

**AWARENESS, KNOWLEDGE AND INTEREST OF PREBIOTICS AND
PROBIOTICS TOWARDS END USERS IN INDIA**

Dissertation Submitted by

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in

Pharmaceutical Management

DECLARATION BY STUDENT

I hereby state that this dissertation titled “AWARENESS, KNOWLEDGE AND INTEREST OF PREBIOTICS AND PROBIOTICS TOWARDS END USERS IN INDIA” is the bonafide note of my fundamental researchwork. I proclaim that it has not been submitted to another university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

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CERTIFICATE

This is to certify that Pranjal Singh in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur has successfully completed his internship at IIHMR university during February 20, 2023 - May 19, 2023.

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This is to certify that dissertation and internship titled “AWARENESS, KNOWLEDGE AND INTEREST OF PREBIOTICS AND PROBIOTICS TOWARDS END USERS IN INDIA” is a record of the research work undertaken by Pranjali Singh in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management)/MBA (Pharmaceutical Management)/MBA (Development Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

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Abstract

Probiotic is important microbial dietary supplement which will benefit the host with its effect in the GIT. The probiotics are broadly used to make fermented diet dairy product like yogurt or freeze-dried products . With the upcoming potential , it is possibility to find them in vegetables that are fermented and meats. There are various physical condition which are related with the consumption of probiotics, involving improvement of lactose intolerance and development of immunity, is also reported in the findings. There are various evidences that suggest the role of probiotic in decreasing the rotavirus risk which is induced diarrhoea and colon cancer. ⁽¹⁾

On the other hand , the prebiotics are the non-digestible food materials which benefits the host by accelerating the development or activity of one or less number of bacteria in the colon. The relationship of prebiotics with human health is an increasing area of interest in the past few years. They also consume the microbiota, and their mortification outcomes are short chain fatty acid which in return freed into the blood stream, subsequently, influencing the gut tracts as well as other different organs. The galactose oligosaccharides and Fructo- oligosaccharides are two crucial classes of prebiotics with essential advantages on person wellbeing. ⁽²⁾

The aim of the existing literature is to approach knowledge and awareness of probiotics amongst citizens of India.

Keywords- Digestion, dietary supplements , intestinal microbiota , fermentation.

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Chapter 1

Introduction

Understanding and concern in prebiotics and probiotics have been gradually rising in India over the years. This is mostly because of the increasing perception of the essentials of gut health and its effect on total well-being. Prebiotics are non-digestible fibres which usually serve as food for helpful microbes in the gut, while probiotics are live bacteria or yeasts that will offer health advantages when used.

Different findings have highlighted the possible advantages of probiotics and prebiotics like , bettering digestion, increasing as well as improving immune function , also lessening the danger of several diseases and enhancing total gut health. This has led to increased among individuals seeking natural ways to improve their overall health.

In India, some traditional fermented food products such as yogurt, buttermilk and pickles have long been an important part of culinary culture. These foods naturally contain probiotics and their consumption has been prevalent for generations. However with the increasing significance and awareness in health and wellness there has been an incline in the usage of commercial probiotics products as probiotic yoghurts, drinks and supplements.

There has been a progressive incline in the healthcare and wellness sector from past few years , the Indian population have been accepting the usage of natural source of probiotic food like yoghurts , also the supplements.

Numerous Indian companies have participated the market with their own prebiotic and probiotic products, exploiting on the increasing demand. Wide range has been offered by health food stores, pharmacies, and online platforms by prebiotic and probiotic products to organize the wants of users.

With the increasing understanding and curiosity in prebiotics and probiotics are accelerating, To note that there may still be changes in knowledge and understanding among the basic human population is significant. Quite individuals may have a better knowing of the concept and positively pursue out these products, whereas others might have limited expertise or be less familiar with the terminology.

With staying up to date with the recent articles and paper research on this topic in India, I commend directing a search on honest academic databases, scientific journals, or online platforms which will

deliver access to scientific literature, such as PubMed, Google Scholar, or Indian Journal of Medical Research. These particular sources might benefit you with the most latest and thorough information on the awareness, knowledge, and interest in prebiotics and probiotics among end-users in India.

The digestion and the absorption of the food particles is responsible by the gut system which is quite named as the digestive system or gastrointestinal system, whereas adding to the elimination of waste elements of body to outside of our excretory system, which is a complex system that would include specific body organs and processes with working in harmonisation to breakdown the taken meal and extract vital nutrients and excrete the waste and unabsorbed products via excretion. ⁽³⁾

As the gut system aids the digestion and absorption of important nutrients , along with that it also plays a very crucial role in the immunity , hormonal regulation add neurological health, therefore the gut system is very essential part of our body. In order to balance a well healthy gut along with perfectly balanced diet , one need to assess the key to systematic exercise and plenty hydration in order to maintain the overall wellbeing.

Digestion and Nutrient Absorption-In order to maintain a healthy gut one must follow appropriate digestion and efficient absorption of nutrients from the meal one consumes. Further the complex molecules from the food we eat are broken down by the gut into very minute particles, by using the help of digestive enzymes, further allowing the body 2 extract important nutrients such as minerals vitamins also energy.

Immune Function: The gut is a central hub for immune activity. It houses a large portion of the body's immune cells and acts as a barrier against harmful pathogens. A healthy gut microbiota, composed of beneficial bacteria, helps regulate immune responses and defends against infections. It supports the advancement and maintenance of a strong immunity .

The Gut health is very directly bound to the use of probiotics and prebiotics, because these particular substances might have an important roll on the working of the gut microbiota.

