


AWARENESS AND KNOWLEDGE OF PEOPLE TOWARDS PROBIOTICS PRODUCTS IN
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ABSTRACT: The aim of this paper is to provide a brief overview of consumer's awareness and knowledge towards products containing probiotic in Punjab region of India using a validated questionnaire and is aimed at filling the research gap between consumer's attitude and perceptions towards probiotic products and marketing strategies of probiotic products. The data was collected with the help of structured questionnaire by simple random sampling. Descriptive statistics was utilized to analyze, conclude and validate the knowledge and attitude of people regarding probiotic products. Percentage and frequency of socio-demographic results were obtained using SPSS. In order to realize relationship between demographic variables and people attitude or knowledge towards probiotic, t-test and Analysis of Variance (ANOVA) was performed. From the data of 220 respondents only 60.5% of respondents were familiar with the word probiotic out of which only 36.8% have ever consumed probiotic. For 81.5% of the respondents who have consumed probiotic, yoghurt is the most favorable probiotic product for consumption. It was also found that there is a significant difference ($p > 0.05$) between both the education level and age group of respondents with the familiarity of probiotic. The present study indicates that although probiotic market has been established but still there is lack of effective marketing strategies and knowledge among consumer attitudes toward probiotic products.

Key words: Probiotic, consumer attitude, live microorganisms.

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INTRODUCTION

Probiotics a new entry in the market of functional foods has been defined by various organizations in various ways. According to FAO/WHO, 2002 "Probiotics are living microorganisms which when administered in adequate amounts confer health benefits to the host". The Natural Health Products (NHP) Regulations define a probiotic as a monoculture or mixed culture of live micro-organisms that benefit the microbiota indigenous to humans. The property of probiotics showing relation between nutrition and health with negligible side effect keeps it on upper hand among all functional foods. With change in era of lifestyle people have become more health conscious thus leading to extension of probiotics market (Vidigal et al., 2011). Attitude of consumer towards a product can be divided into three components: the cognitive component which defines the beliefs of consumer towards a product, Affective component which defines the feelings or emotions of consumer towards the product obtained from effective experience and the cognitive component defines the probability that the individual will behave in a specific way (Schiffman and Kanuk, 2009). Thus attitude of today's consumer towards a product is affected not only by sensory properties but is overlapped by its health properties and knowledge of functional ingredients of the products (Jaeger, 2006).

Although status of probiotics is still not clear in health industry as they have applications both as preventive as well as curative therapy, for instance probiotics are available in various varieties in the market such as Functional food & beverages (dairy products, non-dairy beverages, breakfast cereal, baked foods, fermented meat products, dry-food probiotics), dietary supplements (food supplements and nutritional supplements), Specialty nutrients (infant formulation), pharmaceutical preparations and as Animal feed.

Thus to create a stronger market of probiotics it is required to strengthen the positive attitude of consumers towards the products containing probiotics, which can only be attained if the people understands the benefits of the product on their health (Ares and Gambaro, 2007; Grunert et al., 2007; Verbeke, 2005). Investigation of knowledge, thoughts, beliefs, behavior and feelings of people can help to determine the current status of products containing probiotics and the pace of market development of probiotics products in a certain region.

Present Status of Probiotics in India

In India food industry is the main hot spot for investors. Among all the forms of Probiotics demand for Probiotics foods has gained much popularity in Indian population. Although at global level, Indian probiotic industry still is at its infancy stage as it accounts for less than 1% of total world market turnover. However, it has been emerging as an attractive option for global players in this market segment because India is one of the largest producers of milk and having world's highest cattle population (Probiotic Association of India). In Indian market probiotics are mainly available in form of functional foods and drugs. Indian probiotic market was valued at \$2 million as per 2010 estimates. According to figures released by US-based research firm, Frost and Sullivan, in August 2012, probiotic products in India generated revenue of US \$310 million in 2011. The nascent domestic probiotic market has been expected to reach to an estimate of 20.6 million with a projected annual growth rate of 22.6 per cent according to a research firm, Frost & Sullivan. The market value supposed to increase up to US \$522.8 million by 2018. Currently Milk and fermented milk products have 62% of the market share in probiotic products (Indian Consumer Survey, 2010). Among the functional foods probiotic yoghurt takes in 50% share followed by probiotic ice cream and probiotic drink.

Currently drugs have not been included in Pharmacopoeia and are kept under proprietary medicines and should fulfill the standards as per Schedule V of Drugs and Cosmetics Rules 1945 (Frost & Sullivan, 2009). On other hand probiotic food, are regulated by a set of food laws that aim to regulate general food items as defined by the recently established Food Safety and Standards Authority of India (FSSAI). The Indian Council of Medical Research and Department of Biotechnology have formulated guidelines for probiotics being marketed as foods specifying the criteria for launching any probiotic product in market. These guidelines also specify the labeling requirements for probiotic products in India (Ganguly et al., 2011).

