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Awareness of the diet of breastfeeding mothers. Survey and review of the latest recommendations.

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ORIGINAL ARTICLE

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Awareness of the diet of breastfeeding mothers. Survey and review of the latest recommendations

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ABSTRACT

Introduction: A breastfeeding mother using elimination diets limits the intake of certain products only for herself and not for her baby because breast milk has a relatively constant composition and largely comes from supply accumulated during pregnancy. During lactation, it is recommended to eat healthy, easily digestible and varied meals, following the principles of the food pyramid.

Aim: The article presents the current knowledge of the surveyed women about dietary recommendations during breastfeeding and current recommendations regarding this problem.

Material and methods: The study used an original questionnaire on the diet of a breastfeeding mother. Responses were collected from 630 women aged 18–44.

Results and discussion: The most questionable concern during lactation is the consumption of raw fish and raw meat. The respondents were also careful with spicy products. They had the least doubts when asked about milk, dairy produce and pickled produce. It is also worth mentioning that 10.3% of respondents consider drinking a glass of wine during lactation acceptable. The study also found health inequalities. There is a statistically significant relationship between the place of residence and the respondents' knowledge about the diet of a breastfeeding mother. Residents of large cities gave the most correct answers.

Conclusion: When educating a breastfeeding mother about the diet, special attention should be paid to the harmfulness of alcohol and debunking myths related to the fear of eating raw fish and raw meat. Women living in the largest cities are better informed on the subject. This indicates the need for education about the diet during lactation, addressed primarily to women living in rural areas and small towns.

Keywords: breastfeeding, diet, lactation, nutrition, public health

Introduction

The influence of a breastfeeding mother's diet on the composition of breast milk and the health of the infant is the subject of much research and discussion in the medical community. It is worth emphasizing right from the start that, according to the National Centre for Nutrition Education, when a breastfeeding mother uses elimination diets, she limits the intake of certain products for herself, and not for her baby, because breast milk has a relatively stable composition and largely comes from supply accumulated during pregnancy [1]. The Polish Society of Gastroenterology, Hepatology and Nutrition of Children recommends eating healthy, easily digestible and varied meals during lactation, following the principles of the nutrition pyramid [2]. Breast milk is the most appropriate first food for a newborn. It provides all the needs related to proper nutrition, but also contributes to the maturation of the immune system [3] and prevents food allergies [4]. This article presents the results of a study on the awareness of breastfeeding mothers of the diet during lactation, along with an overview of the most important data on this topic.

Aim

The study aimed to investigate awareness of the recommended diet during breastfeeding. Current recommendations on this topic were presented.

Material and methods

An original survey questionnaire was used to conduct the study, which consisted of 23 questions. The study was conducted in May and June 2024. The questions concerned products that women can consume while breastfeeding. It was completed online by 632 women aged 18–44 who had past or present experience of being pregnant and breastfeeding. The data obtained during the study was subjected to descriptive and comparative statistical analysis. Compliance with normal distribution was checked using the Shapiro–Wilk test. Non-parametric Mann–Whitney and Kruskal–Wallis tests were used to analyse the relationship between variables with a non-normal distribution. Differences between groups were analysed using Dunn’s test with Bonferonni correction. The level of statistical significance was set at 0.05. The IBM SPSS Statistic ver. program was used for the analysis. 28 companies MacBook (SPSS Inc., Chicago).

Results

The largest group of respondents were people aged 27–35 — 480 (75.9%), from rural areas — 215 (34%) with higher education — 551 (87.2%). Moreover, 616 (97.5%) women admitted that they had previously heard about the breastfeeding mother’s diet, 35 (5.5%) had used it, and 184 (29.1%) had only followed some of its recommendations. Of all the products that the respondents were asked about the possibility of consuming during the lactation period, the respondents had the most doubts about raw food. Including raw fish in the diet of a breastfeeding mother was indicated as appropriate by 426 women (67.4%), and raw meat by 405 (64.1%). Caution was also advised with regard to spicy products. When asked whether they can be included in the diet, 518 (82.0%) women said yes. On the other hand, respondents had the least doubts when asked about milk and dairy produce — 617 (97.6%) answered “yes”, and pickled products — 613 (97.0%). It is also worth noting that 65 (10.3%) women did not see anything wrong with drinking a glass of wine during the perilactation period (Table 1).

