and Croatia (17). Since primary agalactia is very rare, a possible explanation for this could be that mothers are not familiar with the physiology of lactation (13). Another possible explanation could be that mothers are not sure about the nutritional needs of their infants, so they make wrong assumption that their milk is not sufficient (20). Evidently, mothers should receive more education concerning the advantages of breastfeeding and see practical demonstration of breastfeeding techniques. Other reasons for the cessation of breastfeeding given by the mothers were not medically valid, also showing their lack of knowledge and information on the subject (13).

A minority of mothers said that they stopped breastfeeding due to return to work. This reason was stated more frequently by mothers in New Zealand (21), but the number of unemployed women there is probably lower than in our population.

The majority of mothers included in our study decided to breastfeed their child before the delivery and thought that breastfeeding was normal and natu-

ral. Similar findings were reported elsewhere (31). It is not clear then why the rates of breastfeeding were not in accordance with the wishes of mothers and why the number of infants being breastfed after four months of life was not higher? Were mothers reluctant to declare a socially unacceptable attitude to the interviewers ("I did not want to breast feed my child"), or did other factors or circumstances prevent them from fulfilling their plans? We found that less than one-third of mothers received some advice on breastfeeding from the health workers during the pregnancy. This could point to the responsibility of medical staff for the lower rates of breastfeeding, because one of their important duties is the medical education of patients. The fact that mothers make the decision on breastfeeding prior to the delivery may be important for obstetricians, gynecologists, and other medical staff, who could then educate women during pregnancy and stimulate them to breastfeed. Since 1998, breastfeeding has also been promoted through an initiative "Baby Friendly Hospital" in Mostar, Mostar was the first city in Bosnia and Herzegovina that established such a hospital. Yet, it seems that aggressive and perfidious promotion of infant formulas, which is not in accordance with the UNICEF rules (29), counterbalances the effects of pro-breastfeeding messages.

Our results showed that mothers were not well informed on breastfeeding. In addition, high percentage of them believed they knew enough about the advantages of breastfeeding but could not list any, or gave very vague answers. Some authors claim that there is a strong positive correlation between mothers' knowledge about breastfeeding and the actual rate of breastfeeding (30). This is in accordance with our findings. It seems that the mothers in our sample were either not aware of their lack of knowledge or were afraid to admit it to the investigators. To eliminate the possibility of embarrassment in front of the interviewer, a future survey should not be conducted in the presence of an examiner.

It is interesting to note that husbands had very little influence on women's decision to breastfeed. It seems that, in our population, it is considered mainly a mother's concern. This problem could be looked into in more detail in the future.

Although relevant, our results were obtained on a relatively small sample of mothers, with 26-30 mothers per infant age group. Future research should include a larger number of randomly selected mothers and control for the variables that may influence breastfeeding practice, such as infant health or the mother's education degree. Such a study could then be compared more reliably with similar studies conducted in other countries. Despite these shortcomings, our results emphasize the need for further promotion of breastfeeding and a better education of the population on the advantages of breastfeeding.

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