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# Mothers' Knowledge, Attitudes, and Practices Regarding Probiotics, Their Components, and Uses in Preschool Children

## Okul Öncesi Çocuklarda Annelerin Probiyotikler, İçerikleri ve Kullanım Alanları Hakkındaki Bilgi, Tutum ve Davranışları

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## Abstract

**Objective:** This study aimed to evaluate the knowledge, attitudes, and practices of mothers with at least one preschool-aged child regarding probiotics, their components, and their uses.

**Method:** Between January 2020 and April 2020, a 22-item questionnaire was administered to mothers of preschool-aged children. The survey assessed socio-demographic characteristics, awareness of probiotics, use of probiotics for their children, factors influencing their use, and mothers' knowledge, attitudes, and perceptions regarding probiotics.

**Results:** A total of 136 mothers participated in the study [age range: 23-52 years, mean ± standard deviaton (SD): 33.38±5.5 years]. The participants' children were aged between 3 months and 5 years (mean ± SD: 2.73±1.52 years). Among the mothers, 116 (85.3%) reported awareness of the term probiotic, and 69 (50.7%) reported using probiotics for their children. The most commonly used strain was ***Bacillus clausii.*** Of those who had heard of probiotics, 66 (56.8%) had learned about them through TV, newspapers, magazines, or the internet, while 36 (31.0%) had heard about them from healthcare professionals. A total of 87 mothers (75%) stated that they would not use probiotics without consulting a doctor. Additionally, 72 mothers (62.1%) considered probiotics as dietary supplements. Among the participants, 58.1% believed probiotics help prevent diseases, and 52.9% knew they contain a high concentration of live microorganisms. Higher education and income levels, employment, and having a professional occupation were significantly associated with greater awareness and use of probiotics for their children.

## Öz

**Amaç:** Okul öncesi dönemde en az bir çocuğu olan annelerin probiyotikler, içerikleri ve kullanım alanları hakkında bilgi düzeyi, tutum ve davranışlarının incelenmesi amaçlanmıştır.

**Yöntem:** Ocak 2020-Nisan 2020 tarihleri arasında okul öncesi dönemde çocuğu olan annelerin sosyo-demografik özellikleri, probiyotik farkındalığı, çocukları için probiyotik kullanım durumları, kullanımı etkileyen faktörler, probiyotikler hakkında bilgi düzeyleri, davranış ve düşüncelerini belirlemeye yönelik 22 sorudan oluşan anket formu uygulandı.

**Bulgular:** Çalışmaya 136 anne katıldı [min: 23, maks: 52, ortalama ± standart sapma (SS): 33,38±5,5]. Katılımcıların çocukları minimum 3 ay, maksimum 5 yaşında idi (ortalama ± SS: 2,73±1,52). Katılımcıların 116'sı (%85,3) probiyotikler hakkında farkındalığa sahipti. Altmış dokuz kişinin (%50,7) daha önce çocuğu için probiyotik kullandığı saptandı. En çok kullanılan suş *Bacillus clausii* idi. Daha önce probiyotik terimini duyanların 66'sı (%56,8) TV-gazete-dergi-internetten, 36'sı (%31,0) sağlık çalışanından duymuştu. Doktora danışmadan probiyotik kullanmayacak 87 kişi (%75) idi. Yetmiş iki kişi (%62,1) probiyotiklerin besin takviyesi olduğunu düşünüyordu. Katılımcıların %58,1'i probiyotiklerin hastalıkları önlemeye yardımcı olduğunu, %52,9'u yüksek oranda canlı mikroorganizma içerdiğini biliyordu. Annelerin eğitim ve gelir düzeylerinin yüksek olması, çalışıyor ve meslek sahibi olmaları, probiyotik farkındalığının artması ve çocukları için probiyotik kullanımının daha yaygın olmasıyla ilişkili bulundu.

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## Abstract

**Conclusion:** Awareness of probiotics among mothers is high. Higher levels of education, income, employment, and professional status are associated with greater awareness and usage of probiotics. While TV, newspapers, magazines, and the internet are the most common sources of information about probiotics, physician recommendations strongly influence decisions to use them.

