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The Knowledge and Perceptions Regarding Probiotics Among the People of Al-Qassim Region, Saudi Arabia

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Abstract

Probiotics are defined as live strains of strictly selected microorganisms which, when administered in adequate amounts, confer a health benefit to the host. There are naturally available probiotics that are present in fermented food types, and other commercial newly manufactured ones that differ in strains and usage. The aim of this research is to find out the knowledge, attitude, and perception about probiotics among Saudi population in Al Qassim region. This observational type of cross-sectional study included 669 participants. Data was collected using the self-administered online questionnaire. The data were entered in Excel and analyzed using EpiInfo7 statistical software. The majority of participants were between 18 and 25 years (44%) age group. 83% of them were females, and 17% were males. The knowledge about probiotics was very limited. Only 26% of the participants had heard about probiotics, whereby social media was their main source of knowledge (35%). The participants with college degrees education, showed more knowledge about probiotics (70%) with significant P value= 0.015. 30% indicated that yoghurt was a source of probiotics. 20% of the subjects consumed probiotics, and 44% of them mentioned that they consumed probiotics to maintain good gastrointestinal health and immune system followed by 13% of the participants consumed probiotics to treat antibiotic-associated diarrheas and other abdominal discomforts. And only 24% of them took probiotics with a meal. Probiotics are still a debatable topic for many people, and the knowledge about the topic is not well understood. Also, there is a huge gap in the probiotics knowledge among the Saudi population. This gap need to be addressed on different levels to be able to reach the widest range of people to facilitate the growth of a healthy generation.

Keywords: Probiotics, Immunity, Gastrointestinal health, Yogurt, Lactobacillus

Introduction

"Probiotic" means "for life" is derived from Greek language and was coined by Kollath in 1953. the United Nations Food and Agriculture Organization (FAO) and the World Health Organization (WHO) in 2001 defined Probiotics as "live microorganisms which upon ingestion in sufficient concentrations can exert health benefits to the host." (Hill C, et al.2014). Beneficial probiotic bacterial strains reported are species belonging to the genera Lactobacillus and Bifidobacterium. The representative species include Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Bifidobacterium lactis, Bifidobacterium longum, and Bifidobacterium bifidum (Kailasapathy K, Chin J.2000).

The major health benefits attributed to probiotics use is associated with the improvement of gastrointestinal microflora, and treating infections associated with gastrointestinal tract: infections, antibiotic-associated diarrhea, constipation and as therapeutic agent against irritable bowel syndrome and inflammatory bowel diseases. It is also used for the enhancement of immune system, reduction of serum cholesterol, prevention of atopic allergies, cancer prevention, antihypertensive effects, and also to improve lactose metabolism. (Nagpal R et al. 2012) Moreover, according to the American Family Physician Association, there are typically few or no adverse effects associated with probiotic use. Occasionally, flatulence or mild abdominal discomfort, usually self-limited, are reported. (AAFP, 2008) The protective role of the probiotic bacteria is by competing with the intestinal pathogens by way of releasing antibacterial substances such as bacteriocins and metabolites like acetic acid and lactic acid. (Behnsen J et al.2013).

The natural sources of probiotics are fermented foods such as yogurts, dairy, and dairy-related products and vegetables are main sources of normal flora to the gut. (Agrawal, 2005) Probiotics supplements using specific strains of *Lactobacillus* and *Bifidobacterium* species are available in the form of tablets, capsules, granules, and liquids. (Bosch M et al.2012). Probiotics are also available in various other varieties in the market such as: functional food & beverages - non-dairy beverages, breakfast cereal, baked foods, fermented meat products, dry-food probiotics; dietary supplements - food supplements and nutritional supplements; Specialty nutrients in the form of infant formulations and as animal feed (Ranadheera, C et al.2017).

There is a need to create a positive attitude of the people towards probiotic use as not many are aware of probiotics and the health benefits associated with the use of probiotics. The present study was aimed at finding out the knowledge, attitude, and practices of people of Al Qassim region towards the use of the probiotics.

Method

This cross-sectional study was conducted from March to April 2019 in Al Qassim region, KSA, and the data was collected through an online self-administered questionnaire, which was translated to Arabic language. The inclusion criteria being that the participants had to be above 18 years of age and belonged to Qassim region. The questionnaire consisted of two parts. The first section included questions on demographic characteristics, and the second section included questions on the knowledge, attitude, and practices associated with probiotic use. Informed consent was obtained from all participants before participating in the survey. The ethical approval for this study was obtained from the Departmental Research Review Committee, College of Applied Medical Sciences, Qassim University. The data were entered in Microsoft Excel and analyzed using EPI INFO7 software. Associations between outcome and predictor variables were analyzed using Chi-square, and the level of statistical significance was set at 0.05.

