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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

Mothers' Knowledge and Behaviours Regarding the Use of Probiotic Supplements for Their Children: A Cross-Sectional Study

Annelerin Çocuklarına Yönelik Probiyotik Takviyesi Kullanımına İlişkin Bilgi ve Davranışları: Kesitsel Bir Çalışma

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ABSTRACT

Introduction: This study aimed to investigate mothers' knowledge and behaviours regarding the use of probiotic supplements for their children.

Materials and Methods: This cross-sectional study was conducted with 392 mothers of children aged 0-6 years who were hospitalized in the pediatric ward of an obstetrics and gynecology hospital in the Western Black Sea region of Türkiye. Data were collected by the researchers using a "Data Collection Form".

Results: Of these, 52.0% were high school graduates and had an income equal to their expenses. The study included mothers with a mean age of 32.28±3.10 years (range: 22-47). The children of the parents included in the study had a mean age of 4.55±2.20 years (range: 0-6), with 65.8% being females. 67.3% of the mothers exclusively breastfed their children for the first six months, and 70.7% introduced supplementary food in the 6th month. Additionally, 75.8% of the mothers were using probiotic supplements. Mothers primarily used probiotic supplements for their children based on doctor recommendations (32.0%), to strengthen the immune system (28.9%), and to improve digestive health (22.8%). The main reasons for using probiotic supplements were to alleviate symptoms such as diarrhoea (37.2%) and gas/bloating (31.9%). 72.2% of the mothers reported improvement in their children's health after using probiotics. The most commonly improved conditions were diarrhoea (38.1%) and gas/bloating (30.0%). Additionally, 71.7% of the mothers who were satisfied with the probiotics recommended them to their relatives. In addition to supplementary probiotics, 76.3% of the mothers also gave probiotics as food to their children. Yoghurt (34.8%) and kefir (24.8%) were the most frequently given probiotic foods. 93.4% of the mothers had information about probiotics, with the majority (52.6%) obtaining this information from their doctor.

Conclusion: Mothers demonstrated a high level of knowledge regarding supplemental probiotics. The fact that they obtained this information from a doctor indicates rational use.

Keywords: Child health, probiotic, mother, knowledge, behaviour

ÖZ

Giriş: Bu araştırmada annelerin çocuklarına yönelik probiyotik takviyesi kullanımına ilişkin bilgi ve davranışlarını incelemek amaçlandı.

Materyal ve Metodlar: Bu kesitsel araştırma Türkiye'nin Batı Karadeniz bölgesindeki bir kadın doğum ve çocuk hastalıkları hastanesinin çocuk servisinde yatan 0-6 yaş arasındaki 392 çocuğun annesi ile gerçekleştirildi. Veriler "Veri Toplama Formu" ile araştırmacılar tarafından toplandı.

Bulgular: Annelerin yaş ortalaması 32,28±3,10 (22–47), %52,0'ı lise mezunu ve %52,0'ının gelir durumu giderine eşitti. Araştırmaya dâhil edilen ebeveynlerin çocuklarının yaş ortalaması 4,55±2,20 (0–6) yıl ve %65,8'i kızdı. Annelerin %67,3'ü ilk alt ay çocuğunu sadece anne sütü ile beslemişti ve %70,7'si 6. ayda ek gıdaya başlamıştı. Annelerin %75,8'i çocuğuna takviye probiyotik kullanıyordu. Annelerin çocuğuna probiyotik takviyeleri kullanma nedenlerin çoğunlukla doktor önerdiği (%32,0), bağışıklık sistemini güçlendirdiği (%28,9) ve sindirim sistemini güçlendirdiği (%22,8) içindi. Çoğunlukla çocuğun ishal (%37,2) ve gaz/şişkinlik (%31,9) gibi şikâyetlerinin azaltılması amacıyla takviye probiyotik kullanılıyordu. Annelerin %72,2'si çocuklarında probiyotik kullanımı sonrasında iyileşme görmüştü. İyileşme görülen durumlar çoğunlukla ishal (%38,1) ve gaz/şişkinlikti (%30,0). Annelerin %71,7'si yakınlarına memnun kaldıkları probiyotikleri tavsiye etmişti. Annelerin %76,3'ü çocuğuna takviye probiyotiklerin yanında besin olan probiyotikler de veriyordu. En sık verilerin probiyotik besinler yoğurt (%34,8), kefirdi (%24,8). Annelerin %93,4'ü probiyotikler hakkında bilgi sahibiydi ve bu bilgileri en sıklıkta (%52,6) doktordan edinmişti.Sonuç: Annelerin takviye probiyotikler hakkındaki bilgi düzeyi yüksekti ve bilgiyi doktordan edinmeleri de akılcı kullanım sağladıklarını göstermektedir.