**Keywords:** Dietary supplements, preschool children, probiotics

## Öz

**Sonuç:** Annelerin probiyotik farkındalığı yüksektir. Yüksek eğitim ve gelir düzeyi, çalışma durumu ve meslek sahibi olmak probiyotik farkındalığını ve kullanma oranlarını artırmaktadır. Annelerin probiyotikleri en çok duydukları kaynaklar TV-gazete-dergi-internet iken probiyotik kullanma kararında doktor tavsiyesi güçlü bir etkendir.

**Anahtar kelimeler:** Gıda takviyesi, okul öncesi çocuk, probiyotikler

## Introduction

Probiotics (PBs) are non-pathogenic live microorganisms, many of which are part of the normal human gut flora, and they provide health benefits to the host when consumed in adequate amounts (1). First defined in 1960 as "bacterial species believed to be beneficial to the digestive system", PBs were later characterized by the World Health Organization in 2001 as "live microorganisms that, when administered in adequate amounts as part of food, confer a health benefit on the host". For a microorganism to be considered a probiotic, it must originate from human sources, be resistant to secretions from organs such as the stomach and bile, maintain viability in the gastrointestinal system (GIS), stimulate an immune response, produce antimicrobial substances, and be non-pathogenic (2).

PBs are commonly used for various GIS-related conditions, including acute gastroenteritis, antibiotic-associated diarrhea, constipation, and necrotizing enterocolitis. However, studies have also suggested potential benefits in non-GIS areas, such as allergic diseases, cardiovascular health, immune system support, and urogenital health (3).

Over the past decade, publications on probiotic indications in the pediatric population have highlighted the global significance of this topic. Nevertheless, more comprehensive studies are needed to establish definitive evidence (4,5). An additional factor influencing probiotic use in children is parental attitudes, with mothers playing a particularly critical role due to their primary responsibilities in childcare.

This study aims to assess the knowledge, attitudes, and behaviors of mothers with at least one preschool-aged child regarding PBs.

## Materials and Methods

### Data Gathering Tool and Process

The study was conducted between January 1, 2020, and April 1, 2020, among patients who visited the Family Medicine outpatient clinics of University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital and agreed to participate. A 22-item questionnaire, prepared based on a literature review, was administered to mothers of preschool-aged children. The questionnaire aimed to assess participants' socio-demographic characteristics, awareness of PBs, probiotic use for their children, factors influencing their use, and knowledge, attitudes, and perceptions regarding PBs.

Participants who reported previous probiotic use for their child were asked to specify the name of the most recent commercial product or probiotic food they had used. Foods such as kefir and yogurt were categorized as natural probiotics, while the probiotic strains contained in commercial forms were recorded for those who used such products.

The study included mothers who had at least one child older than three months and five years of age or younger, completed the questionnaire in full, and agreed to participate. Mothers who did not meet these criteria, provided incomplete or erroneous responses, or declined to participate were excluded. A total of 208 questionnaires were collected; after eliminating incomplete or incorrect forms, 136 questionnaires were included in the final analysis.

A post-hoc power analysis was conducted for the chi-square test, assuming a medium effect size (Cohen's w=0.3). With a sample size of 136 and a significance level of 0.05, the achieved power was 93.8%, indicating that the study had a strong ability to detect significant associations.

The reliability and validity of the 10 items assessing mothers' knowledge and attitudes toward PBs were also evaluated. Internal consistency was examined using Cronbach's alpha, which was calculated as 0.96, indicating excellent reliability. Exploratory factor analysis was performed, and according to the Kaiser criterion, a single factor with an eigenvalue of 9.48 was identified, while all other factors had eigenvalues

below 1. This result supports the unidimensional structure of the scale. The questionnaire was developed based on a review of the literature and expert input; however, no formal pilot study was conducted prior to data collection, which we acknowledge as a methodological limitation.

