ORIGINAL ARTICLE

A Survey on Shiraz Health Care Center Personnel's Knowledge and Attitudes Toward the Consumption of Probiotic Products in 2018

Aliasghar Masihi Nezhad[1], PhD; Amena Barikani[2], MD, PhD; Maryam Javadi[3], PhD

[1]Philosophy of Science in Food Hygiene, Department of environmental health engineering, Shiraz University of Medical Sciences, Shiraz, Iran
[2]Associate Professor of Social Medicine and Community Medicine Faculty of Medicine, Qazvin University of Medical Sciences, Qazvin, Iran
[3]Assistant Professor of Nutrition and Food Hygiene, School of Public Health Faculty of Medical Sciences, Qazvin, Iran

Correspondence:
Aliasghar Masihi Nezhad, PhD; Department of Environmental Health Engineering, University of Medical Sciences, Karimkhane-zand Blvd. Shiraz, Iran
Tel: +98 71 32305410
Email: amasihi@sums.ac.ir
Received: 10 April 2022
Revised: 30 May 2022
Accepted: 25 June 2022

Abstract

Background: Probiotics are non-pathogen microorganisms that confer a health benefit on the gut system. The Health personnel are responsible for treating the patients, which is a sensitive role; therefore, their knowledge, attitude, and consumption of probiotics are important.

Methods: A cross-sectional study was planned to evaluate personnel. Random sampling was conducted to select 136 persons as study samples from 275 personnel willing to participate in the study. Data collected using a self-made questionnaire consisted of demographic data, awareness, attitude, and behavioral items. Descriptive, correlation, and regression statistics were performed using SPSS ver. 22.

Results: Total awareness score of personnel about probiotics was medium. No significant associations were found between total awareness score and gender, education, and field of education (P>0.050) except for age (P=0.008) and acquaintance (P=0.003). The younger group and experienced participants were more aware of probiotics than others. Most of the personnel had positive attitudes about probiotics. The study showed no correlation between attitude and variables, including genus (P=0.150), education (P=0.507), field of study (P=0.756), and acquaintance of personnel (P=0.259). The personnel's overall behavior score did not correlate with genus (P=0.841), age (P=0.955), education level (P=o.527), field of study (P=0.955), and acquaintance (P=0.832). Logistic regression indicated that total awareness predicts personnel's behavior.

Conclusion: Shiraz health centers Personnel had no considerable awareness about probiotics. Personnel's attitudes toward probiotics were positive, but lack of knowledge, high price, and limited access to probiotic products resulted in low consumption.

Please cite this article as: Masihi Nezhad AA, Barikani A, Javadi M. A Survey on Shiraz Health Care Center Personnel's Knowledge and Attitudes Toward the Consumption of Probiotic Products in 2018. J Health Sci Surveillance Sys. 2022;10(3):293-300.

Keywords: Attitude, Awareness, Health personnel, Probiotics

Introduction

Probiotics are non-pathogen microorganisms that have beneficial effects on their host's health by the microbial balance in the gut system when using live and in sufficient amounts.[1] The certain positive functions of probiotics include anti-pathogenic activity, urogenital health care, anti-diabetic activities, anti-obesity, anti-inflammatory, anti-cancer, angiogenic, anti-allergic, treatment of diarrhea, competition with other microorganisms at intestinal sites to adhere and reside, reduction in blood pressure, normalization of blood cholesterol, metabolism of lactose and digestion of food, immunological response and protection from parasitic infection as gut microbiota

influence human brain development function, treatment of lactose intolerance, diarrhea, constipation, allergies, inflammatory bowel disease, irritable bowel syndrome and peptic ulcer, prevention of autoimmune diseases and lowering cholesterol effect.[2-6]

According to the theory of planned behavior, control the perceived behavior and subjective norms of individuals, reveals their intentions and consequently makes the behavior. Based on this theory, positive attitude and behavior of experts or popular people (in this study health personnel) toward an issue, persuades others (learners of health centers) to change their behavior about that issue. Thus the learners will become more likely to do the behavior supported by experts or poluar people.[7-9]