Anahtar Sözcükler: Çocuk sağlığı, probiyotik, anne, bilgi, davranış

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Introduction

The "natural" intake of certain nutrients, due to their effectiveness in the prevention and treatment of diseases, increases the importance of nutritional support in maintaining health, leading to the consumption of more functional foods and natural health products (1). Foods that have positive effects on health are called "functional foods" (2). Probiotics are important for functional foods. Probiotic comes from the Greek term "probios", "probiotic" meaning "for life" (3). When taken orally in sufficient amounts, probiotics are live microorganisms that balance the intestinal flora and positively affect the health of the host (4). Foods containing live microorganisms beneficial for the organism are probiotic-rich foods. Vinegar, boza, fermented cheeses, fermented dairy products, fermented foods are examples of such foods and are consumed worldwide (5). Commercially available probiotics are included in the category of food supplements and can be easily accessed from stores and markets without the support of health professionals and without a prescription (6). The immature immune systems and gastrointestinal structures of infants and young children raise some concerns about safe use in children (7).

The Canadian Paediatric Society states that physicians should consider the use of probiotics in the treatment of acute diarrhea in children, symptom of irritable bowel syndrome, reduction of feeding intolerance, prevention of antibiotic-associated diarrhea and atopic dermatitis (8). In a systematic review examining the effects of probiotics on child growth, it was determined that probiotic use had a positive effect on the growth of children, but studies with a high level of evidence are needed in this regard (7,9). In addition, clinical studies have shown that probiotics may help prevent or treat respiratory tract infections and acute gastroenteritis in children (10). In studies conducted in the literature with children under 2 years of age, it has been found that 50% of children have been exposed to probiotic use at some time (11–13). The number of studies recommending the use of probiotic products, which are effective in the treatment and prevention of diseases in preschool children with high growth rate and high need for protection from infections, is increasing day by day (14,15). The recent increase in the availability and popularity of probiotic products brings along some uncertainties about the effective and intelligent use of probiotic supplements by mothers in their children. In the light of all the information, this study aimed to examine the knowledge and behaviors of mothers with children aged 0-6 years regarding the use of probiotic supplements for their children.

Material and Methods

Design and participants

This study was a cross-sectional study. The population of the study consisted of mothers of children who were hospitalized for treatment and care in the pediatric ward of an obstetrics and pediatrics hospital in the Western Black Sea region of Türkiye between 24.10.2023-31.03.2024. The inclusion criteria of the mothers in the study were: (a) having a child aged 0-6 years (b) voluntarily agreeing to participate in the study. Exclusion criteria were (a) Infants in the neonatal period (b) Immunocompromised children and their mothers (c) The child has a chronic illness or any disability. On the specified dates, there were 769 mothers in the pediatric wards who met the inclusion criteria and all of these mothers were invited to participate in the study. Positive feedback was received from 392 mothers as a result of the study invitation. According to the sample calculation (margin of error 5%, confidence interval 95%), 257 mothers were sufficient for the study. The sample of the study was 392 mothers and the required sample size was reached.

Data Collection

On the dates of the study, data were collected in a quiet room from mothers with children aged 0-6 years who were hospitalized in the pediatric wards of the hospital where the study was conducted and who met the predetermined sampling criteria. They were informed by the researchers about the purpose of the study and the confidentiality of the data. Mothers who gave informed written consent were included in the study and the administration of the data collection tools took approximately 10-15 minutes.

Measurements

Data Collection Form

The data were collected with the "Data Collection Form" prepared by the researchers in line with the literature (13,16–18). The form includes 27 questions that examine the descriptive characteristics of children and mothers and the knowledge and behaviors of mothers regarding the use of probiotic products for their children. All of the mothers included in the study completed the data collection form completely.

Analysis

IBM Statistical Package for Social Sciences (SPSS) program version 22 was used to evaluate the data. Descriptive statistical methods (number, percentage, mean, standard deviation) were used. The results were evaluated at 95% confidence interval and $p<0.05$ was considered significant.

