DISSERTATION REPORT

"CONSUMER KNOWLEDGE, USE AND PERCEPTION TOWARDS PREBIOTICS AND PROBIOTICS."

INDIAN INSTITUTE OF HEALTH MANAGEMENT AND RESEARCH,

JAIPUR, RAJASTHAN, INDIA

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CERTIFICATE

This is to certify that this project report entitled “CONSUMER KNOWLEDGE, USE AND PERCEPTION TOWARDS PREBIOTICS AND PROBIOTICS.” submitted to Indian Institute of Health Management Research University, Jaipur a bonafide record of work done by DIVYA YADAV under supervision of DR. SANDEEP NARULA from 01/04/2020 to 31/06/2020 ASSOCIATE PROFESSOR, SCHOOL OF PHARMACEUTICAL MANAGEMENT, IIHMR UNIVERSITY, JAIPUR

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BACKGROUND

Gut microorganisms are vital to numerous parts of human-being wellbeing including immunity, metabolism and neuro-behavioural characteristics. Various degrees of proof help the work of gut micro-organisms in human health.

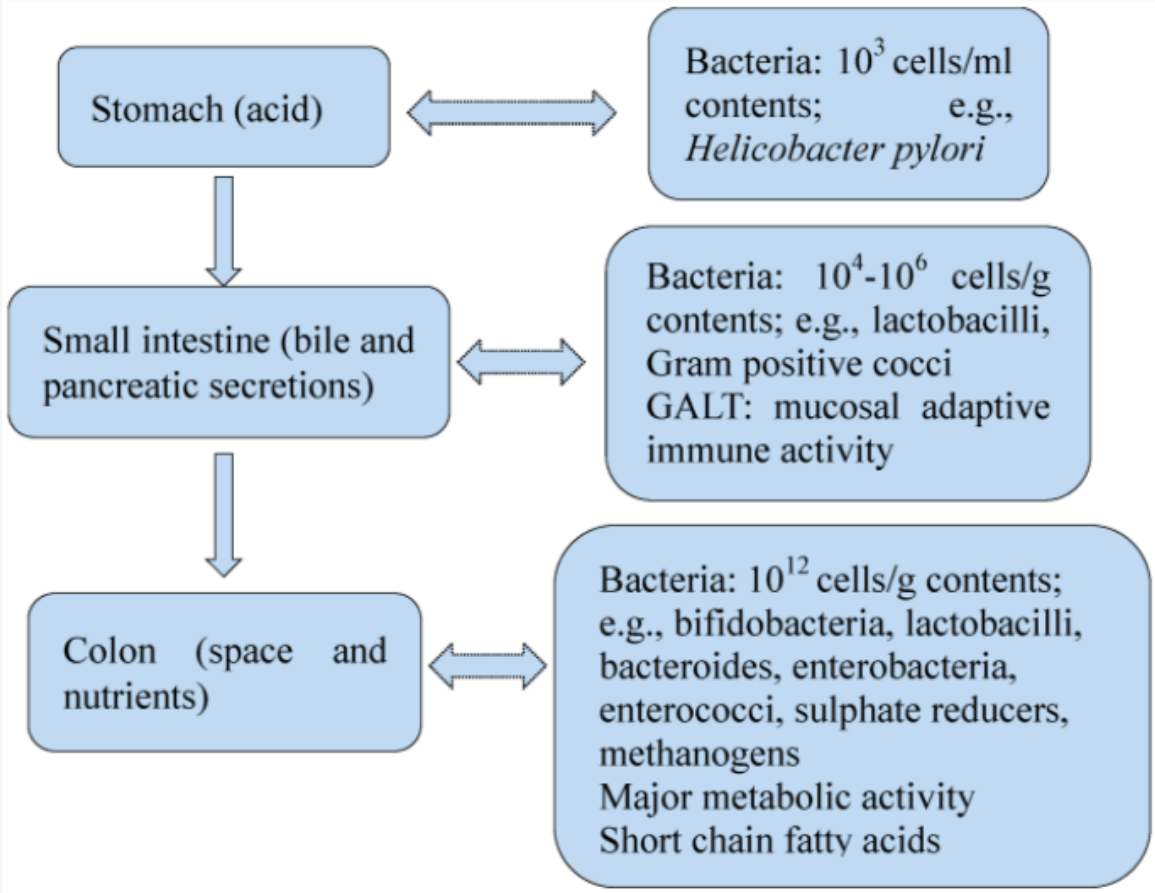
The human gut lining comprises of epithelial cells, lamia propria, and the muscularis mucosae, which sustains billion of microorganisms. These microorganisms are in ten folds higher in as compared to human cells. Gut microorganisms are significant parts of the microbial environment in gut.