Amarauche and colleagues (2015) assessed the knowledge and perception of probiotics among medical science students and practitioners in Lagos State at Nigeria. They indicated insufficient knowledge and poor perception of probiotic benefits . They concluded that it is necessary to provide information about the availability, sources, and advantages of probiotics.[10]

Amarauche (2015) assessed the awareness and knowledge of healthcare professionals (HCPs) in Nigeria on probiotics. Participants were selected from major healthcare institutions in Nigeria's capital (Abuja). The study was set to assess four different categories of participants, including Physicians, Pharmacists, Dentists, and Nurses. Results showed that healthcare professionals had limited knowledge and awareness about probiotic products. Pharmacists were more knowledgeable.[11]

Sam Prasad and Rukmani Rajesvari (2017) studied the awareness of general dental practitioners of Chennai city, the state capital of Tamil Nadu in India. They found that all participants were aware of the term probiotic. The awareness of probiotic ingredients among younger participants was more than among the elders. 66 percent of the participants had consumed probiotics.[12]

Oliver and colleagues (2014) evaluated knowledge, perceptions, and use of probiotics and prebiotics by health care providers. 88 percent of participants were familiar with probiotics. Their perceptions about probiotics and prebiotics were positive (97 percent agreed).[13]

Sabina Fijan and colleagues (2019) conducted an international survey on knowledge of probiotics among health professionals. Evaluation of the knowledge of health professionals showed that most of the respondents knew probiotics. No significant difference in knowledge was found between males and females. The definition of probiotics was evaluated, and more than 82 percent of health professionals, 67 percent of nurses and midwives, less than 67 percent of psychologists, and also more females than males knew the correct definition. Most of the respondents believed probiotics have a beneficial effect. Most of the respondents (86.8%) had already used probiotics. Females (88.2%) consumed probiotics more than males (80.7%). Respondents had acquired their knowledge about probiotics from various sources, including books or expert magazines (53.3%), websites (34.9%), at work (28%), pharmacies (25%), and radio or TV (9.7%). More than half of all respondents (57.5%) wanted to learn more about probiotics.[14]

Soni and colleagues (2018) assessed the knowledge, attitude, and practice of probiotic use among health professionals in Ahmedabad, India. Participants were doctors, medical students, nutritionists, nutrition students, pharmacists, and pharmacy students. The survey revealed that most of the participants (93.25%) were aware of the term probiotics. There was no significant difference between doctors, pharmacist, and nutritionist, but medical students' knowledge was significantly higher than the nutrition students. Nutritionists and medical students have shown to be more knowledgeable about probiotics than professionals and students of other fields.[15]

Ababneh and his colleagues (2020) evaluated the knowledge, attitudes, and practice patterns of physicians and clinical pharmacists towards probiotics in different Jordanian healthcare institutions (HCPs). Around Fifty-nine percent of HCPs had positive attitudes toward probiotics. However, less than half of healthcare providers (41.0%) had ever recommended or prescribed probiotics to patients. The results of the study reveal that HCPs have limited knowledge of probiotics. They had positive attitudes toward probiotics without any affect on their behavior. Therefore, health providers need additional training and education about probiotics.[16]

Salari and colleagues assessed the Knowledge and Consumption Level of Probiotics Dairy Products among the Students and Staff at Mashhad University of Medical Sciences (2020). They reported a significant association between the consumption of probiotic dairy products and education level ($P<0.05$). However, despite high awareness, they did not consume adequate amounts of probiotic dairy products. Salari noticed it is necessary to promote the students' knowledge regarding the definition, oral benefits, and sources of probiotics. Participants had acquired their information regarding probiotics from various sources, including books (19.76%), pamphlets (3.23%), internet (28.23%), television (2.82%), radio (0.40%), teacher (14.92%), friends (14.11%) and product information on the labels (16.53%). Most of the dairy products consumed in this study were yogurt and milk (37.2% and 29.4%, respectively).[17]

One of the most important programs of healthcare personnel for training to the patients is nutrition. Human beings require foods with higher nutritional values so healthcare personnel should have up to date

information about new and functional foods because of their sensitive role in training food safety and hygiene to people because they should advise people to consume functional and probiotic products as safe nutrition diets. This way, the personnel can promote people's awareness and attitudes and compel new beneficial nutritional behavior. So this research aimed to evaluate the knowledge, awareness, and attitude of Shiraz Health Centers (Shiraz city, Fars Province in the south region of Iran, Iran) about probiotic products and behavioral consumption of these products.