### Statistical Analysis

Statistical analysis was performed using SPSS 25.0 for Windows. Descriptive statistics were presented as frequencies and percentages for categorical variables, and as means, standard deviations (SDs), minimums, and maximums for numerical variables. Comparisons of proportions in independent groups were conducted using the chi-square test. Fisher's exact test was used when the chi-square test was not applicable. A statistical significance level of $p<0.05$ was considered significant.

### Ethics

This descriptive study was approved by the Clinical Research Ethics Committee of University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital with the approval number 2503, dated September 3, 2019. All participants provided informed consent.

## Results

A total of 136 mothers participated in the study. Among the participants, 84 (61.8%) were under 35 years of age, while 52 (38.2%) were 35 years or older (mean ± SD: 33.38±5.5 years; range: 23-52 years). A total of 31 participants (22.8%) had an education level below high school, and 41 (30.1%) reported having no income or an income below the minimum wage. Seventy-five participants (55.1%) were actively employed, while 50 (36.8%) were homemakers, and 24 (17.6%) were self-employed or working in the private sector. Regarding the age of their children, 61 participants (44.9%) had a child aged 2 years or younger, whereas 75 (55.1%) had a child older than 3 years (range: 3 months-5 years).

When asked about their awareness of the term "probiotic", 116 mothers (85.3%) stated that they were aware of it at least once. Among these 116 participants, 66 (56.8%) had learned about PBs through TV, newspapers, magazines, or the internet, while 36 (31.0%) had learned about them from healthcare professionals. Sixty-nine participants (50.7%) had previously used PBs for their child. Regarding their perception of probiotics, 72 participants (62.1%) believed that PBs were dietary supplements, whereas 17 (12.5%) considered them beneficial microorganisms for gut health. Eleven participants (9.5%) stated that they did not know what PBs were, while 8 participants (6.9%) believed they were medications. Furthermore, 87 mothers (75.0%) stated that they would consult a doctor before using probiotics.

The perceptions of participants with Pb awareness regarding specific foods classified as PBs are shown in Figure 1. Yogurt (n=112, 96.5%) and kefir (n=100, 86.2%) were most commonly recognized as probiotic foods.

The most frequently consumed probiotic foods at home were homemade yogurt (n=76, 55.9%) and while the least consumed were boza (a fermented beverage, n=98, 72.1%) and turnip juice (n=74, 54.4%).

Participants' responses to knowledge statements about PBs are presented in Table 1. Among these, 58.1% believed

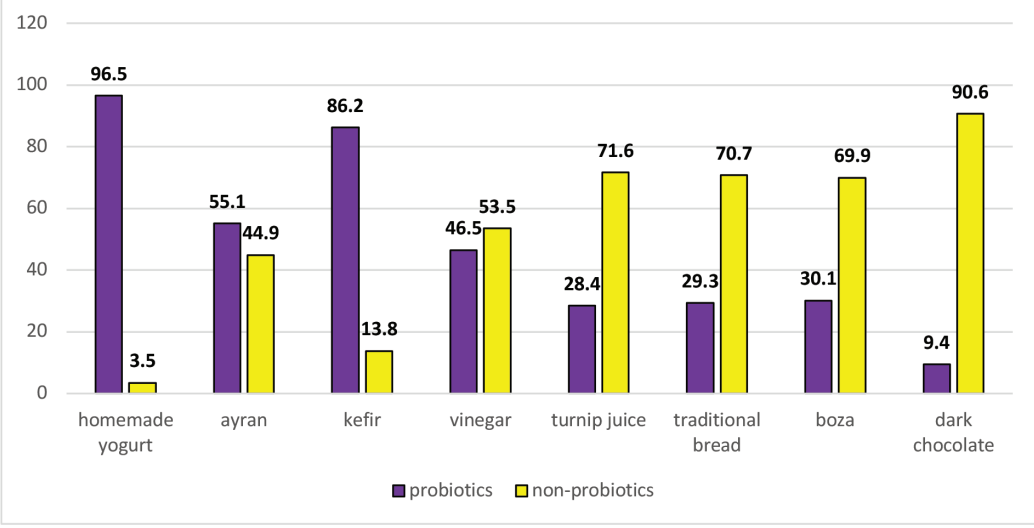


**Figure 1.** Participants' opinions on whether certain foods are probiotics, among those with probiotic awareness (%)

PBs help prevent diseases, 52.9% knew PBs contain a high concentration of live microorganisms, 50% thought PBs have therapeutic effects for certain diseases, 47.1% believed PBs do not increase cancer risk, and 43.4% stated that PBs prevent diarrhea.