Here are the importance of gut health in terms of prebiotics and probiotics:

Prebiotics boost a strong Gut Microbiota:

The non digestible fibre which serve as food for important bacteria in the gut are the pre biotics. The prebiotics precisely encourage the overall growth and activity of important bacteria called as bifidobacteria and lactobacilli, whereas inhibiting or stopping the growth of dangerous bacteria. By

the intake of pre biotics, one carefully support the overall growth of a healthy and diverse gut microbiota, that is very crucial for the health of gut and also for the overall wellbeing.

Probiotics Improve the Gut Microbial Balance:

Probiotics are live bacteria or yeasts that, when consumed, provide health benefits. They can help restore and maintain a healthy gut microbiota by introducing beneficial strains of bacteria.

Probiotics provides with the benefit of boost in the digestion and ameliorate the immune system , The probiotic aid in decreasing the specific threat that might include gastrointestinal circumstances like

1) Irritable bowel syndrome , 2)Diarrhoea

3) Inflammatory bowel disease

Refinement of the digestion and the enhancement of the soaking up of nutrients both (the prebiotics and probiotics) tasks in a reciprocal mode.

Prebiotic reinforces to elevate the growth of major bacteria that helps in breaking down of fibres and complex carbohydrates which results in boosting the smooth process of digestive system.

Lastly, it performs an important part to the breakdown of definite vital nutrients and generate enzyme which will aid in the overall digestion, also permitting it for the refine absorption of essential minerals and vitamins and other nutrients which are crucial for the human body.

Immune System Support:. The well-balanced gut microbiota is very fundamental for the regular immune function, also microbiota shows crucial task in controlling the responses of the immune function.

In contemplation to regulate the immune system , the prebiotics and probiotics tasks in reciprocal manner for enhancing the advance of vital bacteria with more distant supporting the construction of immune modulating properties.

This can enhance the body's defence against pathogens and help regulate immune-related conditions.

Gut-Brain Axis & Mental Health: The gut microbiota transmits with the brain through the gut-brain axis,& approaching investigation indicates that this communication may exert influence on mental health. Prebiotics & probiotics can definitely impact the gut-brain axis, capacity of improving mood,

reduction in depression, anxiety and enhancing cognitive function. They regulate in maintaining stress level, whereas the microbiota acts a very significant part in the body's stress response.

Depletion of Gastrointestinal Disorders: Prebiotics and probiotics indicates favourable results in controlling various gastrointestinal disorders. For instance, probiotics have been establish to be advantageous in reducing symptoms of diarrhoea, IBS, and IBD. Prebiotics, on contrary ,can aid alleviate constipation by encouraging smooth bowel movements and enhancing faeces consistency.

It is vital to jot down that individual responses to prebiotics and probiotics may differ, and their productivity can pivot on components like the specific strains or varieties of prebiotics and probiotics used, dosage, and an individual's unique gut microbiota. If studying probiotic and prebiotics supplementation, it is asked to seek advice with a healthcare specialist or a registered dietitian who can pass out customized direction as per your particular requirements and health problems.

Finally, since the pandemic of COVID-19,the users' have gained keen interest around the globe for prebiotics and probiotics, also the graph of the interest of this has been increasing exponentially. ⁽⁴⁾

Assuming the increasing interest in this kind of area, aim of the current article is to look over the existing scenario of prebiotics study in India and discover the cognizance and familiarity on the matter between Indian users and how socio-demographic features impact the behaviour of users with respect to the dietary choices .

This investigation could clearly aid the attracted stakeholders to focus on the population wants and desire involving food presentations with claimed effects.

Chapter 2

Review of Literature

(1) Knowledge and consumption of probiotics and prebiotics in India: a narrative review

This narrative review has discussed the current work on the learning, usage, and features affecting the intake of probiotics and prebiotics in India. It has inspected the present nature of the probiotics and prebiotics market in India, to which the conclusion came to a perception that not many people were well aware about the prebiotics and probiotics, also the knowledge and awareness of the probiotics are increasing exponentially, only the young generation had a detailed awareness and education about the both probiotics and prebiotics in India.

The observational studies that have performed till recent date have a very small sample size and high number of younger participants and people belonging to middle or high income households. The studies with even larger sample size focuses on the participants from the rural and urban areas can clearly give a picture for this topic. The people has also forgotten the traditional foods that contain probiotics and prebiotics in the natural state, therefore the population must be aware about the natural sources of prebiotics and probiotics via different awareness programmes and social events that will in return benefit the food beyond gastrointestinal health. ⁽⁵⁾

(2) Assessment of Knowledge and Awareness of Probiotics Among the Dental Post-Graduate Students- A Questionnaire Study

The aim of this particular research paper was to access the recognition and information of the prebiotics and probiotics and the audience was post graduate dental students.

The sample set was 104 dental post graduate students belonging from Maharashtra state. A survey was float among them, in which first second and 3rd year students were included. Devar asked perfectly structured and administered 14 questions in the survey .

Statistical Analysis Used:

Microsoft Excel 2010 was used for the data entry, analyzation of results was done using SPSS version 21 software , also the detailed statistics like frequencies and percentage share work calculated, Pearson chi square test was used to check out the difference between responses and study subjects.