Methods

A cross-sectional study planned to survey the awareness and attitude of Shiraz health centers personnel about probiotics and consumption of these kinds of products. All governmental health centers were investigated and their personnel were enumerated. Multistage random sampling was conducted to select the sample size. From 45 governmental health care centers, including 275 persons working at different areas of Shiraz city, 25 centers consist of 136 persons were selected. Data were collected using a self-made questionnaire consisting of three parts: demographic characteristics data (age, sex, education, income, etc.), awareness (13-point scale), attitude (15-point scale), and behavioral or consumption (4-point scale) questions. To determine the validity and reliability of questions, the authors evaluated data from 25 Questionnaires by SPSS software version 22. Experts in a pilot study confirmed the reliability coefficient (Cronbach's alpha). Re-test was used and invalid questions were removed. Obtained Cronbach's alpha for awareness, attitude, and consumption questions is 0.718, 0.766, and 1, respectively.

To evaluate awareness, attitude, and consumption of probiotics by personnel, the authors summarized all related questions in three classified variables.

Personnel working at all parts of health centers that were willing to cooperate the study answered the questionnaire. The authors assured the personnel that their responses to the self-made questionnaire are secured and is just used for research . Descriptive statistics was used to determine awareness, attitude, and behavior of Shiraz health centers personnel about probiotics. Correlation tests were used to realize the relation between demographic characteristics and three variables, including awareness, attitudes, and consumption of probiotic products. Logistic regression model was performed to predict variables and factors affecting personnel's behavior toward probiotics consumption.

Results

Demographic Data

Table 1 presents demographics of Shiraz health center personnel . 136 respondents were working in 25 chosen clinics. In summary, 20.6 percent of the participants were men and 79.4 percent were women. The average age was 37 years, and most of the participants had Bachelor in health sciences.

Knowledge and Awareness about Probiotic

Data of questionnaires showed that around 21 persons (15.44%) of Shiraz health centers personnel had not seen or heard about probiotic products ,while 115 (84.56%) respondents had seen or heard about probiotic products.

Table 1: Demographics of Shiraz health centers personnel (N=136)

Demographic variables		Total (n)	(%)Percentage
Sex	Male	28	20.6
	Female	108	79.4
Age range (Missing=12)	Group 1 (24 or less)	8	5.9
	Group 2 (25–34)	34	25
	Group 4 (35–44)	56	41.2
	Group 4 (45 and upper)	26	19.1
Level of Education			
Diploma		14	9.6
Senior Secondary		26	19.1
Bachelor's Degree		67	49.3
Master's Degree		11	8.1
Doctorate or Professional		18	13.2

Table 2: Levels of awareness scores and frequencies among Shiraz health centers personnel about probiotic products

		Frequency	Valid Percent
Awareness score	Unaware	12	10.4
	Low awareness	22	19.1
	Medium awareness	30	26.1
	High awareness	51	44.3
	Total	115	100.0

Table 2 shows that 44.3 percent of participants had good or high awareness, and the others had no knowledge.

As Table 3 shows that advertisements in the public messenger networks (broadcasting TV/Radio), physicians, newspapers, nutrition experts, producers, products and their labels, friends and relatives, hygiene experts, products distributors (supermarket/ stores), journals and in some fewer cases internet and library (books) provided most information about probiotics, respectively.

Attitude about Probiotic

Around 69 percent of personnel had a positive attitude toward probiotic products whereas 1.8 percent strongly disagreed and 29.6 percent had no opinion (Table 4).

Consumption of Probiotic Products

Most of the participants never consumed probiotic products or had low consumption, and 48 percent of personnel had acceptable consumption of these kinds of products (Table 5). Personnels reported that they preferredprobiotic products, including cheese (59.2%), yogurt (19.1%), milk (16.5%), and doogh (5.2%), respectively.