The gut microbiota gives fundamental abilities to the fermentation of non-digestible substrates like dietary fibres and endogenous intestinal mucus. This aging backings the development of special microorganisms that produce short chain fatty acids (SCFAs) and gases. The major SCFAs created are acetic acid derivation, propionate, and butyrate.

Lesser bacterial variety has been seen in individuals with IBS that is inflammatory bowel disease, psoriatic joint pain, diabetes type 1, upper skin inflammation, autoimmune disorders with lactose intolerance, obesity, diabetes type 2, and blood vessel stiffness, than in solid controls. In Crohn's sickness individuals who have smoking tendency have lower gut microbiome variety. The relationship between diminished variety and infection shows that an animal types rich gut biological system is more powerful against ecological impacts, as practically related microorganisms in an unblemished environment can make up for the capacity of other missing species. Thusly, variety is by all accounts a by and large great marker of a "sound gut." But ongoing interventional contemplates show that significant expansions in dietary fiber can briefly diminish variety, as the organisms that digest fiber become explicitly advanced, prompting an adjustment of piece and, through serious communications, decreased variety. Prebiotics and probiotics helps in keeping the gut microbiota in adjusted and sound condition.

The human microflora present in the guts can be beneficial as well as pathogenic depending on the host health, now there is much interest in changing the micro floral composition off the gut in order to reach the full potential the beneficial aspects. The bacterial community within the gastrointestinal tract interacts with different kind of microbial species present there, it also interacts with the host. Microbial communities present in the gastrointestinal tract of different animals have develop according to their digestion strategy.

Figure 1. Reciprocal relationship between human gut bacteria and the host.



Probiotics

These are live microorganisms isolated from people and afterward refined in a lab to be utilized as an enhancement. At the point when we ingest them (regardless of whether in food or supplement structure), they get by in the gut and give advantages to us like the great microbes that we normally have.

Established probiotic effects are:

1. Prevention and decrease of length and complaints of rotavirus-actuated or antibiotic related loose bowels just as easing of grievances because of lactose intolerance.
2. Decrease of the centralization of malignancy advancing catalysts or potentially putrefactive (bacterial) metabolites in the gut.

3. Anticipation and mitigation of unquantified and nonuniform complaints of the gastrointestinal tract in healthy person.
4. Gainful consequences for microbial deviations, irritation and different grievances regarding: provocative illnesses of the gastrointestinal tract, Helicobacter pylori contamination or bacterial excess.
5. Standardization of passing stool and stool consistency in subjects experiencing obstipation or a crabby colon.
6. Anticipation or alleviation of allergies and atopic infections in newborn children.
7. Anticipation of respiratory parcel contaminations (normal cold, flu) and other irresistible sicknesses just as therapy of urogenital diseases. Lacking or at most starter proof exists regarding malignant growth avoidance, a purported hypocholesterolemic impact, improvement of the mouth verdure and caries anticipation or counteraction or treatment of ischemic heart infections or enhancement of immune system illnesses (for example joint pain).

Prebiotics

A prebiotic was first characterized as "a nondigestible food fixing that helpfully influences the host by specifically stimulating the development or potentially movement of one or a limited number of microorganisms in the colon, and hence further develops hosts wellbeing."

Since its beging, the idea of prebiotics has drawn in much consideration, stimulating scientific as well as industrial interest. Be that as it may numerous food components, particularly numerous food oligosaccharides and polysaccharides (counting dietary fiber), have been professed to have prebiotic action without due thought to the standards required. Not all dietary starches are prebiotics, and clear rules should be set up for arranging a food fixing as a prebiotic. These models are :

1. it helps to protect the enzymes from hydrolysis by gastric acid
2. Growth and development of the intestinal microbes for overall health of the individual

LITERATURE REVIEW

The human gut is a natural environment for a large variety and fast bacterial community, better substantial part of these bacterial colonies are still to be defined. However, the importance and effect of the bacteria living in the host help has been well no. The main function of the intestinal microflora consist of metabolic activities that result in production of energy and formation of various absorbable nutrients.

Scientific developments recently app open a new site and concluded a better knowledge and understanding off gastrointestinal tract as a very complex end allocated balanced ecosystem. There are many evidence supporting the thought of what generally considered as a normal good structure and function is the result of a complex interactions between the host and the microorganisms colonising the gut. A relationship between the normal flora and the host immune system exists with a co-dependency off the host and the gut microorganisms, the gut microorganisms helps in synthesising various vitamins and also helps in the immune support of the host.