Conclusion of this particular study ended at a fine level of knowledge and awareness amongst postgraduate dental students. The sample set work mostly were alert about the important advantages of probiotics on the health when it comes to digestion of food and maintaining the immunity. But On the contrary the population might still lack the rest of the benefits of probiotics. It was seen that awareness and clarity about the term prebiotic was still too less. ⁽⁶⁾

(3) Professionals' Knowledge of Probiotics: An International Survey

According to the literature paper a survey was conducted for the health specialists to examine their awareness and expertise regarding the probiotics. To perform the investigation and online survey was done to collect the records on the expertise of health specialists which was floated via email and social media platforms with the use of snowball sampling.

It was seen that the health professionals had moderate level of knowledge and awareness of the probiotics, this scenario might be enhanced by the application of different understanding programmes. As probiotics contain tons of benefits in the health subjects, health experts should finally gain the habit of probiotic use in their lab practices .

The majority of the respondent (86.8%) had previously consumed probiotics. More than 92% of the pharmacist also the health specialists also had consumed probiotics, following different medical experts (89.3%). Greater than 82% of the doctors and dentists had used probiotics , as had 80% of nurses, midwives and psychologist. ⁽⁷⁾

(4) Correlation of Knowledge, Attitude, and Practice Toward Probiotics for the Digestive System Among Health Science Students

The aim of this article paper was to gain the learning approach and practice of the probiotic of health Science students in university of Indonesia.

Cross sectional study was held on pharmacy midwifery health and nursing students in 2020. To select the study subjects, proportional cluster random sampling was done, also an online survey were conducted in order to accumulate the records. Finally , the records was transferred to statistics software for analyzation.

Majority of the respondents had a moderate expertise also optimistic outlook and habit towards probiotics. ⁽⁸⁾

(5) Awareness, Knowledge, and Interest about Prebiotics—A Study among Romanian Consumers

The aim of the literature was to examine the users behaviour as well as the perception to evaluate the expertise on the perception of prebiotic in Romania. The audience attraction point was measured by the use of Google trends, and also research was done via questionnaire. Analyzation of the collected data was done by the help of SPSS program, and cross tabulation was also handled in order to check the impact of socio demographic properties on selection of diet and perception of prebiotics. 303% in complete worthy sample set. ⁽⁹⁾

The emphasis of the study is such as the residents of Romanian users that represents the youth and grownup population, highest population was of women that is 76% and highly educated , they were overally aware with the idea of prebiotics and various health results. Though, it perceived misunderstanding within several groups relating the idea's denotation , which would be because of absence of communal consensus and terminology leading to this Top Rank midst the related stakeholders, that will result in distortion and also the misperception within customers . ⁽⁴⁾

Chapter 3

Methodology

3.1 RESEARCH QUESTION

Statement that poses an inquiry or curiosity about a specific phenomenon, event, or concept that needs to be investigated. It is the foundation upon which a research study is built and helps to define the scope and purposes of the study.

- 1) To discover the awareness of the population regarding prebiotics and probiotics.
- 2) To find out the consumption rate of the population regarding prebiotics and probiotics.

3.2 OBJECTIVE

- 1) To recognise the knowledge of the Indian population towards the details of prebiotics and probiotics.
- 2) To look out whether the audience is well aware about the food types that is natural sources of prebiotics and probiotics,
- 3) To find out what amount of the audience uses prebiotics and probiotics in their daily lifestyle.

3.3 ONLINE SURVEY

3.3.1 Participants

Participants living in India was questioned to namelessly fill out an online questionnaire relating to the knowledge, use, and perception of prebiotics and probiotics.

The online questionnaire was in the format of google form. Records were gathered between April and May 2023. Members were arranged as young users (15–24 years old) and adults (25–64 years old).

3.3.2 Survey Design

As a survey method, two-part form was constructed which comprised of 16 questions, and in cooperation of close-ended and open-ended questions. The form's submission time stretched between 3 to 5 min, and applicants responded the Indian style of the questionnaire.

3.3.3 Questionnaire Instrument

Closed-ended , dichotomous, and open-ended questions were all included in the survey. The first section required demographic data, including gender, and degree of education The second section asked about the knowledge and awareness about the prebiotic and probiotic definitions . Also further part of question including the benefits of using prebiotics and probiotics supplements. After section of the questionnaire included about the knowledge and awareness among the crowd of the type of food including prebiotics and probiotics to be used in daily lifestyle of an average Indian citizen. The options included Yogurt ,White bread ,Chicken breast ,Orange juice.

Proceeding with the questionnaire , detailed information were tested by the question How do prebiotics differ from probiotics? To which several various answers were given for choices that included –

- Prebiotics are live microorganisms, while probiotics are non-digestible fibres.
- Prebiotics are non-digestible fibres, while probiotics are live microorganisms.
- Prebiotics and probiotics are different terms for the same thing.
- Prebiotics and probiotics are unrelated to each other

This particular question the google form was to check whether the population of India had a wider view towards the difference between the prebiotics and probiotics.

Further on the questionnaire took detailed step towards the audience awareness about the subject by asking about the name of organization that coined the term "prebiotic".

Going on finally to assess the consumers' perception, the survey included certain options given about several conditions in which they feel prebiotics and probiotics are most beneficial, the options were Allergies , Constipation , Heart health , Diarrhoea ,Overweight/Obesity, Immune health.

