



Assessment of Knowledge and Consumption Level of Probiotics Dairy Products among the Students and Staff of Mashhad University of Medical Sciences

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ARTICLE INFO	ABSTRACT
Article type: Research Paper	Introduction: An increasing interest concerning probiotics has emerged among the public, researchers, governmental organizations (such as the WHO/FAO), and medicinal and food companies. Little is known about probiotic consumption, despite its increasing availability. Therefore, this study aimed to assess the knowledge of the educated level of Mashhad University of Medical Sciences, Mashhad, Iran towards the benefits of probiotics.
Article History: Received: 13 Apr 2020 Accepted: 04 Aug 2020 Published: 16 Aug 2020	Methods: This cross-sectional survey was conducted among 400 academic staff and students at Mashhad University of medical sciences through a designed checklist. The checklist includes demographic characteristic questions (age, sex, marital status, and education level) as well as questions evaluating the knowledge of individuals about the probiotics. Statistical analyses were done by SPSS, Software, Ver. 16.0.
Keywords: Knowledge Probiotic Dairy products Consumption level	Results: The total number of the current study respondents was 400 with the mean age of 36.3 ± 12.8 and a majority of them were males (53.4%, n: 212), married (54.8%), and had an academic position (46.2%). Probiotic knowledge was significantly linked with marital status and those who were at the position of assistant professor ($p < 0.05$). There was a significant association between the consumption of probiotic dairy products and education level ($p < 0.05$), as the highest percentages of participants who consumed dairy products were assistants and associated professors (89.2% and 89.1%, respectively).
	Conclusion: In this study, although the majority of the participants were aware of the presence of beneficial microorganisms in probiotics dairy products, they did not consume adequate amounts of dairy products and dairy-based probiotics. According to the information obtained from this study, there is a need for further education and promotion of the students in regards to the definition, oral benefits, and sources of probiotics.

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Introduction

Probiotics are living microorganisms with beneficial health effects which can control pathogenic microbes and are mostly found in the gut membrane. The first concept of the term probiotics was probably suggested by Mechnikov in 1907 (1, 2). Food and Agriculture Organization (FAO), World Health Organization (WHO), and International Scientific Association for Probiotics and Prebiotics (ISAPP) have defined probiotics as live organisms that, confer a health benefit on the host when administered in adequate amounts (3). The most common probiotic microorganisms found in food are the two main genera of bacteria:

Bifidobacterium (*B. adolescentis*, *B. animalis*, *B. bifidum*, *B. breve* and *B. longum*) and *Lactobacillus* (*L. acidophilus*, *L. casei*, *L. fermentum*, *L. gasseri*, *L. johnsonii*, *L. paracasei*, *L. plantarum*, *L. rhamnosus* and *L. salivarius*) (4, 5). Different studies have shown the effectiveness of these probiotics in prevention and control of several diseases; they improve the gut microbiota balance to defenses against pathogens and they also, reduce the risk of gastrointestinal (GI) infections, lactose intolerance, different types of diarrhea (acute infectious, and traveler's diarrhea) and some dental problems. Moreover, probiotics have beneficial effects on type2 diabetes mellitus,

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allergy, liver diseases, hypercholesterolemia, and cancer (6-9). Probiotics are widely used in food production, based on their affirmative qualities (10). Probiotic products are divided into three general groups: Dairy products, especially probiotic yogurt; Non-dairy food products such as probiotic confectionery; and nutritional supplements in the form of tablets, powders, and capsules (11, 12). Various probiotic products including probiotic drinks, milk, cheese, buttermilk, and sour cream are currently produced and marketed worldwide. (13). Despite their beneficial effects on human health and the availability of probiotic products. Unfortunately, many probiotic products have not been properly identified, so they are not consumed so often because consumers lack knowledge about probiotic products and their benefits(14). In a study conducted in Canada, 62% of respondents were unfamiliar with the term probiotic dairy products. Also, 92% of respondents did not know the difference between regular and probiotic yogurt (15). In a study conducted by Kayisoglu et al. (2015), 38.5% of the respondents did not consume probiotic products and 11.2 % of them believed that these products were harmful (11). Despite the availability of different types of probiotic products and their beneficial effects on health, consumption of probiotic products is low, which may be due to the lack of consumers knowledge on the benefits of probiotic products(16). Given that full awareness and understanding of these products and their properties can increase the demand for consumption and improve community health, the aim of this study was to determine the awareness and consumption level of probiotic dairy products among faculty members and students of Faculty of Medicine, Mashhad University of Medical Sciences, Iran.