Another time in clinical science has unfolded with the acknowledgment of the critical role of the "forgotten organ," the gut micro-biota, in wellbeing and illness. Integral to this advantageous cooperation between the microbiota and host is the way wherein microscopic organisms and in all probability different microorganisms contained inside the gut speak with the host's invulnerable framework and partake in a variety of metabolic cycles of shared advantage to the host and the organism. The appearance of high-throughput approaches and the elaboration of modern logical frameworks have worked with the definite portrayal of the sythesis of the microbial constituents of the human gut, as at no other time, and are currently empowering correlations with be made among wellbeing and different infection states. Albeit the last methodology is as yet in its outset, some significant experiences have effectively been acquired about how the microbiota may impact various sickness measures both inside and far off from the gut. These revelations additionally lay the preparation for the advancement of helpful procedures that may adjust the microbiota (e.g., using probiotics). Albeit this region holds a lot of guarantee, all the more top notch preliminaries of probiotics, prebiotics, and other microbiota-adjusting approaches in stomach related problems are required, just as research center examinations of their systems of activity.

The term microbiota is to be liked to the more seasoned term vegetation, as the last neglects to represent the numerous nonbacterial components (eg, archea, infections, and growths) that are currently known to be typical occupants of the gut. Given the generally more prominent arrangement that presently exists of the part of microorganisms, in correlation with different constituents of the microbiota in wellbeing and infection, gut microscopic organisms will be the essential focal point of this audit. Inside the human gastrointestinal microbiota exists an small parts which is links together to make an complex environment of around three hundred to five hundred microbial species, which includes almost two million quantity. Indeed, the quantity of microorganisms inside the gut is

roughly multiple folds that of the entirety of the cells in the human body, and the combined bacterial genome is immensely than the human gene structure.

Human wellbeing is a definitive objective of our endeavors in working on the human existence. Extraordinary food varieties are without a doubt significant in accomplishing human wellbeing. In any case, indulging essentially prompts weight and diabetes. These constant infections will thus influence the human wellbeing. Hence, "dietary limitation and appropriate exercise" were presented in the human day by day life. Various food sources cause different consequences for the human wellbeing. The intake of dietary fiber is needed for the nutritional requirement of the body to maintain the health of individuals. Also, the theory that "hunger sensation comes from gut greenery" welcomes new light to the exploration on the organic inspiration for people to eat food. This theory has been slowly exhibited utilizing the adaptable fasting innovation by giving extraordinary food varieties, for example, plant polysaccharides and dietary strands. The reaction to food-requiring signals from the gut verdure to these food sources shows the significance of the gut greenery in working on human wellbeing. The gut vegetation is presumably a fundamental factor for deciphering the food-eating signals and changing the nourishment over to our body. Subsequently, "gut greenery need guideline" is created to ensure human wellbeing.

Taking under consideration the various quarrels , specially the difference in view of usual yogurt culture and products derived from probotic culture and products, the main objective of the given definition as the one of the definition of the term probiotic given by Havenaar and Huis In't Veld "a preparation of or a product containing viable, defined microorganism insufficient number, which alters the microflora (by implanting or colonising) in a compartment of the host and by the exert beneficial health effects in the host."

There are many beneficial health attribute to use of probiotics. Given below are some of the well established outcomes:

- low frequency and duration of diarrhoea associated with anti biotics, rotavirus infection, chemotherapy, and, to a lesser extent traveler's diarrhoea
- Stimulation of humoral and cellular immunity
- decrease in unfavorable metabolism

Prebiotics where defined as indigestible food ingredients that have positive affects on the host by inducing specific growth and or activity of one or a limited number of bacteria in the gut, thus improving host health.

Although all properties of fibers not all fibers are prebiotics. classification of a food ingredient:

- resists gastric acidity, hydrolysis by million enzyme and absorption in upper gastrointestinal tract
- is formatted by intestinal microflora
- selectively stimulates the growth and/or activity of intestinal bacteria associated with health and well being.

OBJECTIVE OF THE STUDY

The objective of the study is to understand the consumer knowledge, use and perception towards prebiotics and probiotics.