Chapter 4

RESULT / DISCUSSION

4.1) Demographics

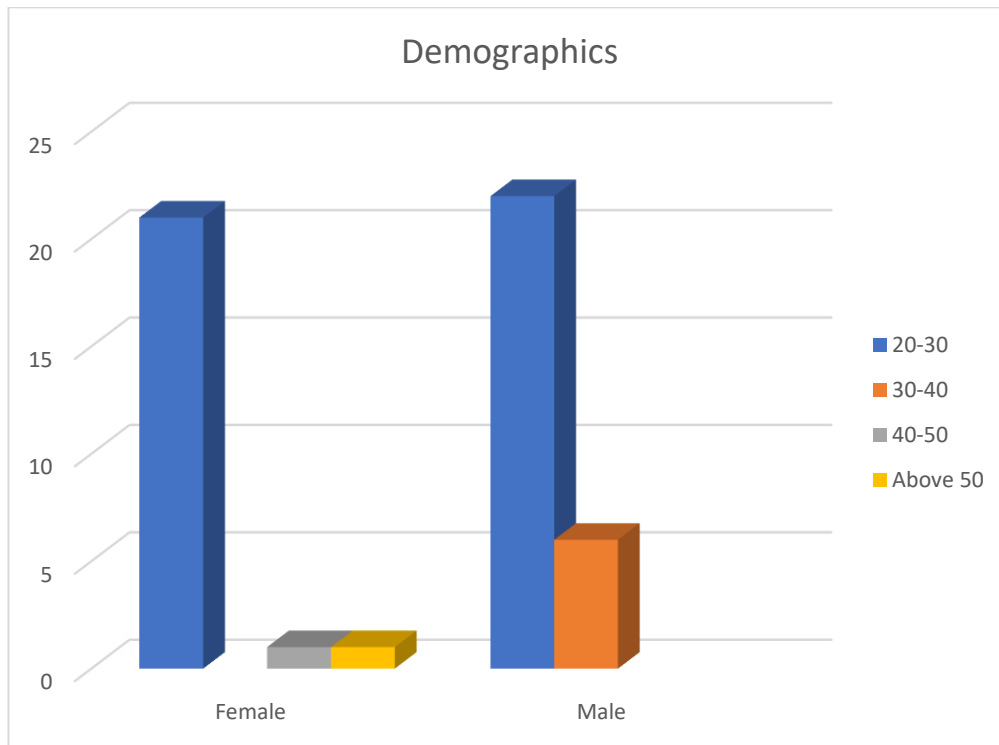


Figure 4.1

The above are the demographics of our audience, the sample set of our audience was 51 including 28 male and 23 female, in which the maximum age group was 20-30 years i.e., 21 from age group 20-30 female and 22 from male.

The audience was too less from the other age groups i.e., 30-40, 40-50, and 50 above.

There were no audience from the age group 30 to 40 female and one female from the age group 40 to 50 years, finally one female from age group above 50.

From the male audience there were 6 males from the age group 30 to 40 years and no audience from the age group 40 and above.

So, the majority of our audience was from the age group 20 to 30 that is college going as well as employee crowd.

4.2) Natural Source of Probiotics

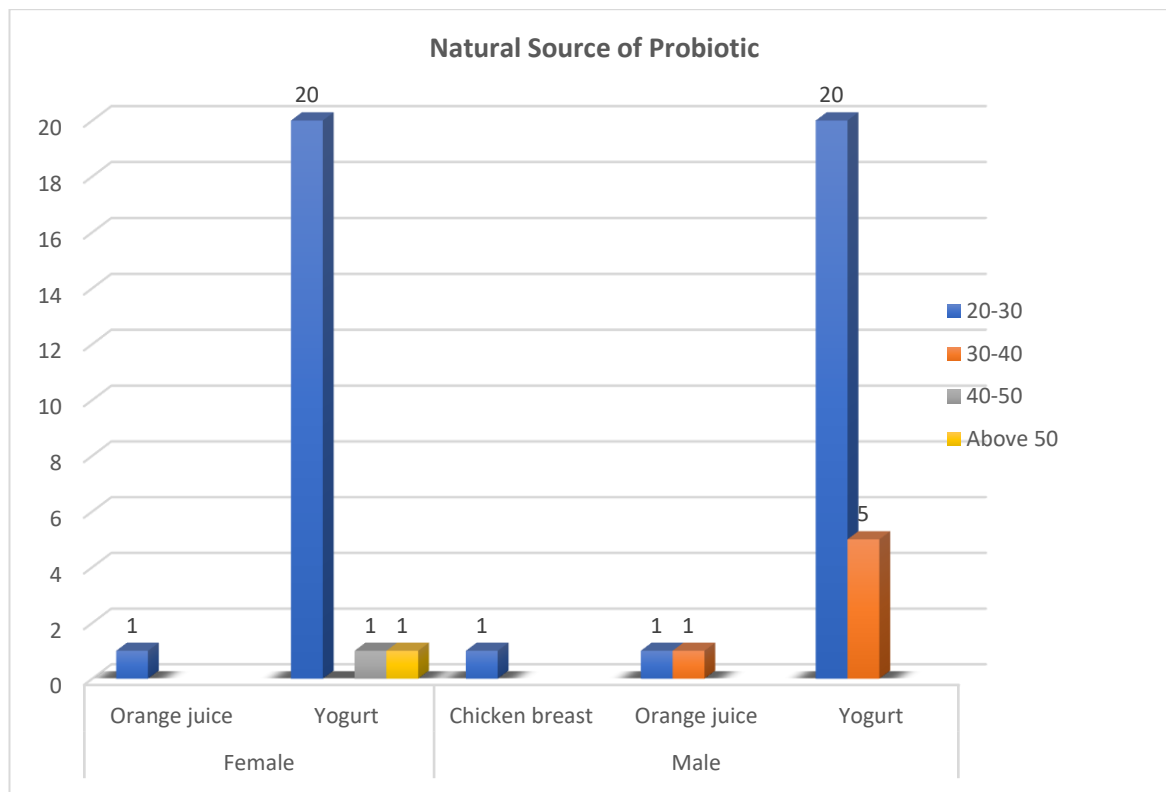


Figure 4.2

The survey contains the next question as according to the audience what do they feel is the natural source of probiotic from the food options given below that is orange juice , yogurt , chicken breast and white bread.