Of the 69 participants who had used PBs at least once, 28 (40.6%) reported using them occasionally when their child was sick, and 34 (49.3%) had used PBs for a duration between 10 days and 6 months. A total of 41 participants (59.4%) used PBs upon a doctor's recommendation, while 14 (20.3%) were influenced by their social circle or family, and 9 (13.0%) followed the advice of a pharmacist. Among those who had used probiotics, 58 participants (84.1%) reported benefiting from probiotic foods and supplements, and 62 (89.9%) stated that they would recommend PBs to others.

Among the 69 participants who provided information about the PBs they used, *Bacillus clausii* (n=20, 14.7%) was the most commonly reported strain, followed by natural probiotic sources such as kefir and yogurt (n=12, 8.8%) (Table 2).

The relationships between participants' age groups, their children's age groups, educational levels, income levels, employment status, and awareness or use of PBs for their children are presented in Table 3. Participants with high school education or above, those earning at least the minimum wage, and those with professional occupations were significantly more likely to report probiotic awareness (p=0.000 for all). Similarly, these groups had higher rates of using PBs for their children (p=0.000, p=0.004, and p=0.000, respectively).

## Discussion

Although various studies in the Turkish literature have examined knowledge, attitudes, and practices regarding PBs in different population groups, research specifically addressing mothers' knowledge, usage patterns, and influencing factors remains limited. This study, therefore, holds importance in addressing this gap (6,7).

In studies conducted in Turkey, the percentage of participants who responded "yes" to knowing what PBs are has ranged from 20.2% to 73.3% (6,8-12). In a study by Zemzemoğlu et al. (8), 55.6% of participants reported knowing what PBs are. When asked about their level of knowledge, 68.6% described it as moderate, while 25.4% described it as low (8). In this study, 85.3% of participants reported probiotic awareness. Variability in reported knowledge levels in the literature may stem from differences in the socio-demographic characteristics of the study populations.

A study by Yücel Şengün et al. (9) found that postgraduate degree holders were the group with the highest knowledge of PBs (66.7%). Similarly, Pehlivan and NURT (13) observed a general increase in probiotic knowledge with higher educational levels. Another study found that mothers with higher education and income levels, as well as those who were employed, were more likely to know what PBs are compared to mothers with lower education and income levels or those who were unemployed (6). In the study by Gültekin Ulusan et al. (7), participants with higher education levels and incomes exceeding their expenses had significantly greater knowledge of PBs. Consistent with the literature, higher education levels, income levels, and employment status were significantly associated with greater awareness of PBs in the present study.

**Table 1. Participants' responses to statements about probiotics n (%)**

| Statement | No knowledge/ never heard | Disagree | Neutral | Agree | Total |
|---|---|---|---|---|---|
| Probiotics have therapeutic effects for some diseases | 31 (22.8) | 13 (9.6) | 24 (17.6) | 68 (50.0) | 136 (100) |
| Probiotics contain a high number of live microorganisms | 30 (22.1) | 15 (11.0) | 19 (14.0) | 72 (52.9) | 136 (100) |
| Microorganisms in probiotics are always alive | 31 (22.8) | 27 (19.9) | 52 (38.2) | 26 (19.1) | 136 (100) |
| Probiotics help prevent diseases | 29 (21.3) | 11 (8.1) | 17 (12.5) | 79 (58.1) | 136 (100) |
| Probiotics increase the risk of cancer | 35 (25.7) | 64 (47.1) | 28 (20.6) | 9 (6.6) | 136 (100) |
| Probiotics stimulate appetite | 32 (23.5) | 31 (22.8) | 50 (36.8) | 23 (16.9) | 136 (100) |
| Probiotics prevent diarrhea | 31 (22.8) | 17 (12.5) | 29 (21.3) | 59 (43.4) | 136 (100) |
| Probiotics contribute to eye health | 34 (25.0) | 19 (14.0) | 62 (45.6) | 21 (15.4) | 136 (100) |
| Probiotics contribute to skin health | 35 (25.7) | 17 (12.5) | 36 (26.5) | 48 (35.3) | 136 (100) |
| Probiotics help with weight loss | 33 (24.3) | 24 (17.6) | 37 (27.2) | 42 (30.9) | 136 (100) |