Results

A total of 669 participants took part in the study. The details of the demographic characteristics are provided in table 1. Majority of the participants were females 83%, and males were 17%. Majority of the study population 44.39% were from the age group 18-25 years. 70% of the participants had a college level of education. Only 26% of the participants were aware of probiotics, and their main source of information was social media 35%, followed by family and friend 15%. Table 1 also shows a significant association between the level of education and awareness of probiotics with $P = 0.01$. Figure 1, shows the knowledge of the people regarding the probiotic term. 30% of them associated probiotics with yogurt, 23% with *Lactobacillus*, followed by *Bifidobacterium* 15%, milk 13%, and the rest 53% don't know. 85% of the participants were not aware of the required bacterial dose needed for optimum effect.

Out of 669 participants, 19.6% of participants consumed probiotics. The questions on practices associated with probiotic use were assessed among these 131 participants. Table 2 projects the questions and the frequency of the options chosen. When asked how did they choose which probiotic to use, 19.9% answered depending on number of bacteria, followed by the manufacturing company. But 35.9% did not care about any of the above-mentioned factors. 24.4% of them consumed probiotics with the meal. 33.6% did not follow any pattern of consumption. Figure 2 shows, 44.27% consumed probiotics to maintain good gastrointestinal health and immune

system, 13.7% consumed probiotics to treat antibiotic-associated side-effects and other abdominal side effects and 5% is to reduce Inflammatory Bowel Disease. 31.3% agreed that probiotics were beneficial to them, whereas 44.3% were not sure of the same. Figure 3 shows, 53.44% of the participants never experienced any side effects following the consumption of probiotics, 4.6% experienced gas and bloating 2.3% headache, 1.5% thirst and allergy symptoms and 0.8% experienced constipation. 57.3% expressed the opinion that they would continue using probiotics in the future, whereas the rest do not know. When asked would they recommend probiotics to others: 66.9% said yes, rest 30% don't know.

Table 1: Association between demographic characteristics of the study participants and their awareness about probiotics

DEMOGRAPHIC CHARACTERISTICS	FREQUENCY (%) N = 669	P value
AGE		0.34
18 - 25	297(44.39%)	
26 - 32	133(19.88%)	
33 – 40	114(17.04%)	
>40	125(18.68%)	
GENDER		0.06
Male	116(17.34%)	
Female	553(82.66%)	
SOCIAL STATUS		0.2
Married	354(52.91%)	
Unmarried	315(47.09%)	
EDUCATION LEVEL		0.01*
Primary	21(3.14%)	
Secondary	139(20.78%)	
Collage	474(70.85%)	
University and above	32(4.78%)	
None	3(0.45%)	

*significant association

From table 1 we see the age, 18-25 years was the highest proportion to answered to the Questionnaire (44.39%) (When we see the Social Status married, was the highest proportion (52.91%), When we see the education level, the Collage Was the highest proportion (70.85%) and it was significantly associated with awareness of probiotics, with P = 0.01.

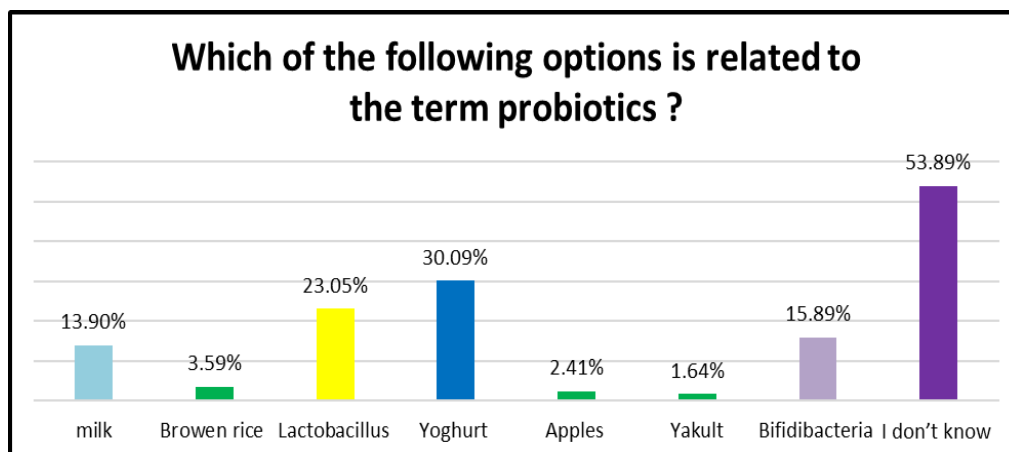


Figure 1: The bar chart above, indicates how people can identify the connection of some food items and bacterial species with probiotics. The majority (53%) stated that they don't know, and the rest mainly pointed out Lactobacillus (23%) and Yoghurt (30%).

