مجلة البحوث الأكاديمية

Journal homepage: www.lam.edu.ly

Community awareness of probiotics importance in Adults, Misurata – Libya

NourEdin H. Elrmalli[*1], Mohamed Elmalimadi[2] ,
Heaim Ehshibani[3], Aisha Al-dola [4], and Isra Aboalayam[5]

[1] Food and Drug Control Center (FDCC) Misurata – Libya
[2] Department of Chemistry, Faculty of Education, University of Misurata, Misurata, Libya
[3,4,5] Department of Nutrition, Faculty of Medical Technology, Misurata, Misurata, Libya
*E-mail: Nouredinermali@gmail.com[1], M.elmalimadi@edu.misurataedu.ly[2]

Abstract— **Background**: *The word "Probiotics" is derived from a Greek word in which "Pro" means favor and "Bios" means life. Probiotics are nonpathogenic microorganism and are beneficial for its host as they improve microbial load in gastrointestinal tract[1]. it present in the gastrointestinal tracts and person obtains it through a healthy diet that includes fermented foods, dairy products, and foods containing an adequate amount of fiber. These study aimed to investigate the level of nutritional Community awareness of probiotics among non - random sample of adults(N=576 participants) in Misurata city (Libya), was classified on age in to three groups(19-29y, 30-39y, and Over50y) . The statistical methods used were the use of descriptive methods, which is the arithmetic mean for each age group, which represents the percentage of the answer with yes, as well as the use of ONE WAY ANOVA analysis, level of precision (D=0.05), and it was used to compare between different age groups, and the graphical columns were used. SPSS was used to analyze data. results show that there are no significant differences between age groups with the knowledge of beneficial bacterial types (probiotics) despite their conviction of the benefits of these foods for human health, and that the age group from 29-39 years is the most keen to read the nutritional facts on the products. The questionnaire on consumer preferences showed a trend towards healthy foods, especially those containing vital enhancers, and consumer confidence in local products over imported, As for consumers' tendency to use live enhancers in the form of tablets that can be purchased from pharmacies(Biotherapy drugs), consumers have not shown any interest in this option.*

***Keywords*:** Probiotics – Healthy foods – Microbiome - Community awareness – Biotherapy.

I. INTRODUCTION

Probiotics are generally defined as "live microorganisms that when administered in adequate amounts are able to provide benefits to the health of the consumer" (FAO/WHO, 2006)[2]. The more diverse microbiome inside human body, the more it can resist pathogens due to their interactions within the gastrointestinal (GIT)[3]. It has been well demonstrated that probiotics, principally probiotic strains of lactic acid bacteria (LAB), can modulate the human GIT microbiota through inhibiting the growth of opportunistic bacteria [4]. Thus, the stimulation of the growth and activity of probiotic strains in GIT can be considered as a potential approach to control foodborne enteric pathogens[5,6]

Most probiotic products contain bacteria from the genera *Lactobacillus* or *Bifidobacterium*, although other genera, including *Escherichia*, *Enterococcus*, *Bacillus*, *Propionibacterium* and *Saccharomyces* (a *yeast*) have been developed as probiotics. are gut commensals that contribute to the maintenance of gut homeostasis through maintaining a beneficial microbial balance[7]. On the one hand, these bacteria defend against colonization of opportunistic pathogens because of the production of antimicrobial compounds, such as organic acids, hydrogen peroxide (H2O2), ethanol, and bacteriocins[8, 9].Suggesting that probiotics can be a valuable part of a healthy diet. some compelling health benefits have been linked to some strains. These are discussed under Health Effects of Probiotics[10].

Manuscript received October 2, 2020; revised November 05, 2020; accepted November 7, 2020, Published online November 8, 2020

In addition, the emergence of some new public health risks suggests an important role for effective probiotics in the mitigation of some illnesses. For example, the ability of probiotic bacteria to support the immune system could be important to the elderly or other people at risk for contracting common infectious diseases[11]. probiotics are found in many food products, especially fermented foods, the most important of which are yogurt, pickles, fruits, vegetables and others **Table 1**[12].