RESEARCH METHODOLOGY

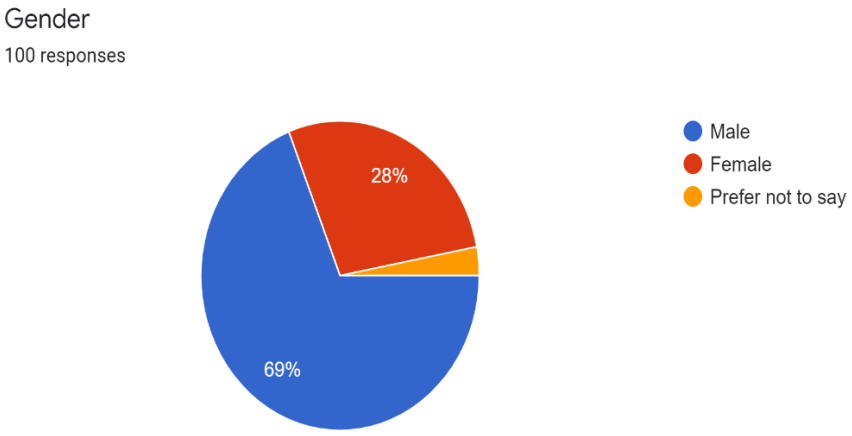
- **Sample Design-** Qualitative and Quantitative research approach will be adopted.
- **Data Source**: The data will be collected by both primary and secondary research methods.
- **Tool :** Data will be collected by questionnaires in the form of google forms
- **Data Collection Method:** Primary data will be collected through the responses received by the google forms and the secondary data will be collected by various sources.
- **Duration**: 3 months
- **Sample Size:** 100-120
- **Study Area:** Delhi, Ghaziabad, Noida

RESEARCH DESIGN

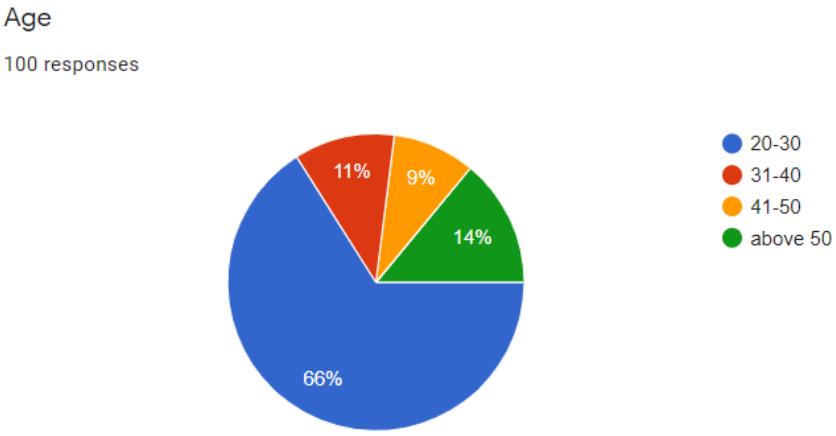
The respondents were asked different questions which would help in getting the insights about the knowledge, use and their perception towards perbiotics and probiotics. The question asked to the participants were

1. Gender
2. Age
3. Education
4. Occupation
5. According to you what are Probiotics
6. According to you what are Prebiotics
7. Do you believe probiotics are beneficial for health ?
8. Do you think that probiotics are harmful for health?
9. Do you believe prebiotics are beneficial for health?
10. Do you think that prebiotics are harmful for health?
11. Which conditions you believe probiotics are most beneficial for
12. which condition you believe prebiotics are most beneficial for
13. Do you include prebiotics or probiotics in your diet
14. If yes then in which form do you prefer consuming probiotics
15. How would you select which probiotic to consume?
16. Would you use probiotics if they were recommended by a Medical Specialist, Dietician or Nutritionist, Pharmacist, Friend, Family member.