Table 2: Practices and attitude related to Probiotics use

Practices	FREQUENCY (%) N = 669
Do you consume probiotics?	
Yes	131 (19.58%)
No	538 (80.42%)
FREQUENCY (%) N = 131	
How do you select which probiotics to consume?	
Depending on the number of bacteria	26 (19.85%)
Depending on the On price	4 (3.05%)
Depending on the On company	24 (18.32%)
I don't care	47 (35.88%)
I don't know	30 (22.90%)
When do you consume them?	
Before meal	17 (12.98%)
With meal	32 (24.43%)
Within 30 minutes following a meal	10 (7.63%)
after a meal	20 (15.27%)
I don't know	52(39.69%)
How often do you consume them?	
Once a day	30 (22.90%)
Once in 2 day	6 (4.58%)
Once a weak	10 (7.63%)
Do not follow any pattern	44 (33.59%)
As and when required	10 (7.63%)
I don't know	31(23.66%)
Were probiotics beneficial to you?	
Yes	41 (31.30%)
NO	1 (0.76%)
Not sure	58 (44.27%)
I don't know	31 (23.66%)
Attitude	FREQUENCY (%) N = 131
Will you continue using them in the future?	
Yes	75 (57.25%)
No	7 (5.34%)
I don't know	49 (37.4%)
Do you Recommend others to take probiotics?	
yes	87 (66.92%)
No	4 (3.08%)
I don't know	39 (30%)

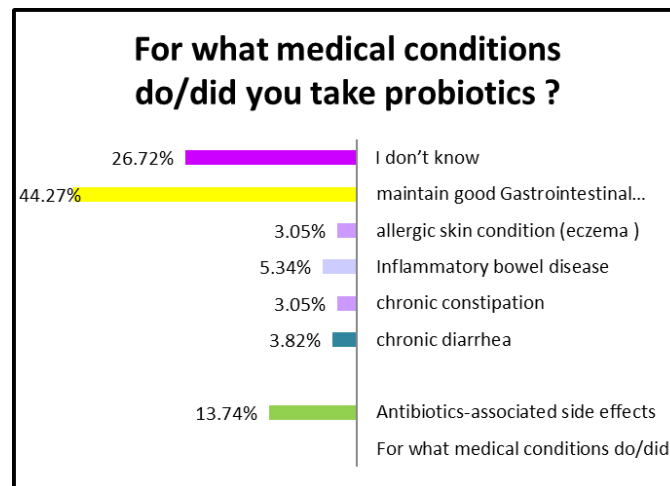


Figure 2: The bar chart, is showing the reasons that caused the participants to take probiotics, 5% is to reduce Inflammatory Bowel Disease, 13% to reduce abdominal side effects, and the majority 44% indicated that it's to maintain good gastro-intestinal health

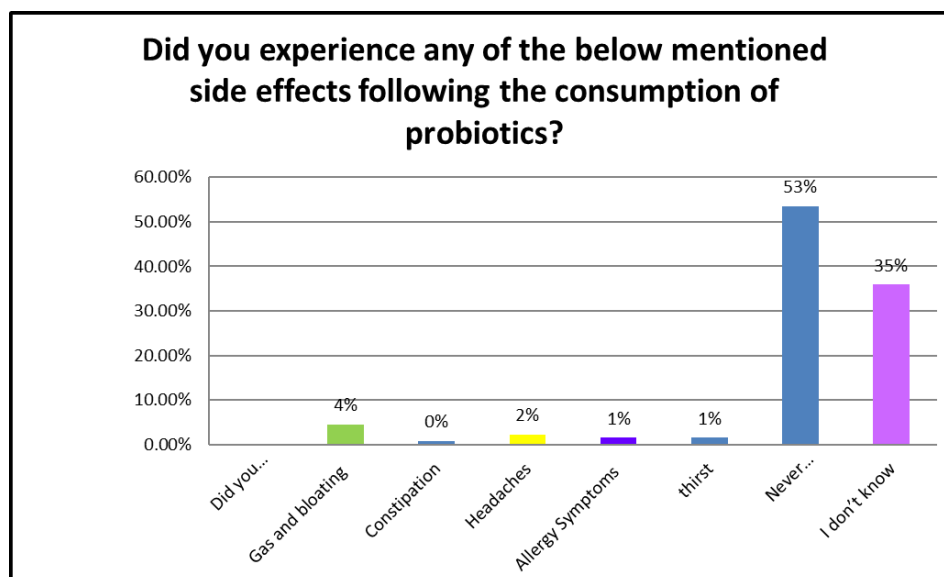


Figure 3: The bar chart above indicates that more than half of the participants did not experience any side effects after consuming probiotics (53%), Minorities experienced bloating and allergies, 4% had gas and bloating, while 2% had a headache while the rest do not know

Discussion

In order to assess the knowledge and the perceptions of the Saudi population about probiotics, this study was conducted. The literature suggests that people do not know much about probiotics, (Annunziata, 2013) and that was reflected in this study. For instance, Annunziata (2013) indicated that “customer groups significantly differ in their evaluation of perceived healthiness of functional foods and in the importance attached to price and brand” (Annunziata, 2013).