Ethics

Ethics committee approval (Protocol no: 2023-SBB-0565, Date: 21.09.2023, Decision no: 18) was obtained from the social and human sciences ethics committee of Bartin University before the start of the study. Written permission was obtained from the institution where the study was conducted. The mothers participating in the study were informed about the research. It was stated that the data would only be used within the scope of the research and confidentiality would be taken as a basis. Participation was completely voluntary.

Results

Demographic characteristics of mothers and their children

The mean age of the mothers was 32.28±3.10 years (22-47), 52.0% were high school graduates and 52.0% had income equal to expenses. The mean age of the children of the parents included in the study was 4.55±2.20 (0-6) years and 65.8% were females. In the first six months, 67.3% of the parents had exclusively breastfed their children and 70.7% had started supplementary food at 6 months (Table 1).

Behavior of mothers using supplemental probiotics

75.8% of mothers were using probiotic supplements for their children. The reasons why mothers used probiotic supplements for their children were mostly because the doctor recommended it (32.0%), to strengthen the immune system (28.9%) and to strengthen the digestive system (22.8%). Mostly, probiotic supplements were used to reduce child complaints such as diarrhea (37.2%) and gas/bloating (31.9%). 72.2% of mothers saw improvement in their children after probiotic use. Improvements were mostly diarrhea (38.1%) and gas/bloating (30.0%). 71.7% of the mothers recommended probiotics to their relatives that they were satisfied with. The majority of the reasons given by the parents who did not use probiotics were not thinking that they were unnatural (13.6%), not knowing the meaning of the word probiotic (10.9%) and that they were tasteless (10.5%) (Table 2).

Table 1. Characteristics of mothers and children (n=392)

Age	**Ort±SS=32.28±3.10**	**Min-Max =22-47**
	n	**%**
Education status		
Primary School	115	29.3
High School	204	52.0
University	51	13.0
Postgraduate	22	5.7
Income status		
Income less than expenditure	133	33.9
Income equal to expenditure	204	52.0
Income more than expenditure	55	14.0
Age of the child (years)	Ort±SS=4.55±2.20	Min-Max=0-6
Sex of the child		
Female	258	65.8
Male	134	34.2
Child nutrition in the first 6 months		
Breast milk only	264	67.3
Breast milk and formula	125	31.9
Formula only	3	0.8
Time to start supplementary food		
In the 6th month	277	70.7
Before 6th month	115	29.3

Table 2. Mothers' supplemental probiotic use behaviors (n=392)

Behavior of mothers using supplemental probiotics	**n**	**%**
Presence of probiotic supplements used for the child (such as BioGaia, enterogermina, reflor)		
Yes	297	75.8
No	95	24.2
Reasons to use probiotic supplements for your child*		
Because the doctor recommended it	229	32.0
Because it strengthens the immune system	207	28.9
Because it strengthens the digestive system	163	22.8
Due to being able to breastfeed for a sufficient period of time / breastfeeding for a short period of time	40	5.6
Even if probiotic foods are included in the child's diet, they may be inadequate	30	4.2
Because the probiotic effect of foods is thought to be small compared to supplements	18	2.5
Because probiotics are associated with many diseases	15	2.1
Child's complaint as a reason for taking probiotic supplements*		
Diarrhea	230	37.2
Gas, bloating	197	31.9
Constipation	93	15.0
Allergy	42	6.8
Urinary tract infection	29	4.7
Respiratory diseases	17	2.8
Eczema	10	1.6
Recovery after probiotic use in a child		
Yes	283	72.2
No	87	22.2
Cases of improvement after probiotic use in a child *		
Constipation	79	17.0
Diarrhea	177	38.1
Gas, bloating	139	30.0
Allergy	45	9.7
Eczema	6	1.3
Urinary tract infection	8	1.7
Respiratory diseases	10	2.2
Recommending supplemental probiotics to relatives if they are used in the child and are satisfied with them		
Yes	281	71.7
No	111	28.3
Reasons for not using probiotic supplements in children*		
Because it's tasteless	27	10.5
Because I'm still breastfeeding my child	18	7.0
I don't know the meaning of the word probiotic	28	10.9
Because it's not natural	35	13.6
Because it's expensive	22	8.6
Because I don't know the specifics.	21	8.2
Because I don't believe it's useful.	18	7.0
Since I don't think it's covered by food	21	8.2
I do not recommend it because I think it has side effects	16	6.2
I don't think it has any positive impact on health.	5	1.9
I have no idea about the effects in general	21	8.2
I think every probiotic has different side effects	8	3.1
I think any kind of external supplementation is harmful.	17	6.6

*More than one option checked.

