

Determination of probiotic concept product consumption among people of ages 14-65

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Summary. *Aim:* This study was planned in order to determine the level of knowledge and consumption of probiotic products featured on their status in adults aged 15-69 living in Samsun. *Methods:* A total of between 15-69 years, with 761 volunteers, applying the survey data was collected. All data were analyzed using the SPSS 13.0 package program recorded on the computer. *Results:* Consumption of the probiotic product is 59.5%. They are also on the recommendation of 8.2%, 14.6% due to digestive problems, she loves the taste of 34.9%, to protect the health of 35.1%, and 7.2% reported that they consume for other reasons. No consume the probiotic product is 40.5%. They are not like the taste of 25.6%, 32.8% find it expensive, there is not knowledge about probiotics of 41.6%. 250 participants who have health problems, in terms of distribution according to age in the use of probiotic products, showed an increase with age ($p = 0.024$). Gender, age and education level had no effect on the consumption of probiotic products ($p > 0.05$). There is a statistically significant relationship between the level of income or health problem and probiotic products consumption ($p = 0.023$; $p = 0.015$). *Conclusion:* 59.5% of the participants probiotics product is consume. Probiotic product consumption make a difference not statistically significant by level of education but it is considered a bit of a younger generation through education. Health problems of participants use probiotic products showed an increase with age.

Key words: probiotic products, education, age, consumption

Introduction

The use of probiotic and prebiotic has markedly increased in recent years. Probiotics are live microorganisms which, when administered in adequate amounts, may confer a health benefit on the host (1-3). Such probiotic foods may modulate gut microbial composition, thereby leading to improved gut health (4). Selected as probiotic bacteria during food processing and storage during their viability proof, able to reproduce should be pathogen must produce toxic metabolites, must be genetically stable (5). Many studies have focused on using Gram positive lactobacilli and bifidobacteria as probiotics, also part of the intestinal microflora, whilst other studies have included Gram negative *Escherichia coli* (6-8).

Some of the benefits of consuming bifidobacteria include their ability to synthesize vitamins including folate (9). In the elderly, the abundance of bifidobacteria decreases markedly (10). Research in an elderly cohort (>65 years old) has revealed that administration of bifidobacterium species resulted in an increase in the abundance of this organism in stool samples as well as increased stool frequency and reduced inflammatory status (11). They have been widely reported to alleviate lactose intolerance, suppress diarrhea, reduce irritable bowel symptoms and prevent inflammatory bowel disease. GI cancers are considered to be multifactorial diseases, the ultimate result of complicated relationships between genetics, epigenetics, immunity, environment, diet and lifestyle, all of which could interact with the GI

microflora, altering its profiles and functions during the tumour genesis and growth (7, 12).

Since microbiota is involved in the genesis of GI cancers, its beneficial manipulation may have cancer-preventive/therapeutic effects (7). It has been proposed that probiotics protect the host not only from intestinal diseases, but also from allergic disorders, liver inflammation, and other systemic conditions (13, 14). Probiotics or their metabolites interact with the host and with microbes, as beneficial commensal intestinal microbes do. As immune modulators, they have been used in inflammatory skin conditions, such as atopic dermatitis. Probiotics and prebiotics appear to be effective in reducing the incidence of atopic dermatitis in infants; however, their role in atopic dermatitis treatment is controversial. Although their role in acne, wound healing, and photoprotection is promising, larger trials are needed before a final recommendation can be made (3).

Despite the accessibility of variety of probiotic products (15) and also the availability of large number of data supporting the importance of probiotics in health in the past decade (16-19), their consumption is still low and may be due to the lack of knowledge of consumers and health-related professionals as providers of health information to people. There is not enough data on the consumption of these products.

The present study was carried out with participants aged between 15 and 69 years and living in Province Samsun. The study was designed and conducted to determine the level of knowledge of individuals on probiotic products and reasons for their consumption as well as to identify the correlation of consumption with the level of education and family income.

Material and method

This study was conducted at a medical center in Samsun between January and April, 2014.