Materials and Methods

A cross-sectional study was conducted among students and academic staff of Mashhad University of medical sciences, Mashhad, Iran. The

questions were modeled based on previously published studies on the knowledge of probiotics (17, 18). In this study, the checklist consisted of 4 sections; the first section covers demographic information including age, sex, education level, and residence. The second part of the checklist included the amount of probiotic dairy products consumption among students and staff. The third part consisted of the knowledge of individuals relative to the probiotic products and the last section included the source of information and knowledge on probiotic products (book, TV, radio, friends, product label, and internet). Since no other study has been conducted in this regard, based on the assumptions ($\alpha = 0.05$, $d = 0.05$, $Z_{1-\alpha/2} = 1.96$, $p = 0.5$) and taking into account the 5% sample loss, 400 individuals were selected for this study. A total of 400 participants consisting of 212 (53.4%) men and 185 (46.6%) women were randomly selected from staff and students. The data were analyzed by SPSS Version 16 software. Quantitative data were described as mean and standard deviation and qualitative data as frequency percentages. To analyze the differences among more than two groups, if the variable was qualitative, the chi-square test was used; and if it was quantitative, ANOVA statistical test was applied. Statistical significance was set at a P value < 0.05 .

Results

Demographic information

In this study, demographic information of the participants is shown in table 1. Of the total of 400 participants, 46.6% were female and 53.4 % were male with the mean age of 36.3 ± 12.8 ranging from 20 to 72 years of age. As expected, the mean age and the marital status of the faculty members were significantly higher than the students ($P < 0.001$). In terms of education level, the percentage of those with postgraduate education and those with an assistant professor degree was higher than other participants (22.8 % and 21.5% respectively).

Table 1. Demographic characteristic of staff and students (n= 400)

Characteristic		N	Mean \pm SD (%)	P-value
Gender	Male	212	53.4	P = 0.001
	Female	185	46.6	
Age	Professors	181	46.6 \pm 10.8	P <0.001
	Students	213	27.4 \pm 7.1	
Marital status	Married	400	53.42	P <0.001
	Single		46.33	
	Widow		0.25	

Characteristic		N	Mean \pm SD (%)	P-value
Type of residence	Private home	218	54.8	P < 0.001
	Dormitories	116	29.2	
	with family	62	15.6	
Education Level	Master		22.78
	PhD		11.14	
	General physician	400	20.00	
	Assistant professor		21.52	
	Associated professor		11.90	
	Professor		12.66	

Descriptive-Analytical Statistics of Dairy Products and Probiotics Consumption Questionnaire

As can be seen in table 2, over 82.4% of all people who participated in the study consumed dairy products. Moreover, 44% of them stated that they only consume one dairy unit per day. Regarding the amount of dairy consumption, based on the education level, the consumption level was higher among faculty members with an assistant professor and associated professor degrees compared to other scientific groups (89.2% and 89.1%, respectively). As a result, there was a

significant difference between people with different education levels and the number of dairy products they consumed ($P = 0.02$). There was also a significant difference between people with educational backgrounds and the daily consumption of dairy products ($P < 0.001$). Most of the dairy products consumed in this study population were yogurt and milk (37.2% and 29.4%, respectively). It was discovered that there was no significant difference between the type of dairy product and the level of education ($P < 0.12$). Table 2 also shows that only 47.7% of the target population consumed acceptable level of probiotic (mostly and sometimes)

Table 2: The probiotics dairy products consumption by students and staff of Mashhad University of Medical Sciences