Mothers' probiotic food use behaviors

In addition to supplementary probiotics, 76.3% of the mothers gave their children probiotics as food. The most frequently given probiotic foods were yogurt (34.8%) and kefir (24.8%). Among these foods, yogurt was the most common food given to the child every day (30.4%) (Table 3).

Mothers' knowledge about probiotics

In this study, 93.4% of the mothers had information about probiotics and received this information most frequently (52.6%) from the doctor. The knowledge questions about probiotics were mostly answered correctly (Table 4).

Discussion

The aim of this study was to examine the knowledge and behaviors of mothers regarding the use of probiotic supplements for their children. Nutrition is one of the factors that positively affect a child's well-being, development and health (19). Nutrition promotion is mostly carried out by mothers, who are the primary caregivers (20). In this study, most mothers had a high level of knowledge about supplemental probiotics, and the fact that they obtained the information from the doctor showed that they were using them rationally.

In this study, most of the mothers used probiotic supplements for their children and the reasons for using probiotic supplements for their children were mostly because the doctor recommended it. Similarly, in a qualitative study, most of the mothers stated that they were willing to take probiotic supplements upon doctor's recommendation (21). It can happen because mothers become more open to consuming certain foodstuffs when they are told to try these supplements by experts who are concerned about their child's health, such as doctors.

Probiotic supplements are used by parents to prevent signs and symptoms such as acute diarrhea, nosocomial infection, acute gastroenteritis and eczema (14). In this study, most of the mothers were using supplemental probiotics to reduce the child's digestive complaints such as diarrhea and gas/bloating. Similarly, studies have reported that mothers use probiotic supplements to improve their children's digestion (18,22,23). Therefore, it is important that parents, who play a key role in children's health, have adequate knowledge about the use of prebiotics.

Mothers' probiotic use is shaped by their efforts to protect and improve the health of their children (13). In this study, most mothers saw improvement in their children after probiotic use. The conditions that improved were mostly diarrhea and gas/bloating. Similarly, in another study, 38% of mothers reported shorter diarrhea duration after prebiotic use in their children (13). In another randomized controlled trial, it was emphasized that the intervention group using probiotics improved intestinal

Table 3. Mothers' probiotic food use behaviors (n=392)

Mothers' probiotic food use behaviors	n	%
In addition to supplemental probiotics, it is important to give the child probiotics that are food		
Yes	299	76.3
No	93	23.7
Probiotics, the food given to the child		
Goat milk	89	11.1
Boza	33	4.1
Turnip	44	5.5
Soy products	19	2.4
Vinegar	39	4.9
Parmesan	9	1.1
Yogurt	279	34.8
Kefir	199	24.8
Pickles	90	11.2
Frequency of giving your child probiotic food every day		
Goat milk	35	8.9
Boza	0	0.0
Turnip	0	0.0
Soy products	3	0.8
Vinegar	10	2.6
Parmesan	0	0.0
Yogurt	119	30.4
Kefir	33	8.4
Pickles	5	1.3

Table 4. Mothers' knowledge about probiotics (n=392)

Characteristics of mothers' knowledge about probiotics		n	%
Information about probiotic supplements			
Yes		366	93.4
No		26	6.6
Source of information on probiotic supplements			
Doctor		314	52.6
Family, friends, close environment		120	20.1
Internet		130	21.8
Pharmacist		33	5.5
Properties of probiotics	**Answers**	**n**	**%**
Probiotics work immediately after consumption.	**True**	275	70.2
	False	112	28.6
It is recommended to consume probiotics during antibiotic treatment.	**True**	322	82.1
	False	70	17.9
Probiotic use regulates digestion.	**True**	340	86.7
	False	52	13.3
Probiotic use reduces the incidence and duration of diarrhea.	**True**	336	85.7
	False	56	14.3
Probiotics only have positive benefits on the health of the digestive system.	**True**	263	67.1
	False	129	32.9
The composition of the gut microbiota is determined at birth and remains the same throughout life.	**True**	247	63.0
	False	148	37.0
Probiotic consumption strengthens the immune system.	**True**	327	83.4
	False	65	16.6
Nutrition has a significant impact on the composition of the gut microbiota.	**True**	312	79.6
	False	80	20.4
Probiotics are indigestible fibers in food that have a beneficial effect on digestion.	**True**	311	79.3
	False	81	20.7

flora and reduced respiratory tract infection after prebiotic use compared to the control group (24).