Population and Sample: The present study included 761 patients aged between 15-69 who lived in Samsun, presented to the medical center within the specified dates, and accepted to participate. All participants were able to communicate, had no hearing and/or visual impairment. No specific mistake was identi-

fied in their data collection forms. Random sampling method was used for selecting the subset of the population. Prior to the beginning of the study, the participants were informed of the objective and duration of the study, and they gave verbal consents for the study.

Data Collection Tools: Research data was obtained by the questionnaires filled out through face-to-face survey method. Prepared in line with the literature, the questionnaire covers anthropometric measurements and demographic characteristics and question whether participants consume specific probiotics (kefir, yoghurt, dairy products, etc.) as well as the amount of probiotic product consumption and the reasons for probiotic product consumption.

Data Analysis: The Statistical Package for the Social Sciences (SPSS) Windows 13.0 was used for statistical data analysis. Besides the charts showing the mean, standard deviation (SD) and percentage (%) values, the Chi-square (X^2) significance test was used for statistical evaluation of the results obtained from the survey. $p < 0.05$ was considered significant in all tests.

Results

This study was designed and carried out to identify the probiotic product consumption status of the individuals aged between 15 and 69. The average age, height and weight of the participants were 30.4 ± 12.1 years, 168.5 ± 9.2 cm and 68.9 ± 14.6 kg, respectively. While 57.8% of participants ($n=440$) were female, 42.2% ($n=321$) were male, and 40.2% of all participants were married. Table 1 shows the general characteristics of the participants.

When the participants were analyzed regarding the educational background, 9.5% were primary school graduates, 32.5% were high school graduates, 52.4% were college graduates and 5.7% were post graduates or had a higher education level. 47.2% of the participants did not have any income while the income of 8.5% ranged between 183.4-366.8 \$. The income of 16.6% ranged between 367.2-733.6 \$, and that of 27.7% was higher than 733.9 \$. When BMI was considered, 6.3% of the patients were underweight, 56.6% was normal, 27.5% was overweight, 7.3% had first degree obesity and 2.2% had second degree obesity (Table 1).

Table 1. Demographic characteristics of participants (n=761)

Status		n	%
Age (years)	15-20	172	22.6
	21-30	287	37.7
	31-40	141	18.5
	41-50	96	12.6
	51+	65	8.5
Gender	Female	440	57.8
	Male	321	42.2
Marital status	Married	306	40.2
	Single	455	59.8
Education	Primary school	72	9.5
	High school	247	32.5
	College graduates	399	52.4
	Higher E. or post graduates	43	5.7
Income	No	359	47.2
	183.4-366.8 \$	65	8.5
	367.2-733.6 \$	126	16.6
	733.9 \$ and over	211	27.7
BMI(kg/m ²)	<18.5 (underweight)	48	6.3
	18.5-24.9 (normal)	431	56.6
	25.0-29.9 (overweight)	209	27.5
	30.0-34.9 (obesity 1)	56	7.4
	35.0-39.9 (obesity 2)	17	2.2

59.5% of 761 participants stated that they consume probiotic products. Advices by other users, digestive problems, taste and health protection were the reasons specified respectively by 8.2%, 14.6%, 34.9% and 35.1% of those participants. Additionally, 7.2% had other reasons for consuming probiotic products. However, 40.5% of the participants reported that they did not consume probiotic products because they do not like the taste (25.6%) or they found them expensive (32.8) or did not have information on probiotics (41.6%).

The consumption of probiotic products showed an increase by age among 250 participants who had health problems ($p=0.024$); however, no statistically significant difference was detected in participants that did not have any health problems ($p=0.754$) (Table 2).

Gender, age, and educational background did not affect consumption of probiotic products ($p>0.05$). However, there was statistically significant correlation between the level of income, health problems on the one hand and the consumption of probiotic foods on the other hand ($p=0.023$ and $p=0.015$, respectively). The higher the level of income was, the lower the consumption of probiotic products. 163 (65.2%) of 250 participants who had health problems consumed probiotic products. Nevertheless, 290 of 511 (56.8%) healthy participants did not eat and/or drink probiotic products.

Table 2. Consumption of probiotic products status according to the health problems and state in the age group.