To check the relationship between the respondents’ knowledge and sociodemographic data, the number of correct answers given by each of them was summed up. There is a statistically significant relationship between the place of residence and the respondents’

knowledge about the perilactation diet. The most correct answers were given by women living in cities with over 500,000 inhabitants — 13, this result was significantly better than women from other places of residence (Table 2).

The existence of a relationship between the respondent's knowledge and their level of education was also checked — the respondents declared secondary or higher education. It turned out that the difference was significant at the level of statistical tendency ($p = 0.056$). Although in both groups the median of correct answers was 12, in the group of women with secondary education the results were more dispersed. Moreover, it was analysed whether there was a relationship between the respondents' knowledge and their age ($p = 0.152$); no statistically significant relationship was found.

The current state of knowledge

Strawberries and citrus-fruit

During lactation, it is recommended to increase the supply of vitamin C by eating vegetables and fruit [5]. This vitamin is necessary for the proper course of metabolic processes and iron absorption. Strawberries are often considered to be allergenic produce, but current research indicates that eliminating this produce from a breastfeeding mother's diet does not affect the risk of allergy development in a healthy infant. According to Kalita-Kurzyńska et al. [6] the elimination of strawberries is only justified if the mother is allergic to them. The total content of folic acid in different varieties of strawberries ranges from 30 to 69 $\mu\text{g}/100$ g of fresh weight. Oranges are also a natural source of folates, the supplementation of which is recommended for breastfeeding women at a dose of 500 μg daily. For example, orange juice contains 16–30 μg of folic acid per 100 g [7,8].

Carbonated drinks

Consumption of carbonated water by a breastfeeding mother is allowed. This is because CO_2 is removed through the intestines and excreted in the exhaled air. It is not possible for CO_2 from the mother's intestines to penetrate the mammary epithelial cells responsible for milk production [9]. According to the National Institute of Child Health and Human Development, it is recommended breastfeeding women to limit the consumption of sweetened carbonated drinks because they may contain very large amounts of sugar and caffeine, which in excess may penetrate breast milk, causing irritability and sleep problems in the infant [10].

Nuts

Nut consumption does not have to be limited due to the fear of causing a child's allergy. Only women who are allergic themselves should avoid them. Nuts are a source of fat-soluble vitamins (A, D, E and K), as well as polyunsaturated fatty acids, such as linoleic acid, linolenic acid and DHA, which are crucial for a child's development. Moreover, consuming about 15 g of nuts a day can meet the calcium needs of lactating women [11]. The Polish Society of Paediatric Gastroenterology, Hepatology and Nutrition indicates that a breastfeeding mother's energy demand increases by approximately 670 kcal per day, so nuts should not be completely eliminated due to their high-calorie content (100g of walnuts contain 654.4 kcal) [2].

Chocolate

A breastfeeding woman can eat chocolate, it is not a product intended for elimination. However, you should remember the principles of healthy eating and not eat too much sweets. Chocolate, especially dark chocolate, contains significant amounts of theobromine and caffeine, which freely passes into human milk [12]. Research findings suggest that theobromine has favourable pharmacokinetic properties, making it a potential natural supplement for bone synthesis metabolism during pregnancy, lactation, and early postnatal growth [13]. Taking into account the free transport of theobromine across the placental barrier and the immature enzymatic activity in infants, resulting in a longer half-life of methylxanthines and their accumulation, its absorption may result in noticeably stronger biological effects in the postnatal period. Therefore, special attention should be paid to limiting the consumption of theobromine, and most likely also other methylxanthines, during pregnancy and lactation [14].

Legume products

Legumes belong to the legume family, of which beans, peas, broad beans and lentils are the most commonly used in the daily diet. Legumes have a high protein content, making them an excellent substitute for meat for breastfeeding women on a vegan and vegetarian diet. There is still a myth in Poland that the diet of a breastfeeding mother, including legumes, is responsible for infant colic. The studies are divergent, but many of them do not support the thesis that infant colic is the result of an inadequate diet of the mother [15].