Result of Regression Model

The regression model in Table 6 identifies some factors, including gender, age, education and acquaintancedid not affect the probiotics consumption individually, but staff's awareness can predict (65%) the change in behavior toward consumption of these products.

According to Table 7, around 39 percent of health care center personnel were not aware of the properties of the probiotics. Staff's low income, and inaccessibility of probiotic products especially in the neighborhood stores were the other main reasons for not consuming probiotics.

Table 8 presents the awareness, attitude, and consumption of probiotics by Shiraz health centers personnel.

According to our ranking method, personnel's knowledge about probiotics is average; therefore, overall awareness is not acceptable.

Table 3: Source of information for Shiraz health centers personnel about probiotic products

Source of personnel information	Frequency	Valid percent
Producers	11	9.09
Products (Labels)	10	8.26
Friends/relatives	10	8.26
Products distributors supermarket/pharmacies)	6	4.96
Advertisements (broadcasting TV/Radio)	23	19.00
Internet	1	0.82
Newspapers	13	10.74
Nutrition experts	12	9.92
Physicians	20	16.53
Journals	6	4.96
Library (Books)	1	0.82
Hygiene experts	8	6.61

Table 4: Frequency of attitude variables according to Likert Scale about probiotic products among Shiraz health centers personnel

Ranges of attitude scores (15 point scale)		Frequency	Valid percent
Valid	Strongly disagree	1	0.87
	Disagree	1	0.87
	Neutral	34	29.57
	Agree	66	57.39
	Strongly agree	13	11.3
	Total	115	100.0

Table 5: Frequency of probiotic products consumption by Shiraz health centers personnel about probiotic products

Ranges of consumption scores (4 point scale)	Frequency	Valid percent
Never consume probiotic products	32	27.8
Once more or very low consumption of probiotic products	35	30.4
Medium consumption of probiotic products	42	36.5
High consumption of probiotic products	6	5.2
Total	115	100.0

Table 6: Summary of logistic regression analysis for variables affecting Consumption of probiotics among Shiraz health centers personnel

Model	Prediction percent	Exp (B)	P
(Constant): total awareness score	65%[a]	1.266	0.000[b]
Genus			0.514
Age			0.311
Education level			0.747
Acquaintance			0.439

[a] Dependent variable: consumption scores; [b] Predictors in the model: (constant), total awareness scores

Table 7: Frequency and percentage for not consuming probiotic products by Shiraz health centers personnel

Reasons for not consuming probiotics	Frequency	Valid percent
Not aware of probiotics properties	53	38.97
The products are expensive (not affordable)	32	23.53
Not found in my neighborhood stores	26	19.12
Felt no need of taking it	8	5.88
Have no effect on health	7	5.15
Probably side effects	5	3.67
It's not my favorite item	5	3.67
Total	136	100%

Table 8: Total scores (Mean±S.E) of awareness, attitude and consumption of probiotic products among Shiraz health centers personnel (N=115)

Variables/Scores	Total Awareness Score [a] (13 point scale)	Total Attitude Score [b] (15 point scale)	Total Consumption score [c] (4 point scale)
Mean±S.E	7.01±0.330	10.74±0.169	1.19±0.085

a: 0-2=unaware, 3-4=weak awareness, 5-8=medium awareness, 9-13=high awareness; b: 3=strongly disagree, 4-6=disagree, 7-9=neutral, 10-12=agree, 13-15=strongly agree; c: 0-1=no consumption, 2=low consumption, 3=medium consumption, 4=high consumption

Table 9: Awareness, attitude, and consumption scores about probiotic products among Shiraz health centers personnel and their relation to demographic variables

Variables/Scores	Total Awareness Score (13 point scale)	Total Attitude Score (15 point scale)	Total Consumption score (4 point scale)
Genus P value	0.213	0.150	0.841
Age P value	0.008	0.035	0.963
Education level P value	0.232	0.507	0.527
Field of education P value	0.189	0.756	0.955
Acquaintance P value	0.003	0.259	0.832

Personnel's attitudes toward probiotics was high and ranked 'strongly agree' according to the likert Scale.