A study among healthcare professionals identified the most common reasons for not consuming PBs as the lack of perceived need (60.8%), not knowing what probi PBs otics are (41.7%), and not considering them natural (41.7%) (14). Another study found that among those not consuming probiotics, 54.7% were unaware of what PBs are, 24.7% did not feel the need, and 10.4% did not consider them natural (15). In another study, reasons for not using PBs included high cost (36.4%), lack of need (30.3%), not considering them natural (27.3%), and lack of knowledge about PBs (6.1%) (11). In this study, the most frequently reported reasons for not using PBs included a lack of perceived need (32.8%), lack of probiotic awareness (29.8%), and not considering them natural (7.4%).

In a study where students were asked about the benefits of probiotics, 84.3% reported experiencing benefits, and 82.4% stated they would recommend PBs to others (8). Another study reported that approximately 90% of women who used PBs during pregnancy and postpartum for their babies perceived benefits from their use (6). Similarly, 84.6% of postmenopausal women expressed satisfaction with probiotic-containing foods (11). In alignment with these findings, 84.1% of participants in the present study who had used PBs reported experiencing benefits, and 89.9% stated they would recommend them to others.

A study by Köse et al. (14) found that participants most commonly learned about PBs from the internet, followed by advertisements, newspapers, and magazines. Another study reported that 41.6% of participants had learned about PBs through advertisements, 35.6% through the internet, 32.7% from their social circle or family, and 31.7% from experts (16). In yet another study, the sources influencing probiotic consumption were TV, newspapers, and magazines (13.7%), the internet (12.8%), and social circles (6.2%) (17). In this study, the most frequently reported sources of awareness included TV, newspapers, magazines, and the internet (56.9%). However, only 2.9% of participants reported using PBs based on recommendations from these sources. The strongest influence on probiotic use was found to be doctor recommendations (59.4%). Consistent with this, 75.0% of participants stated that they would consult a doctor before using probiotics.

In this study, 44.8% of participants indicated that PBs could help address digestive system problems, while 13.8% believed they could be beneficial for immune system support. Similarly, a study found that 81.8% of women believed PBs benefit digestive problems, and the remainder thought they were helpful for immune system issues (11).

**Table 2. Characteristics of participants who used probiotics at least once (n=69)**

| Characteristic | n (%) |
|---|---|
| **Recommendation source** | |
| TV, newspapers, magazines, internet | 2 (2.9) |
| Social circle and family | 14 (20.3) |
| Doctor | 41 (59.4) |
| Pharmacist | 9 (13.0) |
| Does not remember | 3 (4.3) |
| **Duration of probiotic use** | |
| Occasionally when ill | 12 (17.4) |
| 10 days or less | 16 (23.2) |
| 10 days-6 months | 23 (33.3) |
| 6 months or more | 11 (15.9) |
| Does not remember | 7 (10.1) |
| **Perceived benefit from probiotics** | |
| Benefited | 58 (84.1) |
| Did not benefit | 8 (11.6) |
| Neutral | 3 (4.3) |
| **Recommendation to others** | |
| Would recommend | 62 (89.9) |
| Would not recommend | 4 (5.8) |
| Neutral | 3 (4.3) |
| **Classification of probiotics used** | |
| *Bifidobacterium animalis* | 8 (11.6) |
| Mixed microorganisms | 4 (5.8) |
| *Saccharomyces boulardii* | 3 (4.3) |
| Yogurt/kefir | 12 (17.4) |
| *Bacillus clausii* | 20 (29.0) |
| Does not remember | 11 (15.9) |
| *Lactobacillus reuteri* | 9 (13.0) |
| *Lactobacillus rhamnosus* | 2 (2.9) |