The correct answer was yogurt, to which the female audience valued 20 in number from the age group 20 to 30 gave the correct answer whereas male grouped 20 to 30 years of age valued 20 correct answers from the options.

For the age group female 50 above only 1 answered the correct answer whereas the other age grouped that is 30 to 40 female and male answered the wrong option as orange juice or chicken breast and

None of the audience answered as white bread.

4.3) What are probiotics according to you

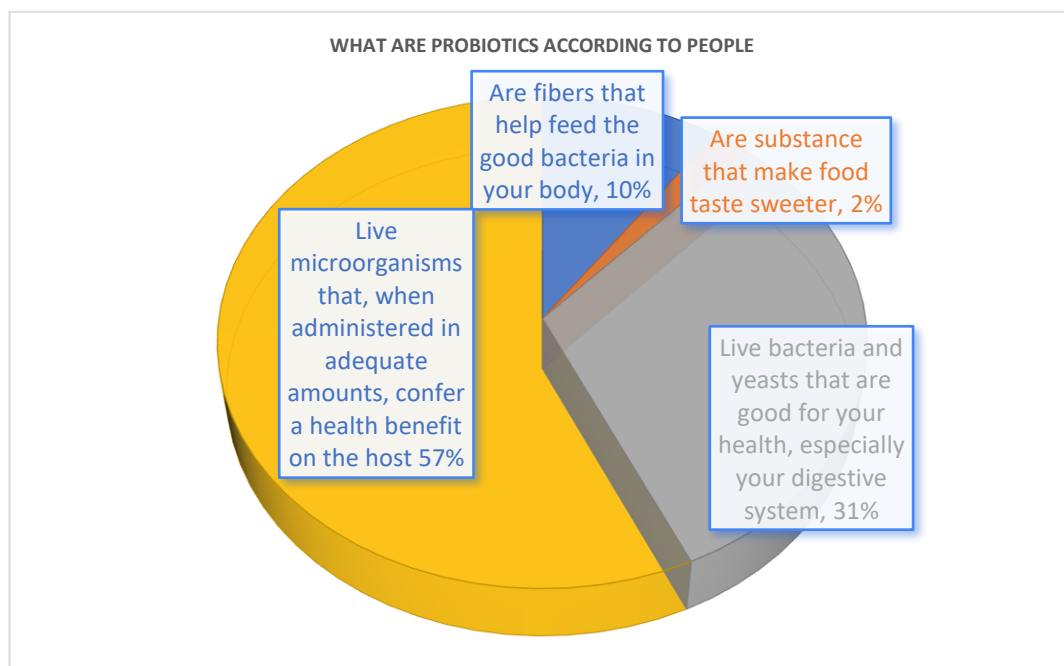


Figure 4.3

Our next question from the Google form asked the meaning of probiotics according to people , this is to check the basic knowledge of probiotics.

57% valued 29 of the crowd answered the option as - living microbes that when processed in sufficient volume grant a health value on the host.

Second highest answer was up to 31% and valued 16 which answered as- live bacteria and ease that are good for your health especially your digestive system.

10% of the audience valued 5 in number selected the answer as- probiotics are fibres that help to feed the good bacteria in your body.

Lastly 2% of the audience valued 5 number opted for the option as our substance that make food taste sweeter.

The correct option was the first option that is - live microorganism that when administered in adequate amount confer a health benefit on the host which was correctly answered by the majority of the crowd resulting in the overall progressive knowledge of the pro biotics in the people of India.