Most of the participants agreed with probutics properties and consumption and receiving more information about probiotics. Mean score of behavioral assay demonstrates that consumption of probiotic products by Shiraz health centers personnel is low (Table 9).

Discussion

Limitations and advantages of our work: The long distance between heath centers and difficult access to health centers, especially at traffic jam, coordination with the health centers personnel and their managers before starting the survey, and high female-to-male ratio approximately 5:1 were among the limitations of the study. On the other side, personnel were willing to participate in the survey and learn new issues related to health matter.

Awareness of probiotics: We assessed the knowledge and awareness of Shiraz health centers personnel about probiotics. Results showed although 84.56 percent of personnel saw probiotic products or heard about foods or products that were named probiotics, assessing the personnel's awareness about probiotics presented medium awareness and lack of

knowledge around probiotics and their properties because personnel's awareness score was 7.01 (13 point scale). The other reason for this claim is that most personnel had no correct information about the definition of probiotics as only 22.6 percent of personnel chose the correct answer. Fijan and colleagues (2019) indicated that more than 82 percent of health professionals, 67 percent of nurses and midwives, less than 67 percent of psychologists, and more female than male knew the correct definition of probiotics.

The current study's results about personnel's awareness about probiotics is consistent with some studies done before. For example, assessing the awareness and knowledge of medical Science Students and Practitioners and healthcare professionals (HCPs) in Nigeria on probiotics by Amarauche (2015, 2016) showed low participants' knowledge. Ababneh and colleagues (2020) evaluated knowledge, attitudes, and practice patterns towards probiotics by Jordanian healthcare providers (HCPs). Half of the providers had fair knowledge about probiotics. Conversely, other studies stated high percentage of their participants were aware of probiotic products and reported different results in contrast with our results.[12-15, 17, 18]

Assessing Shiraz health centers personnel's awareness about probiotics presented that females were more aware of probiotics than males, but there was no correlation between gender and awareness of the word "probiotic" (P=0.213). In this case, our results are in parallel with the results of some other researchers. Fijan and colleagues (2019) found no significant difference between male and female participants' knowledge. Other research results reported significant correlation between gender and awareness about probiotics .

Eyad Altamimi and colleagues (2019) investigated medical students'knowledge and attitudes towards probiotics at the Jordan University of Science and Technology, Irbid. More than half of the students defined probiotics correctly, and their gender did not affect their knowledge.

The youngest participants (under 24 years old) were more aware of probiotics than others (P=0.008). Obviously, young personnel are more willing to find new and functional food products than other age groups. Older groups of health personnel in Shiraz might not be willing to update their knowledge on current issues in health sciences and new functional foods. Some researchers confirmed that younger participants' awareness about probiotics was more than the elderly . Sam Prasad and Rukmani Rajesvari (2017) showed that the awareness of probiotics among younger participants was more than the elderly.

Graduated participants had higher awareness about probiotics than others, but no considerable correlation was found between awareness and educational level (P=0.232).

Assessing the effect of variable "field of study" on awareness indicated that although dentist, nutritionists and physicians had higher awareness than other fields, there was not considerable differences between mean scores (P=0.189). This finding is congruent with some other studies. For example, Sam Prasad and Ukmani Rajesvari (2017) Studied the General dental practitioners' awareness about probiotics . They found that all participants were aware of the term probiotics. Eyad Altamimi and colleagues (2019) reported that medical students in Jordan had an acceptable knowledge about probiotics. Also, Soni and colleagues (2018) assessed thehealth professionals' knowledge about probiotics and the result identified no significant difference between doctors, pharmacists and nutritionists , but medical students' knowledge was significantly higher than the nutrition students.

We analyzed the correlation between personnel acquaintance and their awareness . Analysis showed personnel who had more acquaintance were more knowledgeable about probiotics than others (P=0.003). Therefore, it seems experienced personnel were sensitive to their health status and are researching and looking for more valuable foods such as probiotic products or functional foods.

Source of information about probiotics: Shiraz health care personnel obtained knowledge about probiotics mostly through advertisements on the public messenger networks (broadcasting TV/Radio), physicians, newspapers, and nutrient experts (Table 5). According to our results, personnel are more willing to acquire their information from public media than books or scientific resources.