Health problems	Ages groups	Consumption of probiotic product				p
		Yes		No		
		n	%	n	%	
Yes	15-20	28	65,1	15	34,9	$X^2=11.244$ $p=0.024$
	21-30	50	71,4	20	28,6	
	31-40	40	67,8	19	32,2	
	41-50	29	72,5	11	7,5	
	51+	16	42,1	22	57,9	
No	15-20	75	58,1	54	41,9	$X^2=1.903$ $p=0.754$
	21-30	124	57,1	93	42,9	
	31-40	46	56,1	36	43,9	
	41-50	33	58,9	23	41,1	
	51+	12	44,4	15	55,6	

Table 3. Status of individual consumption of probiotics products according to the ages, gender, income and education (n=761).

Status		Consumption of Probiotics Products					
		Yes		No		Total	
	n	%	n	%	n	%	
Income (\$)	No	230	64.1	129	35.9	359	100
	183.4-366.8 \$	41	63.1	24	36.9	65	100
	367.2-733.6 \$	74	58.7	52	41.3	126	100
	733.9 \$ and over	108	51.2	103	48.8	211	100
		X ² : 9.539		p=0.023			
Ages groups (years)	15-20	103	59.9	69	40.1	172	100
	21-30	174	60.6	113	39.4	287	100
	31-40	86	61.0	55	39.0	141	100
	41-50	62	64.6	34	35.4	96	100
	51+	28	43.1	37	56.9	65	100
		X ² : 8.599		p=0.072			
Gender	Female	272	61.8	168	38.2	440	100
	Male	181	56.4	140	43.6	321	100
		X ² : 2.273		p=0.076			
Health problems	Yes	163	65.2	87	34.8	250	100
	No	290	56.8	221	43.2	511	100
		X ² :4.973		p=0.015			
Educational status	Primary school	47	65.3	25	34.7	72	100
	High school	146	59.1	101	40.9	247	100
	College graduates	238	59.6	161	40.4	399	100
	Higher E. or post graduate	22	51.2	21	48.8	43	100
		X ² : 2.257		p=0.521			

When the reasons for probiotic product consumption were analyzed with respect to age groups, the digestive problems getting severe by older age were found to affect consumption ($p=0.006$). Even though probiotic products were favored by young people due to their taste, their preferability decreased with age because of the same reason ($p=0.007$). Nevertheless, other reasons (the products being healthy, advised by users, and etc.) of probiotic product consumption were detected not to be affected by age.

Discussion

Consumption of probiotics is useful for immune system stimulation and regulation, prevention and treatment of infections, treatment of inflammatory bowel diseases and prevention of attacks, prevention of lactose intolerance, lowering blood cholesterol, reduction of cancer development, delaying the onset of allergic reactions in children, and treatment and prevention of vaginal and urinary tract infections in women (20).

Especially consumption of yoghurt, kefir and other probiotic dairy products in recent years is known

Table 4. Reasons for consumption of probiotic products according to age group

Causes of consumption		15-20 age		21-30 age		31-40 age		41-50 age		51+ age		X2/p
		n	%	n	%	n	%	n	%	n	%	
Digestive problems	Yes	7	4,1	23	8	19	13,5	14	14,6	3	4,6	14.449
	No	165	95,9	264	92	122	86,5	82	85,4	62	95,4	0.006
Found flavor	Yes	50	29,1	56	19,5	24	17	22	22,9	6	9,2	14.212
	No	122	70,9	231	80,5	117	83	74	77,1	59	90,8	0.007
Protecting health	Yes	57	33,1	97	33,8	53	37,6	36	37,5	16	24,6	3.944
	No	115	66,9	190	66,2	88	62,4	60	62,5	49	75,4	0.414
Advised by users	Yes	10	5,8	14	4,9	4	2,8	4	4,2	5	7,7	2.813
	No	162	94,2	273	95,1	137	97,2	92	95,8	60	92,3	0.590

to have increased rapidly in many countries. Approximately three out of every five people consume probiotic products in this study. Reasons for consumption are health protection, their taste, digestive problems, recommendation and other reasons, respectively. In a study conducted only on students, consumption of probiotic products was reported to be 38.4% (21). It is a well known fact that health problems increase with age. When the reasons for consumption of probiotic products are examined based on age groups, digestive problems increasing with age were reflected in consumption; however, although young people like the taste of probiotic products more, their preference decreases with age. Finding them healthy, recommendation and other reasons for consumption showed no change with age. A study conducted on students reported that 79.5% liked consuming probiotic products (21). Another study found that only 8.3% of students used probiotic products (22).