4.4) What are prebiotics according to you

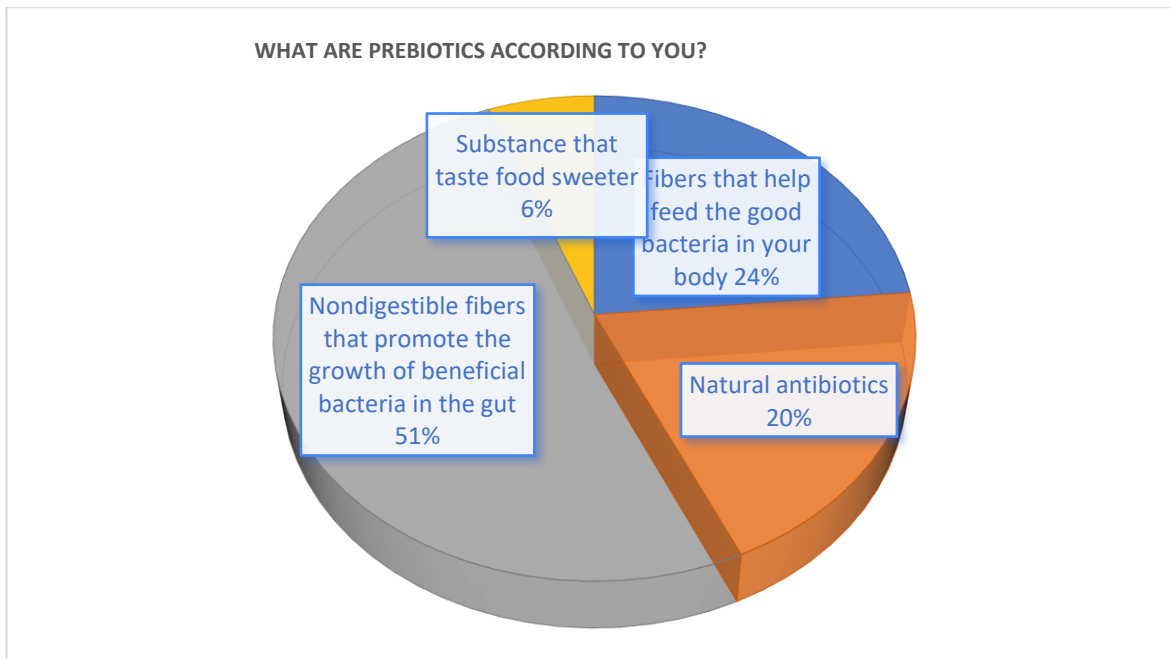


Figure 4.4

Our next question in the survey included the knowledge of people about the meaning of pre biotech to which 51% of the crowd valued 26 in number gave the correct answer as the non-digestible fibres that promote the growth of beneficial bacteria in the gut.

24% of the crowd valued 12 in number opted for the next option that is fibre that help feed the good bacteria in your body which is not the precise answer to a work question.

20% of the people valued 10 in number opted for the answer as natural antibiotics.

Finally with the least percentage that is 6% of the crowd valued 3 in number opted for the option as substance that taste food sweeter.

4.5) What are prebiotics (filtered post graduated audience)

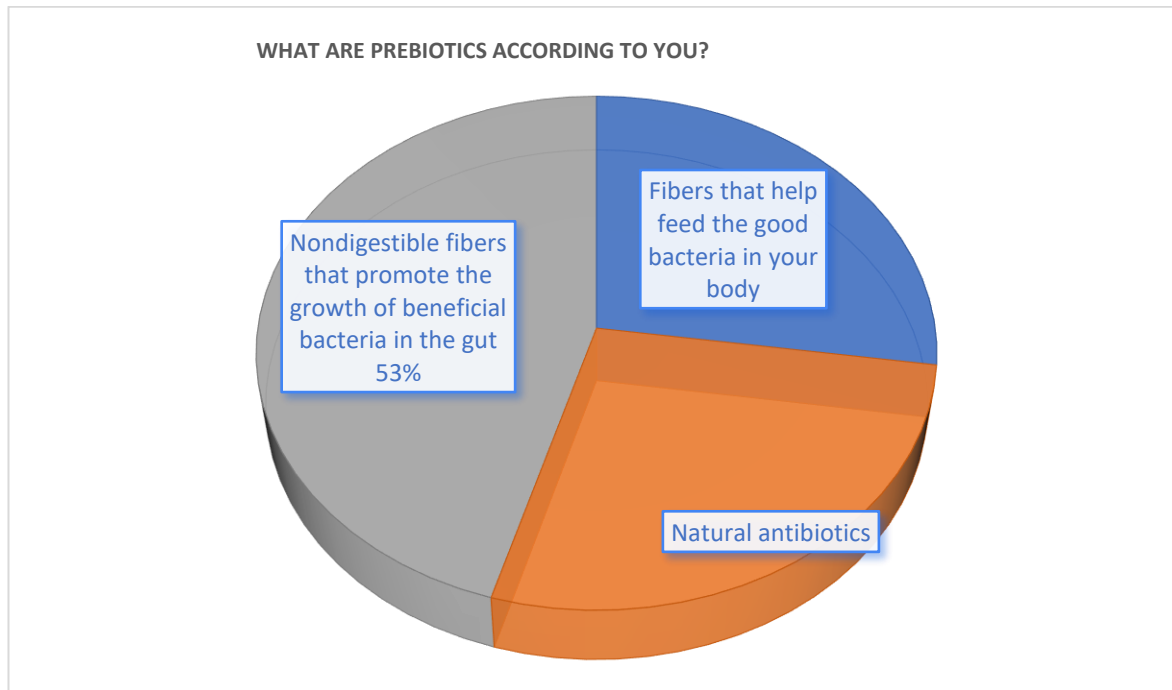


Figure 4.5

In order to know in detail about whether which sort of audience gave the maximum correct answers here we have added filter to our excel sheet of this particular pie chart, the results were the employed or post graduated audience gave the correct answer that is valued 10 in number and 53 % that is non digestible fibres that promote the growth of beneficial bacteria in the gut.

By this point, we already know our most knowledgeable and well aware audience are the post graduated employed ones.