Spicy products

It is believed that spicy foods can cause colic, flatulence, diarrhoea and rashes in breastfed babies. However, research by Menell et al. [16] has shown that infants of mothers consuming garlic extract are fed longer and prefer a variety of flavours in breast milk, which may make the transition to solid foods easier.

Raw fish

Fish are a rich source of protein and DHA, which plays an important role in the development of the child's central nervous system. There are no recommendations to eliminate them during lactation. However, it should be noted that fish may be contaminated with heavy metals, dioxins and polychlorinated biphenyls. Too much mercury can potentially pass into breast milk and cause brain damage. You should avoid eating species such as pike, swordfish, and king mackerel, and choose species that do not accumulate mercury in large amounts: Atlantic salmon, Atlantic mackerel, hake, sprat, and catfish. The American Academy of Paediatrics notes that the neurobehavioral benefits of adequate DHA intake outweigh the potential risks associated with heavy metal contamination. Raw fish in Poland is most often served in the form of sushi. Salmon, tuna, mackerel, sea bream, butterfish, and barracuda are usually used to make it. When eating sushi, you should pay attention to what type of fish was used to prepare it [11].

Raw meat

Raw meat is the kind of food that raises a lot of controversy among breastfeeding mothers as well as medical staff. While raw meat is contraindicated during pregnancy due to the risk of infection, among others: toxoplasmosis, it does not pose a risk to the baby during breastfeeding. It should be remembered, however, that raw meat may pose a risk of food poisoning for the mother, including rare sepsis, but even in this case, there is no need to stop breastfeeding, as long as the mother is treated with appropriate antibiotics. The meat must come from a safe source, it has been tested and it is fresh, excluding poultry and game, which generally should not be eaten raw [7, 17].

Honey

Bee honey, made from flower nectar or honeydew, is one of the most valued natural products, with not only nutritional but also therapeutic properties. Its anti-inflammatory, phytochemical, antibacterial and antioxidant properties are used in medicine. Research

confirms beneficial and protective therapeutic effects in the treatment of diseases of the cardiovascular, neurological, respiratory, gastrointestinal tract and wounds. Antioxidant properties are provided by flavonoids and polyphenols, which are the main bioactive molecules of honey. Due to its health-promoting properties, a breastfeeding mother can consume honey while breastfeeding. However, it should be emphasized that consumption of honey by children under the age of 12 months is contraindicated, due to the risk of *Clostridium botulinum* infection, which causes infant botulism [18].

Dairy produce

As shown by Kramer et al. [19], a maternal elimination diet, excluding cow's milk, eggs and other antigens, may help breastfed infants with atopic eczema. However, such a diet has not been proven to prevent other allergic diseases in infants [19–21]. Restricting dairy produce in diet should be applied in justified cases, such as high suspicion of allergy to cow's milk protein. Remember that milk and dairy products are an important source of calcium, therefore, among others, The Korea Food and Drug Administration recommends breastfeeding mothers to consume 3 or more glasses of milk or dairy products every day.

Pickled produce

Fermented food products have a beneficial effect on the intestinal microflora, which is responsible for proper digestion and the production of vitamins such as B2 and K. There are no recommendations against eating pickled cucumbers or sauerkraut during pregnancy and lactation. On the contrary, they are recommended as a rich source of vitamin C and other nutrients [2]. The daily diet of a breastfeeding woman should therefore include milk, cheese and fermented drinks such as yoghurt, kefir and buttermilk. These products are full of valuable protein, fats, calcium and phosphorus [9].

Red wine

WHO and other health societies indicate that alcohol penetrating a mother's milk may negatively affect the infant's development, including its sleep, psychomotor development and cognitive abilities. Contrary to false claims, alcohol does not improve lactation, but rather lowers the level of oxytocin and inhibits the milk letdown reflex, puts the baby to sleep and thus disturbs lactation. Breastfeeding women who regularly drink alcohol expose their children to serious growth and development disorders [9].