Current Players in Indian Probiotic Market

Among the two forms India acts as major station for functional food form of probiotics over drugs. Commonly available brands that exist in India include Nestle, Amul, Yakult Danone and Mother Dairy along with other minor players operating in different regions in their own capacities. Among these brands Amul has emerged as a leader with nearly 70% market share in 2011 with Nestle and Mother Dairy holding second and third position in the Indian Probiotic Market respectively. In February 2007, Amul firstly came out with the probiotics ice cream profile at national level, further followed by probiotic lassi (Butter milk). The probiotic factor added up to 10% to the ice cream sale and about 25% to the Dahi (Curd) sales. Second in the run Mother dairy having largest milk plants in Asia came out with various probiotic products like b-Activ Probiotic Dahi, b-Activ Probiotic Lassi, b- Activ Curd and Nutrifit (Strawberry and Mango). Among the probiotics drink sales Yakult is ahead of other brands. Emerging in the Indian probiotics market is the Yakult Danone India Pvt Ltd (YDIPL) a joint venture between Japan's Yakult Honsha and The French- Danone Group and is offering Yakult, a probiotic drink made from fermented milk, *Lactobacillus* and some sugar (Amagase., 2008).

Second form of probiotics making its space in Indian probiotic market is probiotics in form of drugs. Major players in the probiotics drug market in India include companies like Ranbaxy (Binifit), Dr. Reddy's Laboratories, which has four probiotic brands, Zydus Cadila, Unichem, JB Chem, and Glaxo SmithKline. Although probiotic drugs acts as a path to cure a problem and probiotics food as a path to prevention from problem still probiotics in the form of drugs are widely accepted whereas probiotic foods are still viewed with doubts and confusion. But the speed of acceptance level is very slow among Indian consumers (Arora et al., 2013).

Favorable factors for probiotics market establishment

With change in era of lifestyle and growth of Indian economy Indian middle class and upper class population has become more self medicated and has started to hold the preventative road to live a healthy life (Sloan, 1998). Increase in literacy rate of Indian population has forced the Indian to dismiss the formula of spending money for post disease conditions out of compulsion and follow the formula of healthy living by moving to preventive therapies (Childs, 1997). Increase in Per capita income has further led to increase in investment in healthcare creating the scenario for an inclusive growth of Indian probiotic market (Hilliam, 1998).

Another factor that favors Indian probiotic market includes the increasing competition in pharma retail. With increase in competition pharma companies comes forward with new and diversified products with new focus on bringing preventive therapies leading to entry of probiotics with different formulations in market.

Another factor which contributed to entry of probiotic market in India is the increase in aging population. According to Indian Bureau of Statistics, 2008, by the end of the decade 18% increase in people above 60 years category year has been estimated (Gilbert, 1995).

MATERIALS AND METHODS

Structured questionnaire with exploratory characteristics were used on the socio-demographic profile of the consumers, consumption and awareness with respect to products containing probiotics a quantitative-descriptive study was performed. The questions were based on knowledge of common people about the products containing probiotics, their attitude towards probiotic containing food and the level of consumption and thus the market of probiotics in Punjab region. The questionnaires were prepared and administered at Chandigarh Group of Colleges, Mohali between the months of February and June 2015 with previous consent of the respondents.

A final survey questionnaire containing open ended and multiple choice questions with total 22 items of which 12 items for people consuming probiotics and 6 items for people not consuming probiotics was applied to a total of 350 individuals using random techniques of which a total of 220 individuals. The survey included questions about the knowledge and familiarization to the word probiotics, awareness about the health effects of probiotics, consumption frequencies of the probiotic products and reasons for non-consumption of probiotics providing the idea of attitude of people regarding probiotics products and also helps in accessing the acceptance and frequency of consumption of probiotics products. Descriptive statistics was utilized to analyze the profile of the respondent. Descriptive statistics was utilized in order to summarize the sample and measures.

Simple random sampling (SRS) was utilized to conclude and validate the knowledge and awareness of people regarding food products containing probiotics. A simple random sample is meant to be an unbiased representation of a group. SRS is a type of probability sampling technique. With the simple random sample, there is an equal chance (probability) of selecting each unit from the population being studied when creating the sample. Percentage and frequency of socio-demographic results were obtained using SPSS. Further t-test and ANOVA was performed to identify the relationship between people attitude or knowledge towards probiotics and demographic variables. For t-test and ANOVA the significance and non significance was made based on null hypothesis that there is no significant difference between people attitude or knowledge towards probiotics and demographic variables if $p < 0.05$.