4.6) Condition according to people probiotics are most beneficial for

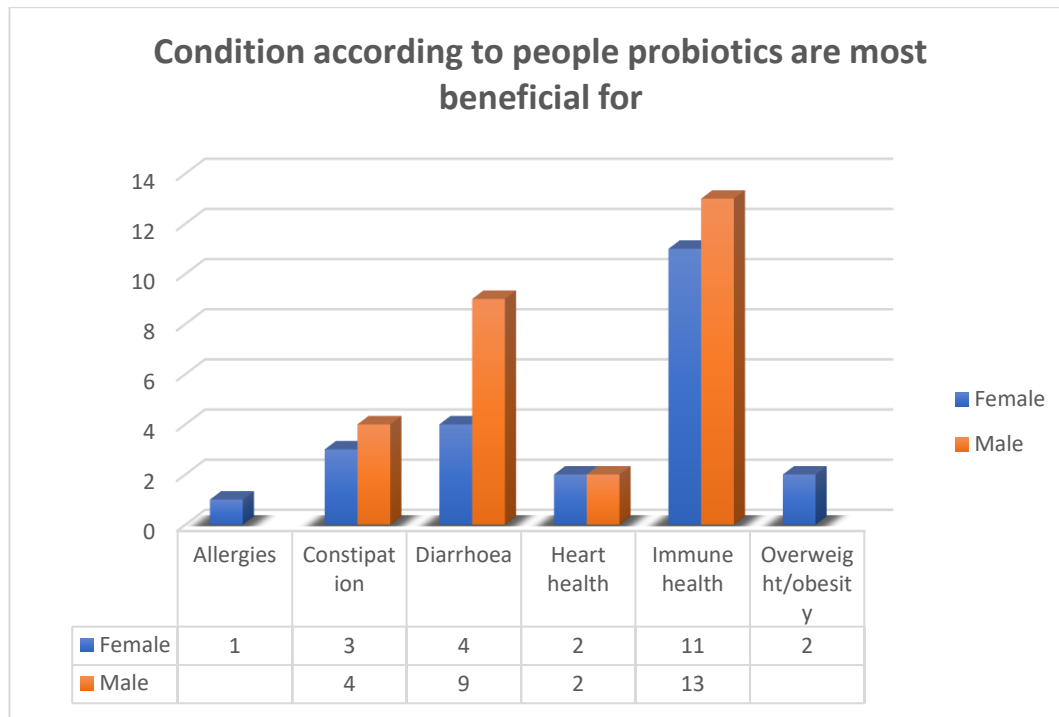


Figure 4.6

The next question from the survey was – **What condition according to the crowd are probiotics most beneficial for**

Majority of the crowd answered as immune health that is 11 in female and 13 in male, which is the correct answer.

Second highest answer was diarrhoea that is 4 in female and 9 in male, this is also the correct answer.

3rd highest answer was Constipation that is 3 in female and 4 in male.

4th highest was heart health that is 2 in female and 2 in male.

The rest least answered option were allergies and overweight / obesity.

By this question we know that our crowd is quite knowledgeable and aware about the conditions in which probiotics are most beneficial.

4.7) Condition according to people prebiotics are most beneficial for

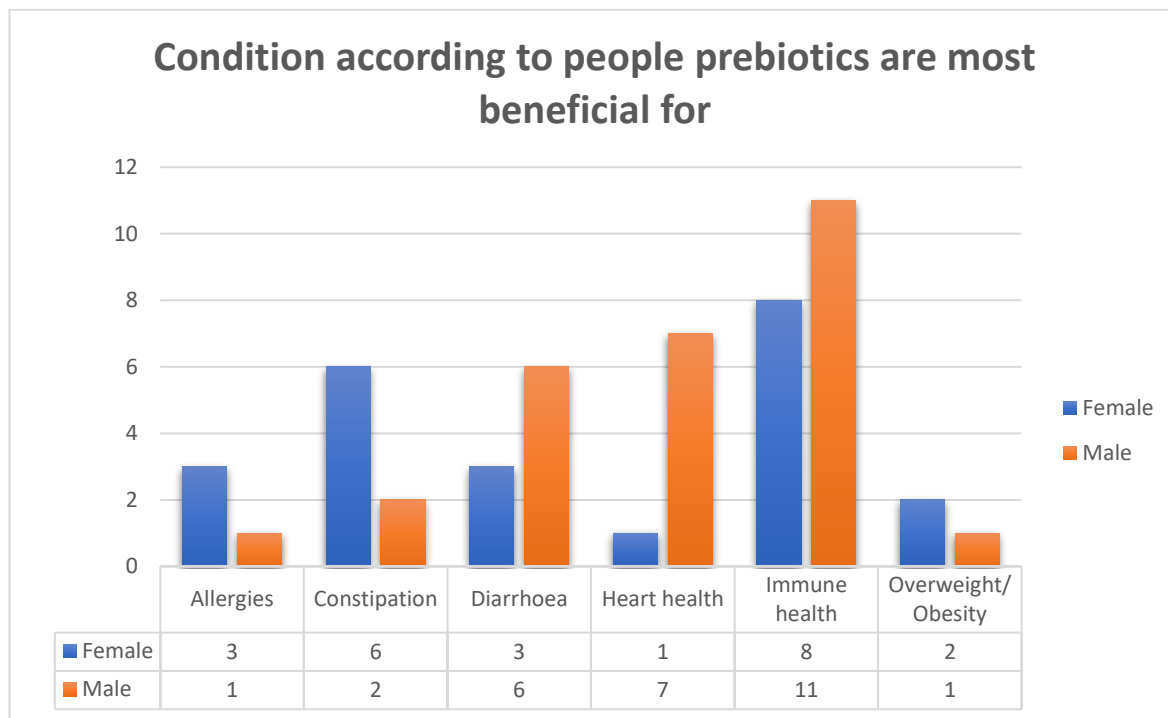


Figure 4.7

The next question from our survey was to know “which condition according to our people are prebiotics most beneficial for”-

The highest opted option was immune health that is 19 of our crowd from 51 total population, to be precise 8 for female and 11 for male answered the highest amount which came out to be the correct answer.

The second highest answer was also the correct one that is diarrhoea, total of 9 people opted for this option from which 6 were male and 3 were female.

3rd highest answer was a draw between Constipation and heart health that is 8 people from both.

The option “allergies” was opted by 4 individual and finally “obesity / overweight” were opted by 3 individual.

4.8) Do you think probiotics are beneficial for health?

Do you think probiotics are beneficial for health?