Another study reported that approximately 80% of men and women believed PBs benefited the digestive system, while about 20% thought they supported the immune system (13). A study among students found that 67.9% consumed PBs for digestive issues, 17.9% for immune system support, and 17.9% for circulatory system problems (18). PBs are predominantly associated with gastrointestinal health benefits, particularly due to their frequent recommendation in the management of diarrhea-related conditions. Literature suggests that approximately 80% of the immune cells in humans are located in gut-associated lymphoid tissue. When gut health is compromised, immune system function can also deteriorate. PBs may support the immune system by enhancing the production and activation of immune cells, influencing the gut-brain axis, and competing with harmful microorganisms in the gut.

**Table 3. Relationship between socio-demographic characteristics and participants' awareness of the term "probiotic" and probiotic use for their children n (%)**

| Characteristic | Awareness of probiotic term | | | Probiotic use for their children | | |
|---|---|---|---|---|---|---|
| | Heard | Not heard | p | Used | Not used | p |
| **Mother's age** | | | | | | |
| Under 35 years | 73 (86.9) | 11 (13.1) | 0.500 | 44 (52.4) | 40 (47.6) | 0.626 |
| 35 years and older | 43 (82.7) | 9 (17.3) | | 25 (48.1) | 27 (51.9) | |
| **Child's age** | | | | | | |
| Under 3 years | 53 (86.9) | 8 (13.1) | 0.637 | 29 (47.5) | 32 (52.5) | 0.502 |
| 3 years and older | 63 (84.0) | 12 (16.0) | | 40 (53.3) | 35 (46.7) | |
| **Education level** | | | | | | |
| Below high school | 14 (45.2) | 17 (54.8) | **0.000*** | 6 (19.4) | 25 (80.6) | **0.000** |
| High school and above | 102 (97.1) | 3 (2.9) | | 63 (60.0) | 42 (40.0) | |
| **Income level** | | | | | | |
| Below minimum wage | 27 (65.9) | 14 (34.1) | **0.000** | 13 (31.7) | 28 (68.3) | **0.004** |
| Minimum wage and above | 89 (93.7) | 6 (6.3) | | 56 (58.9) | 39 (41.1) | |
| **Employment status** | | | | | | |
| Unemployed | 44 (72.1) | 17 (27.9) | **0.000** | 23 (37.7) | 38 (62.3) | **0.006** |
| Employed | 72 (96.0) | 3 (4.0) | | 46 (61.3) | 29 (38.7) | |
| **Occupation** | | | | | | |
| Homemaker | 33 (66.0) | 17 (34.0) | **0.000** | 13 (26.0) | 37 (74.0) | **0.000** |
| Civil servant/private sector/self-employed | 83 (96.5) | 3 (3.5) | | 56 (65.1) | 30 (34.9) | |

*: Fisher's exact test

Regular consumption of probiotic-rich foods can positively impact gut microbiota and contribute to immune system activation (19).

To achieve the expected benefits of probiotic products, they must be consumed regularly and consistently, and the number of live microorganism cells ingested must exceed a certain threshold (9).

Naturally occurring PBs can be found in foods such as yogurt, kefir, pickles, certain types of cheese, traditional bread, and boza. They are also available as dietary supplements in tablet, capsule, or powder forms. A study found that although mothers lacked sufficient knowledge about PBs and which products contained them, they consumed natural probiotic foods daily (6). In the present study, when participants were asked about the PBs they used for their children, only 17.2% mentioned yogurt or kefir, while the remainder cited commercial products. This may indicate a lack of awareness regarding probiotic-containing foods, as some participants incorrectly classified certain foods as probiotics.