RESULTS AND DISCUSSION

Sample profile

From the data retrieved by the survey, a randomly distributed population was obtained as respondents (Table 1). Of the 220 individuals who answered the final questionnaire 30.5% were men and 69.5% women, with maximum respondents lying in age group of 24 years or less and maximum of the respondents were post graduates. All the respondents included in the survey were residing in the Punjab region.

Test Statistics

Among the sample size of 220 about 60.5 % of population was familiar with the word probiotics i.e. 133 respondents were familiar accounting for a good familiarity with probiotics. But only 36.8% of total respondents (N=220) had ever consumed probiotics bringing down the sample size (N) to 81. And taking into consideration about definition or knowledge about probiotics i.e. probiotics are live microorganisms, which in adequate quantities provide health benefits to the consumer 92.6% of total population consuming probiotics (N=81) agreed with the definition, providing the conclusion that most people consuming probiotics have knowledge about probiotics.

Respondents were also asked to determine how they heard about probiotics. Through the survey advertisement was found to be the most common source of providing information about probiotics to the respondents as shown in Table 2:

Table1:- Demographics of respondents (N=220)

Demographic variables	Total (n)	Percentage
Gender		
Male	67	30.5%
Female	153	69.5%
Age range		
24 or less	167	75.9%
25-34	35	15.9%
35-44	13	5.9%
45-54	5	2.3%
Highest Level of Education		
High School and below	6	2.7%
Senior Secondary	24	10.9%
Bachelor's Degree	74	33.6%
Master's Degree	89	40.5%
Doctorate or Professional	27	12.3%
No of people in Household		
1	1	.5%
2	4	1.8%
3	21	9.5%
4	86	39.1%
5	48	21.8%
6	29	13.2%
More Than 6	31	14.1%

Table 2:- Frequency and percentage values of respondents for the question: “How they heard about probiotics?”

Source	Frequency	Percentage (%)
Doctor	11	13.6
Pharmacist	7	8.6
Family Member	6	7.4
Friend	17	21
Internet	45	55.6
Advertisement	139	63.2
Book	26	32.1
Pamphlet/newspaper	13	16

Among the respondents who had heard about probiotics, the respondents were asked about the probiotics manufacturing companies they had heard with Yakult topping the chart with 75.3% over Amul and Nestle. Consumers of probiotics were also asked for the form of probiotic product they consumed. The results showed yoghurt (81.5%) as the most favorable consumption form of probiotics products as shown in Table 3:

Table 3:- Frequency and percentage values of responds for the question: “Which form of probiotics do you consume?”

Consumable forms of Probiotics	Frequency	Percentage (%)
Yoghurt	66	81.5
Capsules	6	7.4
Nutrition	8	9.9
Fruit Drinks	16	19.8
Other	8	9.9

The survey questionnaire also included the question about the consumption frequency of participants with maximum percentage of respondents (66.7%) who are familiar to probiotics only consume probiotics sometimes and only 30.9% of respondents consumed probiotics daily (with 15.5 % respondents consuming it as food and 11.4% as supplements). Also through the survey maximum percentage i.e. 61.7% of the consumers of probiotic products liked the taste of probiotic products and 96.3% of the consumers didn't found any side effects of consuming probiotics and found probiotic consumption as safe for consumption. Moreover 91.4 % of the probiotic consumers would also recommend probiotics to others showing that the consumers of the probiotics are highly satisfied with the product and its health benefits. Also 86.4% of the respondents found the probiotics products affordable. Reasons of respondents for not consuming functional foods were also investigated in the survey. Among all the reasons the maximum percentage of respondents (40.5%) gave the reason that they are "not aware of the word probiotics" as shown in Table 4. However on asking about whether these respondents wanted to know about the probiotics 84.9% of the respondents were interested in knowing about the probiotics. Percentage and frequency of socio-demographic results were obtained using SPSS. In order to realize relationship between demographic variables and peoples attitude or knowledge towards probiotics t-test and Analysis of Variance (ANOVA) test were performed. To check relationship between gender and attitude of people toward probiotics, independent t-test was performed between parameters as shown in Table 5.

Table 4:- Frequency and percent % values of reasons for not consuming probiotics (N=139).