Studies indicate that the healthy diet and exercise lifestyle contribute greatly to the diversity of the microbiome in the human digestive system, which is reflected in the general health and the ability to resist diseases[19]. Several companies produce probiotics in tablet form, (The FDA regulates probiotics like foods, not like medications. Unlike drug companies, makers of probiotic supplements don not have to show their products if they are safe or that they work. In general, probiotic foods and supplements are thought to be safe for most people, though some people with immune system problems or other serious health conditions should not consume them) [20].

Nutraceuticals are defined as food product that provide therapeutic or physiological benefits beyond the basic nutritional needs and can be used as dietary supplements. They are required to be safe and well tolerate, to exhibit less toxicity and secondary side effects compared to drugs used to treat similar symptoms. Nutraceuticals and released bioactive compounds by probiotics can be used as therapeutic tools to modulate the human microbiota[21]. Education on gut health and probiotics from health professionals may improve probiotic use, especially in populations that are likely to benefit the most, including those with a specific condition or poor lifestyle.

II. MATERIALS AND METHODS

A quantitative-descriptive study was performed using a questionnaire, based on the behaviors and expectations of the consumers along with the consumption attitudes of probiotic food products (especially fermented dairy products). The questionnaire consisted of 15 questions and each question had a number of options for the participants to choose a reply.

1. Data collection:

Questionnaire included a set of questions, including knowing the meaning of probiotics, being keen on eating the foods that contain them, how effective they are in enhancing immunity and preventing diseases, and their importance for people with chronic diseases, and they will buy it, if available in pharmacies. The questionnaires were administered at Misurata,(Libya), Since sample size is directly related to data quality and survey precision, considering a level of precision of D=0.05, a confidence interval of 95% and a proportion of 50%, the final sample size calculated was n=576 participants.

Table 1: Some food products, and their content of probiotics [12]

Product	Organism/s	References
Goat milk	*Bifidobacteriumlongum, Lactobacillus acidophilus*	Tsend-Ayusha and Yoon. 2013 [13]
Yoghurt like products (Laban, Ayran)	*Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus rhamnosus*	Schillinger *et al*., 2004[14]
Yoghurt and freeze dried yoghurt	*Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus rhamnosus, Bifidobacterium spp*	Capela *et al*., 2006[15]
Cheddar Cheese	*Lactobacillus salivarius, Lactobacillus paracasei, Lactobacillus casei.*	Gardiner *et al*.,1998[16] Wang *et al*., 2010 [17]
Fermented Fruits and Vegetables	*Lactobacillus plantarum, L. pentosus, L. brevis, L. acidophilus, L. fermentum, Leuconostoc fallax, and L. mesenteroides.*	Swain., *et al* 2014 [18]

2. Data distribution:

The obtained sample has been divided into three groups according to age, These groups included different ages of adults (19-29y, 30-39y, and Over 50y). Figure (1)

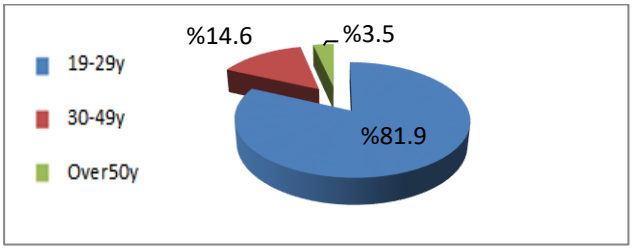

Figure 1: Number of people covered by the questionnaires

In terms of gender, the number of females 502 (81.9%), while the number of males 74 (12.8%) of different ages, out of 576 who participated in the questionnaire. Figure (2)

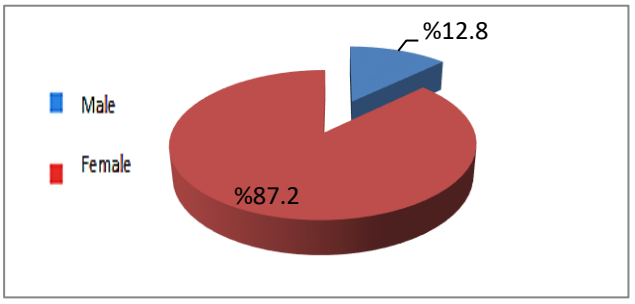

Figure 2: Division the participants in the questionnaire by gender

The educational levels of the participants Diverse from primary to postgraduate. 95% of the participants stated that they do not have any illness and 5% of them were chronic diseases. Figure3