In the study, the probiotic foods most frequently consumed daily or more than once a week were yogurt (55.9%; 33.8%), and ayran (35.3%; 51.5%). In a study conducted with postmenopausal women, 50% of participants consumed yogurt every other day, 16.7% consumed it daily, 25% consumed kefir every other day, and 65% consumed kefir daily (11). Another study found that 51.4% of participants consumed yogurt daily, while 7.5% consumed kefir once a week, with yogurt being the most recognized probiotic food (12). While the frequency of probiotic food consumption in the present study was relatively high, knowledge regarding probiotic foods remained limited.

The most commonly recognized benefits of PBs were their ability to help prevent certain diseases (58.1%), treat certain diseases (50.0%), and contain high amounts of microorganisms (52.9%). Fifty-nine participants (43.4%) believed that PBs prevent diarrhea. In one study, 84% of participants thought PBs help fight infections, 80% believed they treat diarrhea, and 80% recognized their high microorganism content (20). Another study found that 56.3% of men and 43.9% of women believed PBs contain high amounts of microorganisms, while approximately 56% of all participants believed PBs strengthen the immune system (13).

In this study, *B. clausii* was identified as the most frequently used strain. According to the World Gastroenterology Organization's global guidelines on prebiotics and probiotics, there is no specific recommendation for the use of *B. clausii* in pediatric populations (1). However, recent evidence suggests that *B. clausii* may have potential benefits in the prevention and treatment of diarrhea in both pediatric and adult populations (21,22). This may explain why *B. clausii* was the most commonly used strain in this study.

### Study Limitations

In this study, as the data were collected through self-reported questionnaires, there is a risk of bias, including social desirability and recall bias. Additionally, the study was conducted in a single region and included mothers who voluntarily participated, which may limit the generalizability of the findings to other populations.

Another limitation is that the questionnaire was not subjected to a formal pilot test to ensure comprehensibility before data collection. Furthermore, although internal consistency and factor analysis demonstrated excellent reliability (Cronbach's alpha =0.96) and a coherent unidimensional construct (eigenvalue of the first factor =9.48), no formal content validity index was calculated. These methodological shortcomings should be considered when interpreting the results.

## Conclusion

The study demonstrates that while most mothers reported awareness of probiotics, only a portion were aware of their potential benefits. Higher education and income levels, employment status, and having a professional occupation were associated with greater awareness and use of PBs for their children. The most common sources of information about PBs were TV, newspapers, magazines, and the internet, while doctor recommendations were identified as having a strong influence on mothers' decisions to use probiotics.

To enhance the positive public health impact of probiotics, we recommend increasing educational broadcasts and articles in visual and written media. Additionally, healthcare providers should offer informative guidance to mothers about probiotics, their benefits, and their applications, as this could positively influence mothers' knowledge, attitudes, and behaviors regarding probiotics.

### Ethics

**Ethics Committee Approval:** This descriptive study was approved by the Clinical Research Ethics Committee of University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital with the approval number 2503, dated September 3, 2019.

**Informed Consent:** All participants provided informed consent.

### Footnotes

### Authorship Contributions

Concept: G.Z.Ö., Design: G.Z.Ö., O.P.Ö., Data Collection or Processing: Y.G.A., G.Z.Ö., O.P.Ö., Analysis or Interpretation: Y.G.A., G.Z.Ö., Literature Search: Y.G.A., O.P.Ö., Writing: Y.G.A., G.Z.Ö.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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## References