Gender and educational background did not have any impact on the consumption of probiotic products. In a study conducted on university students, 29.2% of male students and 42.5% of female students were found to consume probiotic products (23). Aydın et al. found the probiotic product consumption to be 21.5% among male students and 27.3% among female students in their study (24, 25). The results of our study were similar with the literature in that women consume more probiotic products compared than men. It is known that women give more importance to health, nutrition and

body image compared than men. It may have resulted in increased consumption of probiotics and probiotic products as well as advanced knowledge on the products by women. In this study, the consumption of probiotics reduced with the increase of income level. Income level is known to be closely related to human health. High consumption ratio of probiotics among low-income individuals may be due to the fact that people with lower income have more health problems and try to find alternative treatments for these problems. Principally, as high income level ensures advanced education level and better awareness, it was expected that the consumption of probiotics to increase in the high-income group. The most interesting result of this study was that the new generation adopted the consumption of probiotic products. Another interesting result of this study was that 41.6% of the participants were not familiar with probiotic products. Among some earlier studies carried out on university patients, the rate of participants who had knowledge of probiotics was reported 49.2% in Derin and Keskin, 43.5% in Yabancı and İmrek, and 54.7% in Aydın (21, 23, 24). Payahoo L et al. reported that 6% of medical science students had poor, 43% acceptable, and 51% good knowledge (26). Venter and Hanekom showed that the knowledge about probiotics was low among consumers in South Africa (27). In Robertson's study (28), only 14% of the South African adults had information about probiotics while Bogue and Sorenson reported that the Irish consumers were unaware about probiotics (29).

Low level of knowledge on probiotics is not limited to consumers, because Anukam et al. (30) indicated that 95.2% of Nigerian clinicians were not familiar with probiotics. In Edmund's survey (31) only 31% of clinicians in Canada had knowledge on probiotics. Bogue's study (25) reported that 70% of consumers were not familiar with the term 'probiotic'. The results of the studies in this field vary notably from one another. It is considered that as people are unfamiliar with probiotics and the society is not sufficiently informed on probiotics, the consumption of the products remains limited.

The reasons participants stated for consuming probiotics were as follows: protecting health, loving the taste, having digestive problems, on advice and other reasons. On the other hand, being unknowledgeable of probiotics, finding the products expensive and not loving the taste were the reasons argued for not consuming probiotic products. In an earlier study, students listed the factors that affect their probiotic consumption as follows: advertisements (31.6%), health problems (27.9%), advice (22.1%) and education (18.4%) given at school on the products. 305 student did not consume probiotic products, and listed their reasons as not having information on the products (49.2%), finding them unnecessary (38.7%), considering them unnatural (5.9%), finding them expensive (4.3%) and tasteless (1.9%) (21).

Yabancı and imşek reported that the most significant reasons of the students for not consuming probiotics were being unknowledgeable of probiotics (43.5%), considering the products unnatural (19.5%), not needing them (14.9%), and finding the products overpriced (12.9%) or flavorless (8.5%) (23). In a similar study, the participants who did not consume probiotics stated that they did not eat and/or drink probiotic products as they did not know the products (54.7%); they did not need them (24.8%); they considered them unnatural (10.4%) or found them flavorless (5.8%) or expensive (4.4%) (24). Another similar study including university students indicated that 88.4% of the students consuming probiotics loved the taste, 79.1% were charmed by advertisements, and 84.9% benefitted from these products (23).

Limitations of this study: There is not enough data on the consumption of these products. Thus, there

was not sufficient literature to compare. Moreover, the sample of the present study may not reflect the general population. The power of this study is the large number of participants, as is done face to face.

Conclusions & advices

Consumption of probiotics is limited due to the fact that people do not have information on the products, the society is not sufficiently informed of the products and the price of the products is higher compared to other foodstuffs. Consumption of probiotic products by unhealthy participants showed increase by age. Although probiotic product consumption is important throughout life, their consumption should be encouraged in older age groups due to their protective features against health problems by informing the whole society accurately on the products.

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