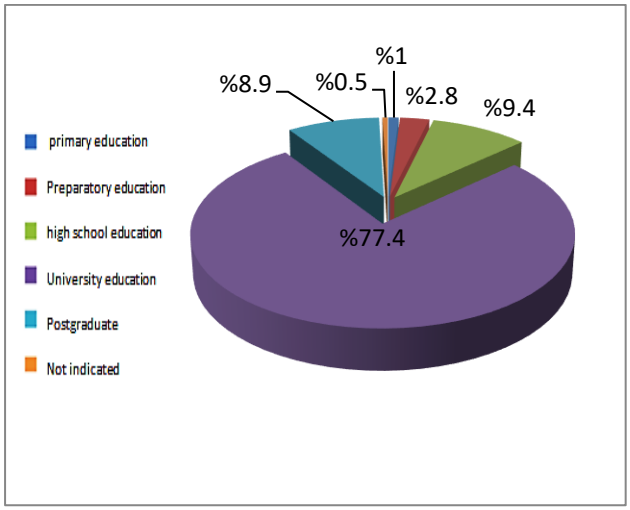

Figure 3: participants by educational level

3. Statistical analysis:

The data were tabulated and graphs were constructed using the Microsoft Excel, version 2010. The mean and One-Way ANOVA analysis were used to understand the influence of the variables on awareness of probiotic foods with the aid of the software SPSS 22.0. According the differences and/or correlations.

III. RESULTS AND DISCUSSION

A. Awareness of healthy nutrition:

When asked a previous acquaintance with the term probiotics, 31% of the second age group(29-39y) had knowledge of it, and the other groups (first and third) showed similar levels 25, 26%, and the p-value was greater than (0.05), indicating that there were no significant differences between the tested Categories, This gives an indication of a lack of healthy food interest among adults regardless of educational levels, Although it nearly 90% of all groups knew of the existence of beneficial bacteria in the food. Figure (4)

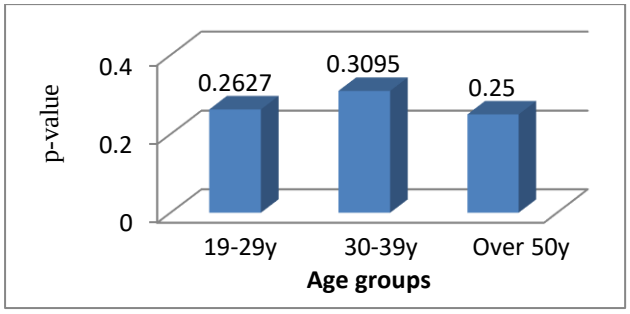

Figure 4: Awareness of healthy food for the participants

In spite of all, there were significant differences between the tested groups when asked about the positive effects of beneficial bacteria on the digestive process. Figure (5)

The results also showed that the second age group (30-49y) is the most interested group for reading the data and food ingredients before purchasing it. Although, there were a significant differences between the three age groups aforementioned however, 68, 68, and 70% of the respondents expressed respectively their support of food consumption that containing beneficial bacteria by people who have chronic diseases such as diabetes, blood pressure, etc..

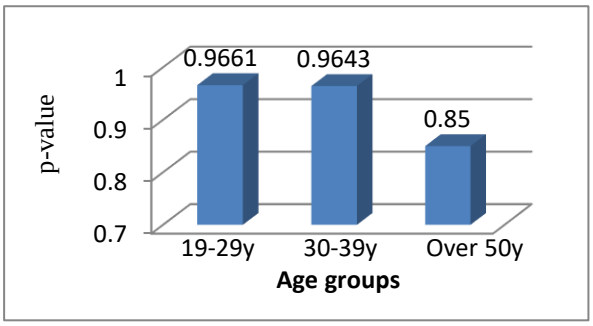

Figure 5: conviction that beneficial bacteria have an effect on digestion

B. Consuming rate of fermented dairy products:

To understand the participants' dietary habits and their eagerness to consume products containing beneficial bacteria (probiotics). Table(2) showed the number of participants who answering (yes) in the all three groups. age group (19-29 years) is 85%, in the age group (from 30 to 49 years) it is 93%, and in the age group (50 years and over) it is 75% and we find that the value The level of significance P-value is greater than 0.05, indicating that there are no significant differences between the three age groups in terms of confidence that dairy products contain beneficial bacteria for the body.