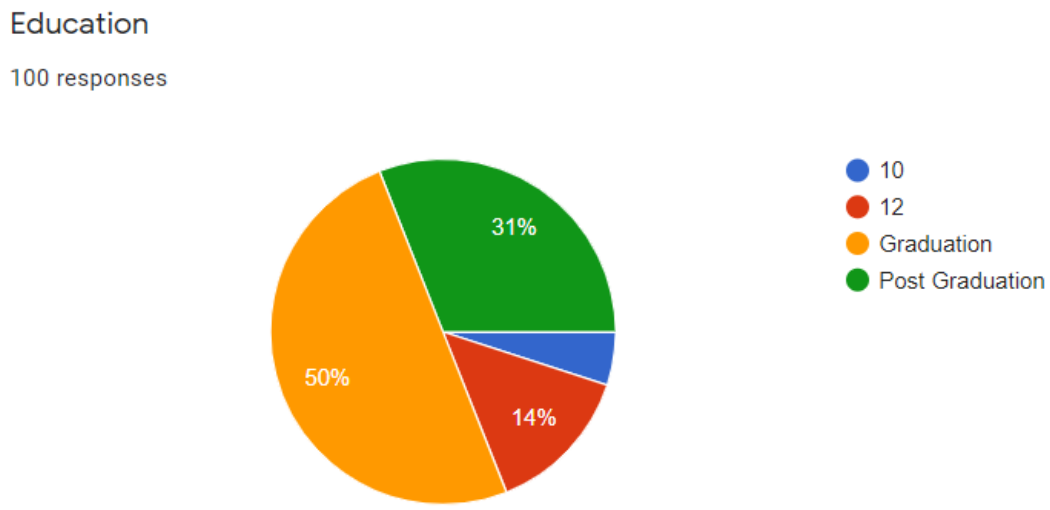
ANALYSIS OF DATA



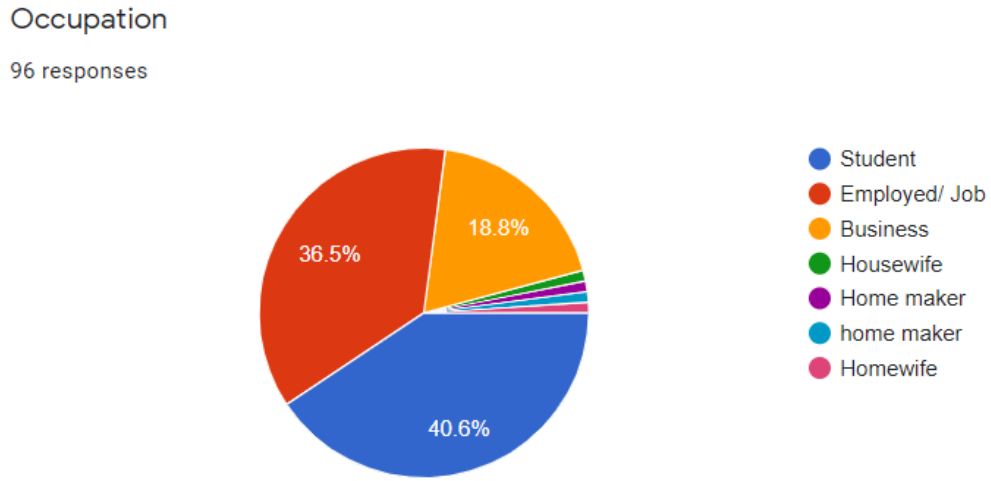
Most of the participants were male, the male respondents were 69% of the total population where as 28% were the females and the rest 3% of the participants prefer not to disclose their gender.



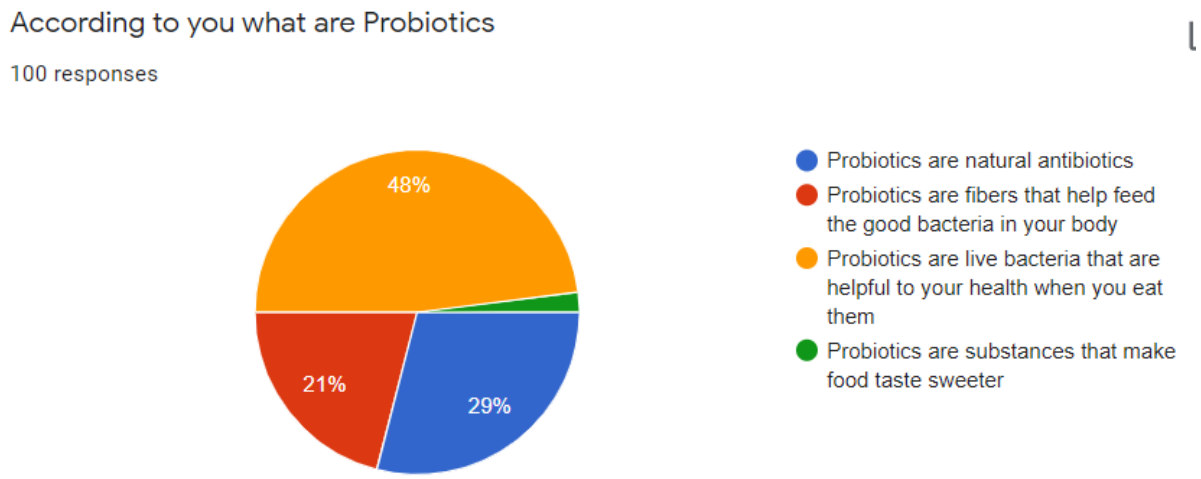
large majority of the participants were the young generation between the age of 20-30 which constituted of 66% of the total population that took part in the survey, apart from that 14% of the population was above 50 years of age, 11% of participants were between the age of 31-40 and the rest 9% of the population was between the age of 41-50.