50 responses

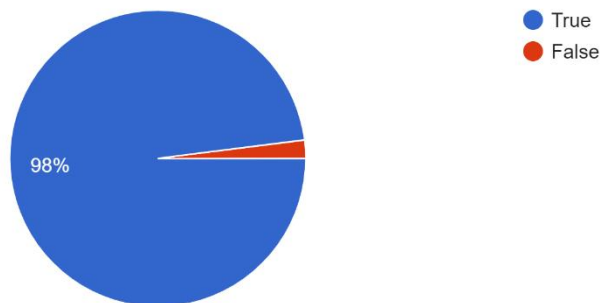


Figure 4.8

Here the question asked was whether probiotics are beneficial for health according to the audience , around 98% of the population answered it as true 2% answered as false.

The response is positive for the thought of crowd as probiotics as beneficial for health .

4.9) Which organisation coined the term “prebiotic”?

Which organization coined the term "prebiotic"?

50 responses

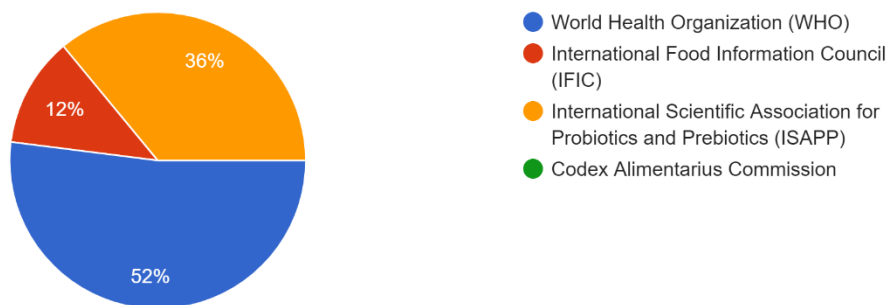


Figure 4.9

When asked which organization coined the term prebiotic, most of the audience answered WHO That is World Health Organization that is 52% which is not the correct answer.

36% of the crowd answered as ISAPP i.e. International Scientific Association for Probiotics and prebiotics, which is indeed the correct answer.

Whereas 12% of the audience answered as IFI i.e. International Food Information Council which is also the incorrect answer.

None of the audience answered as codex elementaries Commission.

This particular data clearly states that not the highest amount of crowd were awarded of the question.

Chapter 5

Conclusion.

In the current learning, it was watched that a good level of knowledge was among the population of India. Going into details it was observed that the age grouped from 20 to 30 years that is postgraduate or the employed once had the most awareness and knowledge towards the prebiotic and probiotic benefits. Also, the crowd in usual understood that dairy foods were also the original food source of probiotics, the maximum of the audience used them in their daily life.

As the masses from the age group 20 to 30 years were well aware on the other hand the other age group weren't aware about the most obvious benefits of prebiotics and probiotics . so , there was felt a need that more awareness programmes and social gathering , also the advertisements regarding probiotics and prebiotics must become mainstream and shed light on the advantages of these foods beyond the gastrointestinal health also for the immune system to work properly, with the emphasis on the revival of traditional foods.

The knowledge of prebiotics and probiotics also the benefits of their supplements to be used in our daily life are very important and needed to be focused on the earliest .

Chapter 6

Bibliography and references

- (1) Roberfroid MB. Prebiotics and probiotics: are they functional foods? *The American Journal of Clinical Nutrition*. 2000 Jun 1;71(6):1682S1687S.
- (2) Davani-Davari D, Negahdaripour M, Karimzadeh I, Seifan M, Mohkam M, Masoumi S, et al. Prebiotics: Definition, Types, Sources, Mechanisms, and Clinical Applications. *Foods*. 2019 Mar 9;8(3):92.
- (3) Hajela N, Nair GB, Ramakrishna BS, Ganguly NK. Probiotic foods: can their increasing use in India ameliorate the burden of chronic lifestyle disorders? *The Indian journal of medical research* [Internet]. 2014 [cited 2023 May 24];139(1):19–26. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3994739/>
- (4) Precup G, Pocol CB, Teleky BE, Vodnar DC. Awareness, Knowledge, and Interest about Prebiotics—A Study among Romanian Consumers. *International Journal of Environmental Research and Public Health*. 2022 Jan 21;19(3):1208.
- (5) Shireen A, Aneesh M. Knowledge and consumption of probiotics and prebiotics in India: a narrative review. *International Journal Of Community Medicine And Public Health*. 2021 Sep 27;8(10):5119.
- (6) Patait MR, Saraf KV, Wakchaure PM. Assessment of Knowledge and Awareness of Probiotics Among the Dental Post-Graduate Students- A Questionnaire Study. *Journal of Indian Academy of Oral Medicine and Radiology* [Internet]. 2022 Jan 1 [cited 2023 May 27];34(1):68. Available from: https://journals.lww.com/aomr/Fulltext/2022/34010/Assessment_of_Knowledge_and_Awareness_of.14.aspx
- (7) 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 Aug 28;16(17):3128.
- (8) Rahmah PA, Khairani AF, Atik N, Arisanti N, Fatimah SN. Correlation of Knowledge, Attitude, and Practice Toward Probiotics for the Digestive System Among Health Science Students. *Journal of Multidisciplinary Healthcare*. 2021 May;Volume 14:1135–44.

- (9) Markowiak P, Ślizewska K. Effects of Probiotics, Prebiotics, and Synbiotics on Human Health. *Nutrients* [Internet]. 2017 Sep 15;9(9):1021. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5622781/>