Sabina Fijan and colleagues (2019) reported that the main information source of participants about probiotics were books or expert magazines (53.3%), websites (34.9%), at work (28%), pharmacies (25%), and radio or TV (9.7%). Salari and colleagues (2020) showed that Participants had acquired their information regarding probiotics from various sources, including books (19.76%), pamphlets (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%).

Attitude about probiotics: Our survey results indicated that most Shiraz heath center personnel (69%) had positive attitudes and were interested in learning more about probiotics. The attitudes score of personnel was 10.74 (15-point scale) and ranked 'agree' according to Likert Scale. Young personnel had higher attitude score than other age groups. Variables, including genus (P=0.150), age (P=0.101), education (P=0.507), field of study (P=0.756), and acquaintance (P=0.259) did not affect their attitudes significantly.

Eyad Altamimi and colleagues (2019) indicated that most students had a positive attitude toward probiotics and were interested in learning more about probiotics, but Amarauche and colleagues (2015) indicated poor perception of benefits of probiotics.

Research of Ababneh and his colleagues (2020) revealed that participants had positive attitudes toward probiotics but it did not affect their behavior.

Consumption of probiotics: We assessed the behavior of Shiraz health centers personnel regarding the consumption of probiotic products. Results of our study showed that 58.2 percent of personnel did not consume probiotics or just tried it once ;consequently, personnel'sconsumption was very low and ranked 1.19 on 4-points scale. Furthermore, our results indicated that women consumed more probiotic products than men, but no significant correlation was found between consumption of these products and variables such as genus (P=0.841), age (P=0.955), education level (P=o.527), field of study (P=0.955), and acquaintance (P=0.832).

Regression results indicated that only awareness predicted personnel's behavior (65%) toward the consumption of the probiotic products (Table 6). It means that awareness or lack of information about the properties of probiotics, high price, and low availability of probiotic products at some areas, can predict or mayaffect personnel's decision to consume probiotic products. Current study results confirmed that more awareness of participants leads to consumption of these products. Sam Prasad and Rukmani Rajesvari (2017) reported that all participants were aware of probiotics, and 66 percent of them had consumed probiotics.

Sabina Fijan and colleagues (2019) reported that most of the respondents were knowledgeable about probiotics; 86.8 percent had already used probiotics, and females (88.2%) consumed probiotics more than males (80.7%).

Shiraz health center personnel's attitude toward consumption of probiotics was positive but it didn't change their behavior toward consuming probiotic products. Ababneh and his colleagues (2020) found that participants' positive attitudes toward probiotics did not affect their behavior toward consuming these products.

Shiraz health centers personnel were interested in the consumption of dairy probiotic products, and around 60 percent of participants preferred to consume probiotic cheese over other dairy products [other preferences were yogurt (19.1%), milk (16.5%), and doogh (5.2%) a kind of drink yogurt)].

Salari and colleagues (2020) reported that yogurt and milk (37.2% and 29.4%, respectively) were the most probiotic products that participants consumed.

The study of Sabina Fijan and colleagues (2019) showed that most respondents (86.8%) had used probiotics. Females (88.2%) consumed probiotics more than males (80.7%).

Conclusion

Our survey indicated that Shiraz health centers personnel had no adequate scientific knowledge about probiotics and their properties. They even had no correct information on definition of probiotics; therefore, they require to study or search about these kinds of products and understand the beneficial effects of probiotics consumption .

Demographic characteristics, including gender, educational level, andfield of study did not affect personnel's awareness, but the youngest and experienced personnel had a higher awareness than the others. Personnel are more willing to acquire their information from public media than books or scientific resources.

Shiraz health centers personnel's attitude about probiotics were positive because they were interested in searching and learning more about probiotics. Analysis indicated that personnel's demographic characteristics such as gender, age, educational level, field of study, and acquaintance did not affect their attitudes.

We assessed Shiraz health centers personnel's attitude toward the consumption of probiotic products. Results of our study showed personnel's consumption was very low and more than half of personnel did not consume probiotics. Despite personnel's positive attitudes and relative awareness, lack of information about the properties of probiotics, high price, and low availability of probiotic products in some areas resulted in low consumption.