1. World Gastroenterology Organisation Global Guidelines Probiotics and Prebiotics. [cited 2024 Jan 2]. Available from: https://www.worldgastroenterology.org/UserFiles/file/guidelines/probiotics-and-prebiotics-english-2023.pdf.
2. Gökırmaklı Ç, Seydim Z. Effects of probiotics on colon microbiota: recent studies. J Biotechnol and Strategic Health Res. 2020;4(3):212-224.
3. Bridgman SL, Azad MB, Field CJ, Letourneau N, Johnston DW, Kaplan BJ, et al. Maternal perspectives on the use of probiotics in infants: a cross-sectional survey. BMC Complement Altern Med. 2014;14:366.
4. Martinelli M, Banderali G, Bobbio M, Civardi E, Chiara A, D'Elios S, et al. Probiotics' efficacy in paediatric diseases: which is the evidence? A critical review on behalf of the Italian Society of Pediatrics. Ital J Pediatr. 2020;46(1):104. Erratum in: Ital J Pediatr. 2020;46(1):116.
5. Schneider R, Sant'Anna A. Using probiotics in paediatric populations. Paediatr Child Health. 2022;27(8):482-502. English, French, French.
6. Cevik Guner U, Kissal A. Mothers' knowledge, attitudes and practices regarding probiotic use during pregnancy and for their infants in Turkey. Public Health Nutr. 2021;24(13):4297-4304.
7. Gültekin Ulusan A, Başpınar MM, Basat O, Ulusan C, Geylani Güleç S. Probiotic product use and awareness in mothers of 0-5 age group children. Journal of Izmir Faculty of Medicine. 2023;2(2):98-104.
8. Zemzemoğlu TEA, Uludağ E, Uzun S. Determination of university students' knowledge and consumption of probiotics. GIDA. 2019;44(1):118-130.
9. Yücel Şengün İ, Kırmızıgül A, Özaydın İ, Yarım H. Determining consumers' knowledge and consumption of probiotic and prebiotic foods: the example of Izmir/Bornova. GIDSA. 2020;45(1):103-114.

10. Yurttaş M, YIlmaz A. Knowledge and consumption of probiotic products among health college students. GUSBD 2017;6(2):64-69.

11. Küçük SC, Yıbar A. Knowledge and consumption of probiotics among postmenopausal women. J Res Vet Med. 2021;40(2):125-130.

12. Zeren R. Determination of knowledge and consumption level of probiotic nutrient on adult individuals. Thesis, Haliç University / Institute of Health Sciences / Department of Nutrition and Dietetics, Istanbul: 2015.

13. Pehlivan B, NUTRT. Evaluation of frequency of adults' probiotic food consumption and levels of knowledge. BARNAT. 2021;15(1):1-4.

14. Köse B, Aydın A, Özdemir M, Yeşil E. Determination of the knowlege level and consumption of probiotic, prebiotic and sinbioticals on healthcare prosfesional. Academic Gastroenterology Journal. 2019;18(2):67-72.

15. Aydın M, Açıkgöz İ, Şimşek B. Knowledge and consumption of probiotics among students at Isparta Suleyman Demirel University. Food Technology Electronic Journal. 2010;5(2):343-354.

16. Nagata S, Chiba Y, Wang C, Yamashiro Y. The effects of the Lactobacillus casei strain on obesity in children: a pilot study. Benef Microbes. 2017;8(4):535-543.

17. Derin DÖ, Keskin S. Determination of probiotic product consumption among food engineering students: the case of Ege University. GIDA. 2013;38(4):215-222.

18. Güleç M. Knowledge and consumption of probiotic products among secondary school teachers: the case of Ceyhan District. [cited 2023 Dec 23]. Available from:https://avesis.gazi.edu.tr

19. Yapıcıoğlu Yıldızdaş H. Probiotics and the immune system in children. Klinik Tıp Pediatri. 2016;8(3):5-10.

20. Özgül AA, Bozat C, Seziş M, Badur Y, Özcan ÖÖ, Sarıyer ET, et al. Knowledge and consumption of probiotic foods among individuals in the workforce. IGUSABDER. 2020;(12):365-378.

21. Sudha MR, Jayanthi N, Pandey DC, Verma AK. Bacillus clausii UBBC-07 reduces severity of diarrhoea in children under 5 years of age: a double blind placebo controlled study. Benef Microbes. 2019;10(2):149-154.

22. Acosta-Rodríguez-Bueno CP, Abreu Y Abreu AT, Guarner F, Guno MJV, Pehlivanoğlu E, Perez M. Bacillus clausii for gastrointestinal disorders: a narrative literature review. Adv Ther. 2022;39(11):4854-4874.