As for the daily consumption of dairy products, we find the answer rate yes to this question in the age group (19-29 years) is 43%, in the age group (from 30 to 49 years) it is 60%, and in the age group (50 years and over) it is 50% We find that the P-value is less than 0.05, indicating the presence of significant differences between the three age groups in terms of concern for consuming fermented dairy products (milk, yogurt) on a daily basis, and the most keen of them are the age group from 30 to 49 years and the least are the age group. (19-29 years old).

When asked about the importance of children getting a daily ration of dairy products, the answer rate was yes to this question in the age group (19-29 years) it is 85%, in the age group (from 30 to 49 years) it is 31% and in the age group (50) It is 90% and we find that the value of the significance level P-value is greater than 0.05, indicating that there are no significant differences between the three age groups and this confirms the absence of significant differences when asked about its importance to the human immune system. **Table 2**

Table 2: Extent age groups are aware of the importance of dairy products.

Questionnaire	Percentage %	Mean	P-value
Confident that dairy products contain beneficial bacteria for the body?	85	.8453	0.056
	93	.9286	
	75	.7500	
Consumes fermented dairy products (milk, yogurt) on a daily basis?	43	.4280	0.016
	60	.5952	
	50	.5000	
believe a healthy diet for children should contain fermented dairy products.?	85	.854	0.845
	31	.857	
	90	.900	
Dairy products are believed to have an important role in boosting the body's immunity?	89	.8898	0.272
	85	.8452	
	80	.8000	
prefer imported dairy products over locally manufactured products?	25	.2479	0.230
	20	.2024	
	10	.1000	

I. Consumer acceptance of probiotic products as medicinal additives(Tablets):

Many companies around the world produce probiotics in (tablets or powders form). that a person can use as an supplement to improving immunity and reducing the effects of chronic diseases such as diabetes, hypertension and stomach ulcers caused by H. pylori bacteria, and sometimes in accelerating the treatment of symptoms of food poisoning, the use of these tablets is not common in Libya, and when we were asked about people's willingness to buy them if they were available in pharmacies, the answer was yes, in the age group (19-29 years) it is 32%, and in the age group (from 30 to 49 years) it is 42% and in the age group (50 years and over) is 25%, and we find that the P-value is greater than 0.05, indicating that there are no significant differences between the three age groups in terms of accepting the purchase if it is provided.

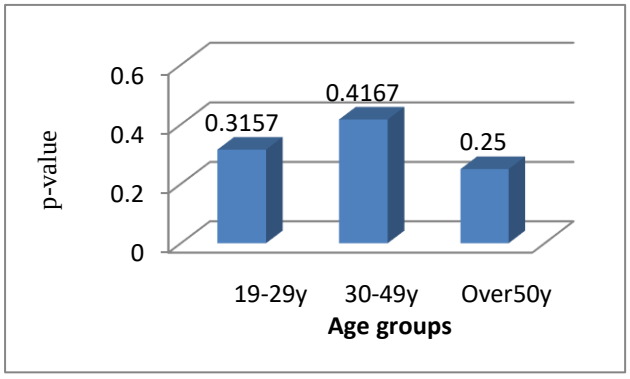

Figure 6: The desire to buy probiotic tablets

IV. CONCLUSION

Through the study, it is evident that the community has decreased awareness of the importance of biological enhancers and their work to enhance the immunity of the human being and their role in reducing the risks of chronic diseases. These probiotics are naturally present in many foods. The participants in the questionnaire did not express a desire to use these probiotics in the form of tablets or powders. It is important to educate consumers about the importance of including these products in their diet or consuming them as ready-made food supplements.

Acknowledgements

We sincerely thank everyone who gave us some of their time and contributed with us in filling out the questionnaires.