Discussion

Myths regarding the elimination diet of breastfeeding mothers have various sources, including cultural traditions and individual cases. The issue of Polish women's awareness of the diet of breastfeeding mothers is not widely discussed in the literature. However, Bik-Multanowski et al. [22] address this issue in their study. The authors analysed questionnaires from 520 women. In terms of alcohol, 42.3% of respondents believe that a woman during lactation absolutely cannot consume it. In the present study, 89.7% of women indicate that even a glass of red wine is contraindicated in the diet of a breastfeeding mother. The results of the mentioned article do not coincide with the data collected in the present study. According to the authors of the article, more women adopt the recommended health-promoting attitude. There is no doubt that the decision to choose complete abstinence from alcohol is the best choice for breastfeeding mothers and their children [9]. Bik-Multanowski et al. [22] also asked about other products in their study. The need to eliminate peas, beans, cabbage and fried products from the diet of a breastfeeding mother is stated by 25.4% of respondents. In the present study, 89.1% of women do not see the need for such elimination, however, 7.9% of respondents believe that the amount of such products should be limited, and 3.0% indicate legumes as products prohibited during lactation. For 7.3% of women surveyed in the study by Bik-Multanowski et al. [22] a breastfeeding mother should not eat citrus fruit, strawberries, or nuts, and according to 0.4%, dairy products are not recommended. In the present study, the vast majority, as many as 94.1%, indicate strawberries as a food that does not need to be excluded from the diet. For citrus fruit it is 90.0% of respondents, for nuts, it is 91.3%. The results of both studies therefore overlap. Another study [7] analysed the opinions of Polish mothers and healthcare professionals about foods to avoid while breastfeeding. The survey was completed by 407 (35%) healthcare providers and 752 (65%) lactating mothers in non-medical professions. Raw fish and raw meat turned out to be the most controversial during lactation. Sushi was considered acceptable by 72.04% of respondents, and tartare by 68.94%. In the present study, raw fish was indicated as appropriate by 67.4%, and raw meat by 64.1%. The results of both studies are similar. Misconceptions about the need to limit these products may result from such recommendations during pregnancy. Therefore, in the future, educating patients about the differences between the diet of a pregnant woman and the diet of a breastfeeding mother should be taken into consideration. In the present study, the surveyed women indicated the need to be careful also with spicy products. When asked whether they can be included in the diet, 82.0% of women said yes. Karcz et al. [7] asked the same question and received 86.37% affirmative answers. The results of the mentioned study coincide with

the data collected in the present study. This is not the case with a Korean study that collected data from 145 breastfeeding mothers [17]. As many as 85% of the surveyed women believed that spicy foods should be eliminated from the diet of a breastfeeding mother due to possible colic symptoms or rashes in the baby. Such a difference in answers is probably due to cultural differences. In the study presented by the authors, respondents had the least doubts in the case of milk and dairy products and pickled products. They are considered safe during lactation by 97.6% and 97.0% of respondents. In the article by Karcz et al. [7] dairy products were considered acceptable by almost all women, as much as 99.14%. However, this study did not include pickled produce. Honey, chocolate and carbonated drinks were chosen by the majority of respondents in the study by Karcz et al. [7] and were deemed acceptable. For honey, it was 94.82% of affirmative answers, for chocolate 94.39% and 90.94% for carbonated drinks. The present research shows similar results. For honey 95.4%, for chocolate 92.4% and 85.1% for carbonated drinks. The result of carbonated drinks may be due to the fear that gas particles will end up in the milk. Which will cause infant colic. However, it is a myth.

Already in 1973, Blum and Lalonde created models of holistic determinants of health, which included: people's lifestyle (55%), living environment (20%), biological and hereditary factors (15%), and organization of health care (10%) [23]. The present study examined how the living environment affects women's knowledge about the diet of breastfeeding mothers. Health inequalities have been demonstrated. There is a statistically significant relationship between the place of residence and the respondents' knowledge about the diet of a breastfeeding mother. It turns out that the most correct answers were given by women living in cities with over 500,000 inhabitants, and this result was significantly better compared to women from other places of residence.