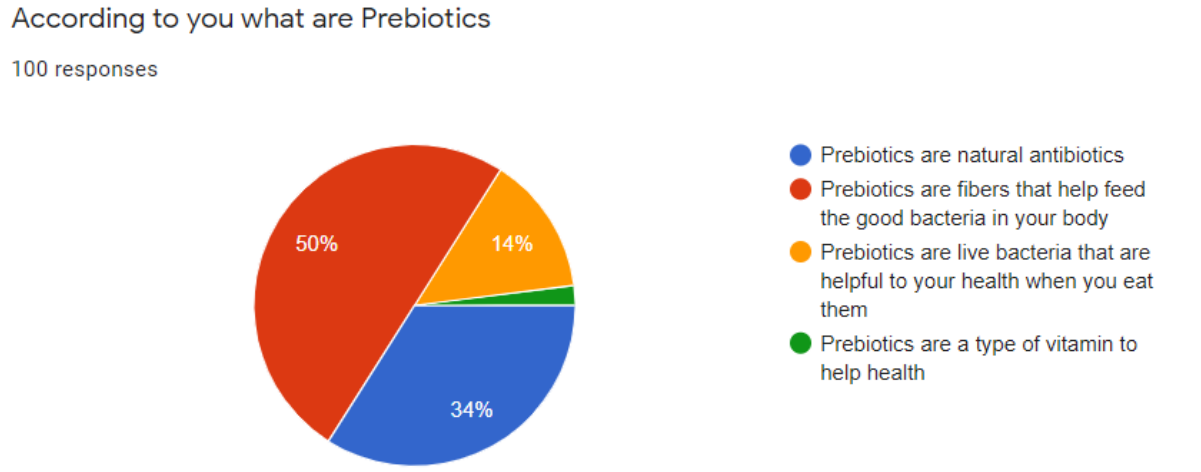
The education of the participants were also required to understand the relation between the knowledge of the prebiotics and probiotics with the education of the participants. 50% of the population was graduated 31% of the population was post graduates, 14% of the population studied till 12th standard and the remaining 5% of the population studied till 10th standard.



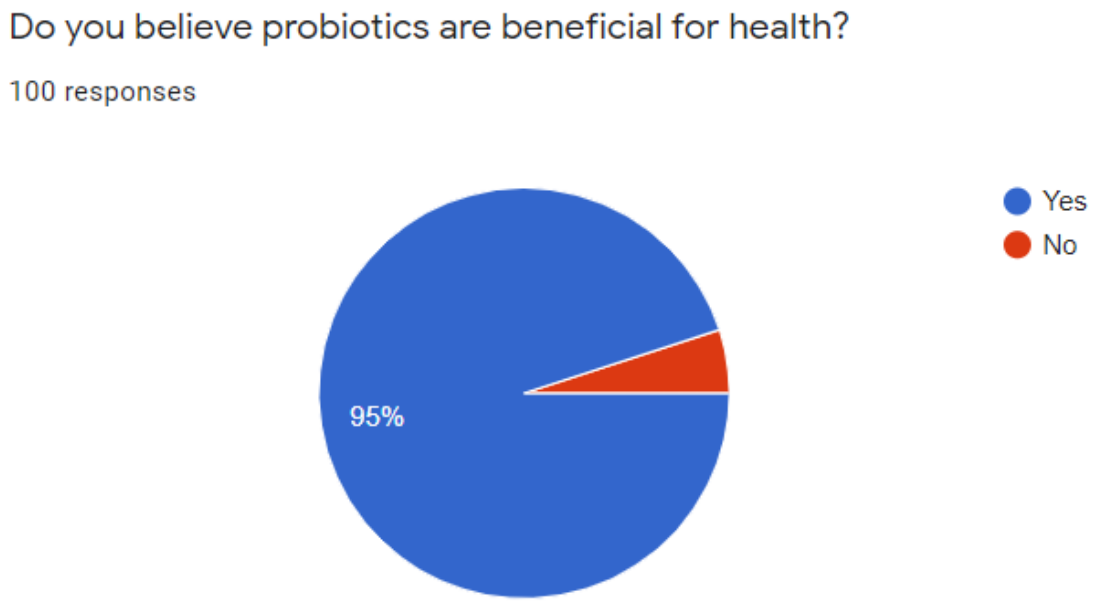
The most of the participants were students constituting of 40.6% of the total participants the category which comprise of almost the other half of the population were employed in various sectors, 18.8% of the population was having business and the left 4.1 % of the population were housewives.