Recommendations: To improve the level of awareness and knowledge of probiotics among Shiraz health centers personnel (SHCPs) in Iran, it is necessary to perform a lecture, seminar, online training or distribute a pamphlet. Producers and public media may also help to improve personnel's awareness and knowledge because they supply high portion of the respondent s' knowledge and information about probiotics. On the other side, covering probiotics in medical and health sciences school curricula may promote students' knowledge and future healthcare personnel's.

Conflicts of interest: None declared.

References

1 Morelli L, Capurso L. FAO/WHO guidelines on probiotics: 10 years later. Journal of clinical gastroenterology. 2012;46:S1-S2.

2 Cogo E, Papadogianis P. Characteristics of 218 Recent Reviews on Natural Health Products in Integrative

Cancer Care: A bibliometric analysis of trends in the human research literature. J Orthomol Med. 2018;33:1-13.

3 Homayouni A, Alizadeh M, Alikhah H, Zijah V. Functional dairy probiotic food development: trends, concepts, and products. Probiotics. 2012:197-212.

4 Homayouni Rad A. Therapeutical effects of functional probiotic, prebiotic and synbiotic foods. Tabriz: Tabriz University of Medical Sciences. 2008:17-22.

5 Peters V, Van de Steeg E, Van Bilsen J, Meijerink M. Mechanisms and immunomodulatory properties of pre-and probiotics. Beneficial microbes. 2019;10(3):225-36.

6 Sanap DS, Garje MA, Godge GR. Probiotics, their health benefits and applications for development of human health: A review. Journal of Drug Delivery and Therapeutics. 2019;9(4-s):631-40.

7 Ajzen I. The theory of planned behavior: Frequently asked questions. Human Behavior and Emerging Technologies. 2020;2(4):314-24.

8 Ajzen I. From intentions to actions: A theory of planned behavior. Action control: Springer; 1985. p. 11-39.

9 Fishbein M, Ajzen I. Belief, attitude, intention, and behavior: An introduction to theory and research. Philosophy and Rhetoric. 1977;10(2).

10 Chukwu EE, Nwaokorie FO, Yisau JI, Coker AO. Assessment of the knowledge and perception of probiotics among medical science students and practitioners in Lagos state. British Journal of Medicine and Medical Research. 2015;5(10):1239.

11 Amarauche CO. Assessing the awareness and knowledge on the use of probiotics by healthcare professionals in Nigeria. Journal of Young Pharmacists. 2015;8(1):53.

12 Prasad S, Rajesvari R. Probiotic awareness among general dentists in Chennai. Journal of Oral Medicine, Oral Surgery, Oral Pathology and Oral Radiology. 2017;3:45-7.

13 Oliver L, Rasmussen H, Gregoire MB, Chen Y. Health care provider's knowledge, perceptions, and use of probiotics and prebiotics. Topics in Clinical Nutrition. 2014;29(2):139-49.

14 Fijan S, Frauwallner A, Varga L, Langerholc T, Rogelj I, Lorber M, et al. Health professionals' knowledge of probiotics: an international survey. International journal of environmental research and public health. 2019;16(17):3128.

15 Soni R, Tank K, Jain N. Knowledge, attitude and practice of health professionals about probiotic use in Ahmedabad, India. Nutrition & Food Science. 2018.

16 Ababneh M, Elrashed N, Al-Azayzih A. Evaluation of Jordanian healthcare providers' knowledge, attitudes, and practice patterns towards probiotics. Expert review of pharmacoeconomics & outcomes research. 2020;20(1):93-7.

17 Salari A, Hashemi M, Mardani A, Dadgar Moghadam M, Khyrati Z, Yousefian S, et al. Assessment of Knowledge and Consumption Level of Probiotics Dairy Products among the Students and Staff of Mashhad University of Medical Sciences. Journal of Nutrition, Fasting and Health. 2020;8(3):186-91.

18 Eyad A, Hamad MRAA, Kenan MRA, Fanni AKT. Medical students' knowledge of probiotics and their health usage in Jordan. International Journal of Medical Research & Health Sciences. 2019;8(4):124-30.