Questions	Answers
Do you consume dairy?	
Yes	318(82.4%)
No	11(2.8%)
In small quantities	57(14.8%)
How many units of dairy do you consume daily?	
1unit*	174(44.8%)
2unit	124(32.0%)
3unit	58(14.9%)
4unit	11(2.8%)
No use	21(5.4%)
What is your most used type of dairy?	
Milk	106(29.4%)
Yogurt	134(37.2%)
Cheese	47(13.1%)
Cream	6(1.8%)
Dough	18(5.0%)
Do you consume probiotic dairy products?	
Mostly**	21(5.5%)
Some times	157(42.2%)
Rarely	120(32.1%)
Never	76(20.3%)

*Each unit is equal to one glass of milk, 3/4 glass of yogurt and 30 grams of cheese

** Mostly: 6-7 days a week; Sometimes: 4-5 days a week; Rarely: once a week or less

Descriptive-analytic statistics of the knowledge regarding dairy and probiotics

The results of the knowledge of participants on probiotic products are presented in Table 3.

The participants' knowledge of probiotic products was evaluated and 179(46.0%) of the participants stated that they knew probiotic products. It was also discovered that there was no significant association between education level or marital

status and the awareness towards probiotic products. The knowledge of participants about the benefits of probiotic microorganisms was evaluated and 81.5 % of them answered positively. It was also discovered that there was no significant association between the education level and the knowledge of the properties of microorganisms in probiotic products (P = 0.24). In the present study, 102(27.5%) of the

participants declared that they had benefited from the therapeutic properties of probiotic dairy products. Based on education level, the most common use of probiotic therapies belonged to those with a master's degree. About 68.9% of the participants would like to recommend probiotic dairy products to others including children and pregnant women.

Table 3: Knowledge of probiotic dairy products among students and staff of Mashhad University of Medical Sciences

Questions	Answers		
	Yes (%)	No (%)	Do not know (%)
Have you ever had benefited from the therapeutic properties of probiotic products?			
Master	29(35.4)	53(64.6)	
PhD	9(21.4)	33(78.6)	
General physician	20(27.4)	53(72.6)	
Assistant professor	22(27.8)	57(72.2)	
Associated professor	16(34.8)	30(65.2)	
Professor	6(13.0)	40(87.0)	
Do probiotic dairy products have beneficial microorganisms?			
Master	70(79.5)	0(0.0)	18(20.5)
PhD	41(95.3)	0(0.0)	2(4.7)
General physician	62(78.5)	3(3.8)	14(17.7)
Assistant professor	63(78.8)	2(2.6)	15(18.8)
Associated professor	38(84.4)	0(0.0)	7(15.6)
Professor	38(79.2)	0(0.0)	10(20.8)
Do probiotic dairy products have healing properties?			
Master	63(71.7)	4(4.3)	21(23.3)
PhD	35(83.3)	3(7.1)	4(9.5)
General physician	52(65.8)	3(3.8)	24(30.4)
Assistant professor	61(76.4)	7(8.6)	12(15.0)
Associated professor	34(73.9)	2(4.6)	10(21.6)
Professor	33(68.8)	3(6.3)	12(25.0)

Sources of Information on probiotic dairy products

Participants in this study had acquired their information regarding probiotics from various sources (Figure 1) including books (19.76%),

pamphlet (3.23%), internet (28.23%), television (2.82%), radio (0.40%), teacher (14.92%), friend (14.11%) and product information on the labels (16.53%).