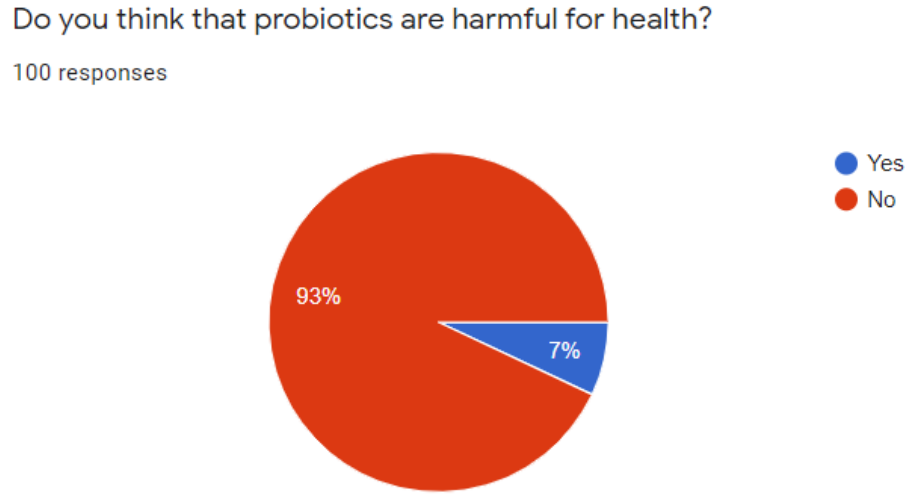
Looking at the responses less then half of the percentage of the population knew about the about the probiotics out of total population only 48% of the population could correctly tell about the probiotics, other 52% of the population had the wrong answer 21% of the population set that probiotics are the fibers that are eaten by the good bacteria in the body and other 29% of the population presumed that probiotics are natural antibiotics the rest of the population define probiotics as the substances which incorporates a sweeter taste to the food.



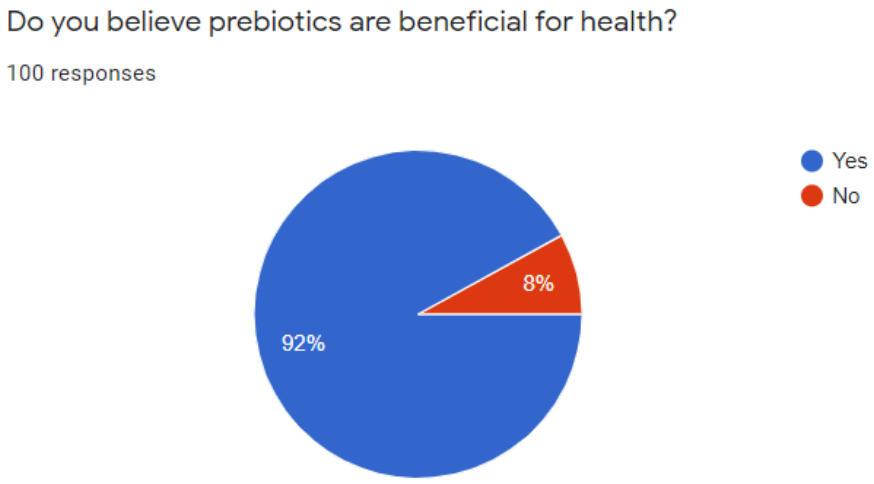
When asked about prebiotics most of the population had answer it correctly about 50% of the population said that prebiotics of fiber that helps feed the good bacteria in your body and rest of the population could not currently define the prebiotics 34% of the population said that prebiotics are natural antibiotics where as 14% of the population said prebiotics are living bacteria that are beneficial to the health when they are eaten and the remaining 2% of the population said that the probiotics are type of vitamin help health, by this can be presumed that most of the population was confused between prebiotics and probiotics.



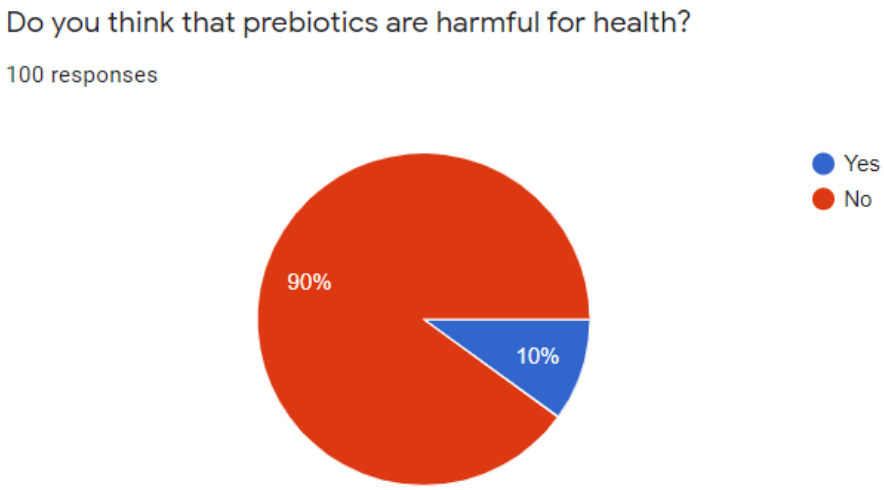
When asked to the participants about the benefits of robotics most of the population agreed that probiotics are beneficial for health there was a small population of 5% who disagreed with the fact that probiotics are beneficial for health.