In this study, most of the mothers recommended probiotics they were satisfied with to their relatives. Similarly, in other studies, it was found that mothers heard the most information about probiotics mostly from social media and a friend (18). Health professionals need to be clear about how mothers can consume probiotics during pregnancy and during the development of their children to better understand the beneficial and protective effects of probiotics, and to determine what information is needed (25).

In this study, most mothers gave their children food probiotics as well as supplementary probiotics. The most common probiotic foods were yogurt and kefir. Yogurt may be the probiotic food that mothers most often include in their children's diets (26). Similarly, mothers can include probiotic-rich foods such as yogurt and kefir in their diet (27). This may be due to the widespread advertising of foods such as yogurt and kefir and their easy availability in the retail market (28).

Mothers usually get information about prebiotics from sources such as doctors, family members or the internet (26,27). In this study, half of the mothers received information about probiotics from a doctor. Similarly, in another study, 33% of mothers received information about probiotics from a doctor (28). A scoping review showed that contrary to the findings, mothers obtained information about probiotics from non-professional sources such as the internet or family rather than health professionals (29). More research is needed on probiotic use and information sources of mothers.

It is important for mothers to have the right information about probiotics to enable them to support their children's health by applying this information effectively (27). In this study, mothers mostly answered the knowledge questions about probiotics correctly. However, in another study, contrary to the findings of this study, it was found that mothers did not have sufficient knowledge about what probiotics are, which products contain probiotics and whether breast milk contains probiotics (18). Mothers who have heard about probiotics before may not have detailed and accurate information (26). A study has also shown that mothers are also unsure about the health benefits of probiotics and that their level of knowledge needs to be increased (11).

Our findings on probiotic use are based on parental opinions. In our study, we only used data based on parental observations when evaluating the contribution of probiotic use to recovery. Parental observation alone may not provide accurate data. In order for clinical studies to be more consistent with the findings, probiotics should be used when recommended by health professionals and parental observations should be supported by clinical results (7,9,29).

One of the strengths of this study is that it provides some important implications for future research in the related field regarding mothers' use of probiotic supplements for their children. Despite these strengths, the study had some limitations. First, since the study was conducted in a certain society and culture, there may be a deficiency in questioning the use of probiotic food. Future studies may examine the knowledge and behaviors of mothers in different societies and cultures regarding the use of probiotic supplements. Secondly, we did not investigate the probiotic use of the mothers themselves before and during pregnancy. It is thought that the use of probiotic supplements by the mothers themselves may also affect the use of probiotic supplements for their children. Third, since this study was conducted in an obstetrics and gynecology hospital in western Türkiye in terms of external validity, the results of this study cannot be generalized. Fourth, we did not ask a question about the age at which mothers first gave probiotics to their children. This variable could be included in future studies. Fifth, whether the children were taking other medications during their illness was not examined. This important point is a limitation of the study and this variable should be addressed more comprehensively in future studies.

Conclusion

The mothers had good knowledge about supplemental probiotics and the fact that they obtained the information from the doctor shows that they provided rational use. According to the opinions of the mothers, supplemental probiotics and foods with probiotic properties were effective in reducing children's complaints such as diarrhea and gas/bloating. Breast milk is a natural biological fluid rich in prebiotics and probiotics, and these components support the optimal development of the infant's gut microbiota. In healthy infants who are exclusively breastfed, the lack of need for additional probiotics is related to this biological richness (16). Therefore, it is important to provide breast milk promotion by healthcare professionals in the first six months of life, especially for breastfed infants.

Ethical Considerations: Ethics committee approval (Protocol no: 2023-SBB-0565, Date: 21.09.2023, Decision no: 18) was obtained from the social and human sciences ethics committee of Bartin University before the start of the study.

Peer-review: Externally peer-reviewed.

Consent of Patients: The participants were informed in detail, and informed consent was obtained.

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