The results in the previous section showed clearly that the participants in which the study was subjected to, have minor knowledge about probiotics and how it can be used. Out of the total subjects, 73% did not have any idea about probiotics. This is considered relatively a high percentage, since it reflects that a big portion of people is not aware of the availability of probiotics. This shows that they were not told before about probiotics from healthcare institutions, and also they did not read before anything related to this topic. The percentage of people

that don't know about probiotics is relatively higher than other studies, where Betz (2015) indicated that 43% of participants were aware of probiotics (Betz, 2015). On the contrary, another study in Nigeria targeting clinicians, where the study showed that out of 62 clinicians, only 3 (4.8%) indicated that they are familiar with the use of probiotics". (Anukam, 2005) This shows that the geographical location, and the public health awareness in a society plays a role in the probiotics knowledge in a country.

The main source of information for participants was social media, where it seemed to be playing an important role in educating people (35% knew about probiotics from social media). This is studied in literature back in 2013, and our findings agreed with the studies done. Moorhead (2013) suggested that social media platforms will soon take important actions towards spreading awareness across communities with respect to health education. Results also show that only 7% of participants knew their information about probiotics from their doctor, which is not a good news because doctors should play an important role in clarifying such issues to patients (NCCIH, 2015).

A good portion of the subject knew that probiotics are linked to yoghurt. And that it helps in preventing and treating constipation. NCCIH showed that people since ages consumed probiotics as cure for many problems, without knowing what strains it contained. (NCCIH, 2015) This is clear in Betz (2015) study where 72% of the participants took their probiotics from yoghurt, 20% dairy drinks, 7% from pills, and 1% from cereals.

Upon questioning the required dose of probiotics, around 85% did not have any answer about it. Such results clearly note that even people taking probiotics are not consuming it out of a good knowledge about it, but just because they heard some rumors about it. In order to measure this issue specifically, results from table 2 show that 15% consume probiotics after a meal, while 13% before food, 24% said that they take their dose with the meal, and 7% after 30 minutes after a meal. The rest do not take commercial probiotics. This indicates that participants do not have any idea about how the stomach HCL kills the probiotics if ingested in the morning or before a meal, and even the subjects that indicate consuming after a meal did not appear to be knowing the real reason behind it. This piece of information is not easily found in literature, where the majority of studies address the knowledge and not the way of which probiotics are taken. Betz (2015) study indicated that 40% consume probiotics daily, and 34% do not stick to a pattern.

Examining further issues addressed in the questionnaire, such as side effects, the data collected matched the literature reviewed, where participants that previously consumed probiotics did not have any highlighted side effects, effects, such as dangerous infections, in individuals with severe underlying medical complications. Studies about the side effects of probiotics are done with respect to strains, which is not statistically comparable to this study.

Understanding the different factors that may lead to some people knowing about probiotics and others no, was also studied, in which the table 1 in the previous section showed that the best age to be able to know about probiotics is between eighteen and twenty-five years old. According to the Suchman (1965) people in this age tend to be more curious about the medical information, and today with the era of technology this information is readily available over the internet and can be ready by all age groups. (Suchman, 1965) In Betz (2015) study the most age group with the highest knowledge of probiotics was below 45 years old (Betz, 2015).

Furthermore, assessing the knowledge with respect to education showed that College level participants are more prone to such information, likewise married couples. Betz (2015) indicated this in his study by stating "Patients with more years of education were more likely to be familiar with the term probiotic" This can be explained since a couple that are preparing to have a family may read more and do research about growing a family in a healthy manner. For this reason, the knowledge about probiotics may be higher and especially among females.

As part of follow-up for the future, participants were asked if they would take probiotics, or they would recommend someone to take probiotics; the answers were 57% and 66% respectively; and that is because 23% do not know about any benefits of probiotics, and 44% are not sure about it.

Oliver (2014) study suggests that in order for people to recommend probiotics for one another, a healthcare provider should recommend it first, and her study indicated that 45% of healthcare providers recommend probiotics, and 78% of dietitians do that also, where it was stated as well that “Recommendation practices may be influenced by knowledge” (Oliver, 2014).

Conclusion

Probiotics are still a debatable topic for many people, and the knowledge about the topic is not well understood. Also, there is a huge gap in the probiotics knowledge among the Saudi population. This gap needs to be addressed on different levels to be able to reach the widest range of people. This can be on the level of the doctors, hospital campaigns, social media awareness posters, or even public speeches. With the current era of technology, healthcare providers and institutions should take an advantage of the available tools to spread to the world the knowledge of probiotics and aid in the growth of a healthy generation.

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