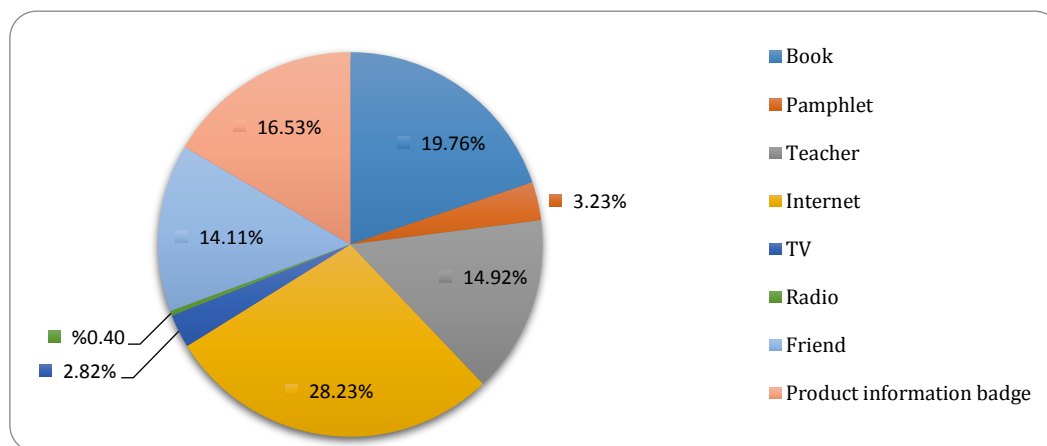


Figure 1: Sources of information on probiotics of the participants

Discussion

Here, we have presented a cross-sectional study of the level of knowledge of the educated level of Mashhad University of Medical Sciences, Mashhad, Iran, towards the benefits of probiotics dairy products. If probiotics, as microorganisms are used in adequate amounts and the active form, confer a health benefit on their host. Probiotic foods have beneficial effects on the health of the gastrointestinal tract (2, 3) by modulating the gut microbial flora. There is now good evidence on the therapeutic effects of probiotics in infectious diarrhea, diarrhea caused by antibiotic therapy or lactose intolerance, inflammatory bowel disease, irritable bowel syndrome, constipation, and *Helicobacter pylori* infection (17-19). The results of the present research showed that 46.0% of the participants stated that they knew probiotic products. In Fijan et al (2019) study, most of the respondents had an acceptable level of knowledge (medium 36.4% or good 36.2%) (20). Amarauche et al. also stated that 72.4% of people in their study were aware of the benefits of probiotic products while in an earlier study by Bogue et al. (2005), it was reported that the Irish consumers were unaware about the benefits of probiotics. A similar study by Soni et al. (2018) also reported that among the students of different fields, approximately 93% of the participants were aware of the term probiotics (21). Since the target population of our study was among the highest educated classes of the society, their awareness in this regard should be increased. Knowledge of probiotic products played a significant role in the awareness and consumption of probiotic foods (7). As stated by the participants, the internet was the main source of their information (28.23%) which reveals the insignificant role of the media and university education. Besides, one study in Turkey showed that the source of information on probiotic products was television, books, and the internet (11). It should be noted that over 82.4% of all people in this study consumed dairy products. Moreover, 44% of them declared that they consumed only one dairy unit per day. The recommended daily amounts of dairy products are 3 units, which show that the majority of the studied population consumed insufficient amounts. This finding should be taken into account since milk and dairy products play a major role in providing protein and calcium (22). Erdem et al (2018), determined that 56.3% of the

participants consumed probiotic products and 35.9% of them mentioned that they consume probiotic food once a day (21). In another similar study, it was found that 42.2% of the participants consumed probiotic products because they do believe that they are healthy and help digestion (11). In a study conducted by Amarauche et al. (2016), 65.6% of the participants believed that probiotics contained live microorganisms (23). Also, a common reason for not using probiotic products was the lack of knowledge regarding these products in 47.3% of the population. The amount of probiotic consumption was acceptable in 47.7% of the faculty members and students which was lower than a similar study, in which the vast majority of health professionals (86.8%) consumed probiotics (20).

Conclusion

In this study which was conducted at Mashhad University of Medical Sciences, Mashhad, Iran, most of the participants were aware of the presence of beneficial microorganisms in probiotics dairy products. Participants stated that they had so far benefited from the therapeutic properties of probiotic dairy and would like to recommend probiotic dairy products to others including children and pregnant women. In this study, most participants did not consume a sufficient quantity of dairy products and dairy-based probiotics. According to the information obtained from this study, there is a need for further education and promotion of the students in regards to the definition, oral benefits and sources of probiotics specially the popular sources (yogurt and milk). Also, given the high impact of social media on nutritional awareness and practices, it is important to emphasize the ongoing nutritional educations.

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