Limitations

1. The survey focused only on some products from the daily diet, chosen by the authors of the study. Thus, it does not represent all aspects of the diet of breastfeeding mothers and there is a need for further studies.
2. The survey was distributed on websites for mothers, i.e. women who are interested in the subject of a breastfeeding mother's diet. This may explain the high results achieved by the respondents.

Conclusions

1. A determinant that significantly influences women's knowledge about the diet while breastfeeding is the place of residence. Women living in the largest cities are the most informed. It indicates the need for education addressed primarily to women living in rural areas and small towns.
2. Women's greatest concerns during breastfeeding are raw and spicy products. When educating, you should focus on debunking myths related to the fear of consuming these products. Moreover, you should pay attention to informing about the fact that the diet of a breastfeeding mother is not the same as the diet during pregnancy.
3. Some women still believe that you can drink alcohol during lactation. The most appropriate attitude is abstinence and not consuming any alcohol at all during breastfeeding, therefore the issue of alcohol should not be omitted during lactation advice.

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Table 1. Respondents' knowledge about diet during breastfeeding

Can a mother consume	Women, n = 632 (%)
Citrus fruits	
• Yes	569 (90,0%)
• Yes, but only small amounts	43 (6,8%)
• No	20 (3,2%)
Carbonated drinks	
• Yes	538 (85,1%)
• Yes, but only small amounts	67 (10,6%)
• No	27 (4,3%)
Nuts	
• Yes	577 (91,3%)
• Yes, but only small amounts	45 (7,1%)
• No	10 (1,6%)
Chocolate	
• Yes	584 (92,4%)
• Yes, but only small amounts	43 (6,8%)
• No	5 (0,8%)
Legume products	
• Yes	563 (89,1%)
• Yes, but only small amounts	50 (7,9%)
• No	19 (3,0%)
Spicy foods	
• Yes	518 (82,0%)
• Yes, but only small amounts	85 (13,4%)
• No	29 (4,6%)
Raw fish	
• Yes	426 (67,4%)
• Yes, but only small amounts	36 (5,7%)
• No	170 (26,9%)
Raw meat	
• Yes	405 (64,1%)
• Yes, but only small amounts	36 (5,7%)
• No	191 (30,2%)
Strawberries	
• Yes	595 (94,1%)
• Yes, but only small amounts	29 (4,6%)
• No	8 (1,3%)
Honey	
• Yes	603 (95,4%)
• Yes, but only small amounts	22 (3,5%)
• No	7 (1,1%)
Pickled products	
• Yes	613 (97,0%)
• Yes, but only small amounts	12 (1,9%)
• No	7 (1,1%)
Milk and milk products	
• Yes	617 (97,6%)

• Yes, but only small amounts	14 (2,2%)
• No	1 (0,2%)
A glass of wine	
• Yes	65 (10,3%)
• No	567 (89,7%)

Table 2. Place of residence and respondents' knowledge about the perilactation diet

	Respondents' knowledge¹ [median (Q1;Q3)]	Test statistics (df), statistical significance	Post-hoc analysis³
Place of residence ²	1, n = 215	H = 18.468 (4), p < 0.001	1 vs. 3 — 0.612 1 vs. 4 — 0.083
	2, n = 93		1 vs. 2 — 0.057 1 vs. 5 — <0.001
	3, n = 55		3 vs. 4 — 0.497 3 vs. 2 — 0.349
	4, n = 152		3 vs. 5 — 0.013 4 vs. 2 — 0.690
	5, n = 117		4 vs. 5 — 0.015 2 vs. 5 — 0.077

¹The respondents' knowledge was assessed based on the number of correct answers they provided regarding diet in the survey questionnaire

²1 — village, 2 — city up to 50 thousand inhabitants, 3 — city 50–150 thousand inhabitants, 4 — city 150–500 thousand inhabitants, 5 — city > 500 thousand inhabitants

³The numbers describe the numbers assigned to individual places of residence, as in footnote no. 2