Reasons	Frequency	Percentage
Not affordable	2	1.4
Not aware of the benefits of probiotics	10	7.2
Not aware of the word probiotics	89	64
Felt no need of taking it	26	18.7
Any other	12	8.6

Using t-test the relationship among the demographic variables (male and female) and familiarization with word "probiotics", knowledge about probiotics, consumption level and taste of probiotics and reasons for not consuming probiotics was compared. Based on above data null hypothesis (H_0) were designed as there is no difference between group statistics and alternative hypothesis (H_1) as there is significant difference between group statistics. According to t-test, there is significant difference in gender and awareness and familiarization for probiotics in terms of familiarity with the word probiotics and how often they consume probiotics since $p < 0.05$. Hence null hypotheses were accepted in these cases. In rest of the cases no significant difference was observed in gender and awareness and familiarization for probiotics in terms of definition of probiotics, taste of probiotics and reasons for not consuming porobiotics since $p > 0.05$, hence null hypothesis was rejected for these cases. The observed values for independent t-test are shown in Table 5.

Table 5:- Independent-samples t-test results for comparison of gender and awareness and familiarization for probiotics

Questions	Groups	n	Mean	Standard Deviation	Standard Error Mean	t-test Results		
						df	t	p
How familiar are you with the word Probiotics	Male	67	2.76	1.280	.156	218	0.093	0.012
	Female	153	2.75	1.127	.091			
Probiotics are live microorganisms, which in adequate quantities provide health benefits to the consumer	Male	21	1.05	.218	.048	79	-0.635	0.195
	Female	60	1.10	.354	.046			
How often do you eat products containing probiotics	Male	21	1.81	.402	.088	79	0.984	0.006
	Female	60	1.68	.537	.069			
How did you found the taste of probiotics product you consume	Male	21	1.33	.577	.126	79	0.966	0.206
	Female	60	1.48	.624	.081			
Reasons for not consuming probiotics	Male	46	3.17	.851	.126	137	0.911	0.761
	Female	93	3.30	.734	.076			

df, degree of freedom; t, t value; p, significance

For comparing more than two groups like relationship between demographic variable (like age group and educational level) and people awareness or familiarization another statistical tool ANOVA was utilized. Two null hypotheses were designed:

For comparison between Education level and familiarity about probiotics:

Null Hypotheses (H₀): There is no significant difference between education level and familiarization with the word probiotics.

Alternative hypotheses (H₁): There is a significant difference between education level and familiarization with the word probiotics.

Data in table 6 indicate that there is significant difference reported between education level and familiarity about word probiotics. Hence the null hypothesis was rejected.

For comparison between Age groups and familiarity about probiotics:

Null Hypotheses (H₀): There is no significant difference between Age groups and familiarization with the word probiotics.

Alternative hypotheses (H₁): There is a significant difference between age groups and familiarization with the word probiotics.

According to data in Table 6 indicate that there is significant difference reported between age groups and familiarity about word probiotics. Hence the null hypothesis was rejected.

Table 6-: One-way ANOVA results for comparison of educational level and age group with familiarization and awareness of probiotics.

ANOVA Results								
	Groups	n	VS	SS	df	MS	F	Sig.
Education level	Doctorate or Professional	27	Between Groups	21.067	4	5.267	4.041	.004
	Master's Degree	89	Within Groups	280.183	215	1.303		
	Bachelor's Degree	74	Total	301.250	219			
	Senior Secondary	24						
	High School and below	6						
Age group	45-54	5	Between Groups	34.057	3	11.352	9.177	.000
	35-44	13	Within Groups	267.193	216	1.237		
	25-34	35	Total	301.250	219			
	24 or less	167						

SD: standard deviation; VS: variance source; SS: sum of squares; df: degree of freedom; MS: mean of squares; F: F value; p: significance

CONCLUSION

With time the developing country India has welcomed the probiotics market with open hands due to various factors ranging from growth of economy to shift of Indian mentality towards preventive therapies to increase in ageing population of India and many others.

But these all points had only helped the probiotic market establishment in the country. Through the survey in one of the rich state of country i.e. Punjab, well known state for its health and wealth, the statistical results were not favorable for probiotics market. Only 19.5% of the population was extremely familiar to the word probiotics and 25.5% had just heard of the word probiotics with maximum percentage 39.5% being not familiar to the word probiotics. And the main reason found to be behind this was lack of knowledge and effective marketing strategies among common people of the region about probiotics.

Therefore, through the survey results we can conclude that there is a great loophole between the manufacturing companies and the consumers with respect to probiotics. The manufacturing companies are not able to present and advertise the role of probiotic food products in daily life of consumers. The companies had to bring the marketing strategies by combining the doctors/scientific approach to the consumers to make the consumers know about the health benefits of probiotics. Legal hole in the functional food sector has been found to be one other hurdle in development of probiotics market. Laws about health claims are also required to be reformed because they are not sufficient to explain the health benefits of probiotics products (Bilgic and Yuksel, 2012).

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