REFERENCES

[1] Rubbani, U. and A.J.A.i.L.S. Iqbal, *Evaluation of isolated Lactobacillus strains as Probiotics in yogurt preparation.* 2020. **7**(2): p. 79-85.
[2] Van Doan, H., et al., *Host-associated probiotics: a key factor in sustainable aquaculture.* 2020. **28**(1): p. 16-42.
[3] Guimarães, J.T., et al., *Impact of probiotics and prebiotics on food texture.* 2020. **33**: p. 38-44.
[4] Lau, R., et al., *Transforming Catacombs and the City of Paris: The Spatial Relationship Between the Home for the Living and the Dead*, in *Dynamics of Community Formation*. 2018, Springer. p. 237-248.
[5] Khaneghah, A.M., et al., *Interactions between probiotics and pathogenic microorganisms in hosts and foods: A review.* 2020. **95**: p. 205-218.
[6] Khalesi, S., et al., *Awareness and Attitudes of Gut Health, Probiotics and Prebiotics in Australian Adults.* 2020: p. 1-15.
[7] Gomes, A.C., C. Hoffmann, and J.F.J.E.j.o.n. Mota, *Gut microbiota is associated with adiposity markers and probiotics may impact specific genera.* 2020. **59**(4): p. 1751-1762.
[8] Stedman, A., et al., *Gut commensal bacteria show beneficial properties as wildlife probiotics.* 2020.
[9] Chugh, B. and A.J.C.O.i.F.S. Kamal-Eldin, *Bioactive compounds produced by probiotics in food products.* 2020. **32**: p. 76-82.
[10] Cheng, F.-S., et al., *Probiotic mixture VSL# 3: An overview of basic and clinical studies in chronic diseases.* 2020. **8**(8): p. 1361.
[11] Ashaolu, T.J.J.B. and Pharmacotherapy, *Immune boosting functional foods and their mechanisms: A critical evaluation of probiotics and prebiotics.* 2020. **130**: p. 110625.
[12] Saikia, A., F.J.F.B.F. Dutta, and A.i.H. Health, *Probiotic Foods.* 2019: p. 87.
[13] Tsend-Ayusha, C., Y.-C.J.F. Yoon, and R. materials, *Developing fermented goat milk containing probiotic bacteria.* 2013. **1**(2).

[14] Schillinger, U., C. Guigas, and W.H.J.I.D.J. Holzapfel, *In vitro adherence and other properties of lactobacilli used in probiotic yoghurt-like products.* 2005. **15**(12): p. 1289-1297.

[15] Capela, P., T. Hay, and N.P.J.F.R.I. Shah, *Effect of cryoprotectants, prebiotics and microencapsulation on survival of probiotic organisms in yoghurt and freeze-dried yoghurt.* 2006. **39**(2): p. 203-211.

[16] Gardiner, G., et al., *Development of a probiotic Cheddar Cheese containing human-derived Lactobacillus paracaseiStrains.* 1998. **64**(6): p. 2192-2199.

[17] Wang, H.K., et al., *A new probiotic cheddar cheese with high ACE-inhibitory activity and γ-aminobutyric acid content produced with koumiss-derived Lactobacillus casei Zhang.* 2010. **48**(1): p. 62-70.

[18] Swain, M.R., et al., *Fermented fruits and vegetables of Asia: a potential source of probiotics.* 2014. **2014**.

[19] Rappé, M.S. and S.J.J.A.R.i.M. Giovannoni, *The uncultured microbial majority.* 2003. **57**(1): p. 369-394.

[20] Behera, S.S. and S.K.J.C.O.i.F.S. Panda, *Ethnic and industrial probiotic foods and beverages: efficacy and acceptance.* 2020. **32**: p. 29-36.

[21] López-Moreno, A. and M.J.N. Aguilera, *Probiotics Dietary Supplementation for Modulating Endocrine and Fertility Microbiota Dysbiosis.* 2020. **12**(3): p. 757.

[22] Yilmaz-Ersan, L., et al., *Assessment of socio-demographic factors, health status and the knowledge on probiotic dairy products.* 2020.