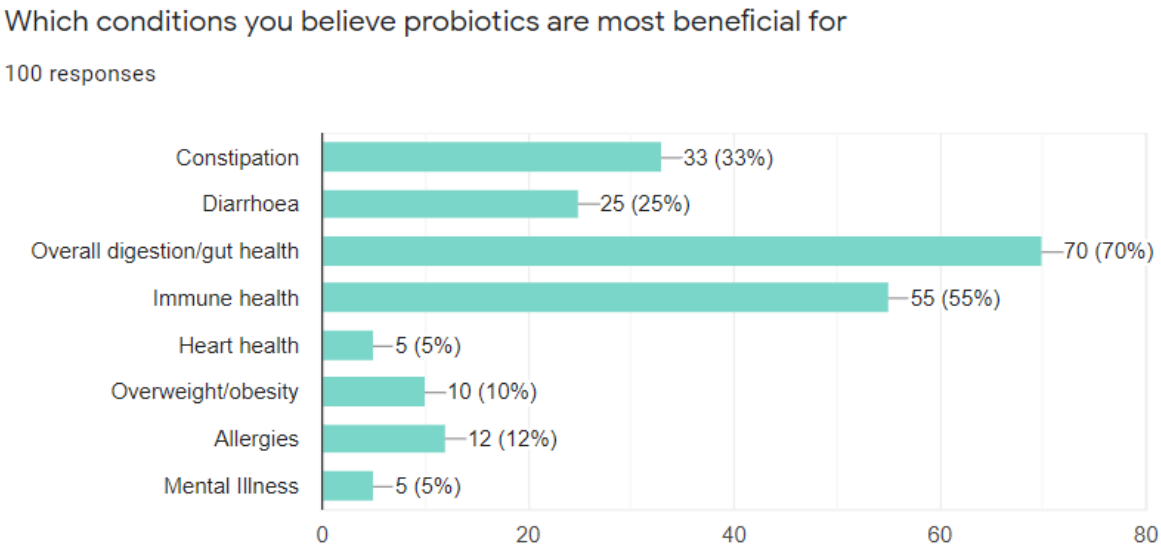
The participants were asked whether or not they think that probiotics are harmful for health to which the majority of population that is 93% of the population disagreed and believed that the probiotics are not harmful for the health. A small population of 7% agreed that probiotics are harmful for health



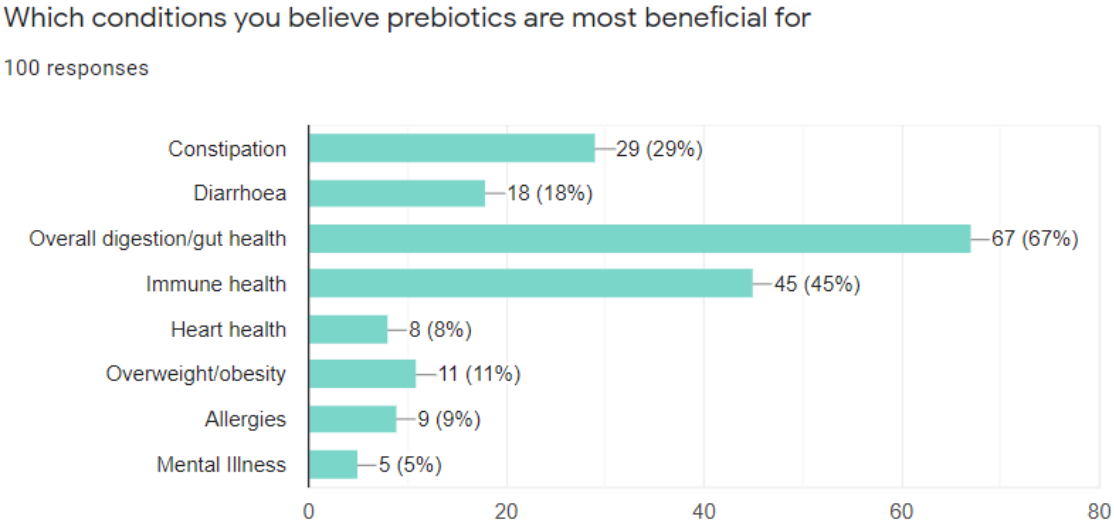
Similar question was asked with regards to prebiotics for which 92% of the population agreed to the fact that prebiotics are beneficial for health and the remaining eight percent of the population disagreed and set that prebiotics are not beneficial for the health.



Participants were ask whether or not the prebiotics cause any harmful effects on the health, to which 90% of the population disagreed and were in support that prebiotics are beneficial for health the remaining 10% of the population said that the probiotics are harmful for the health.

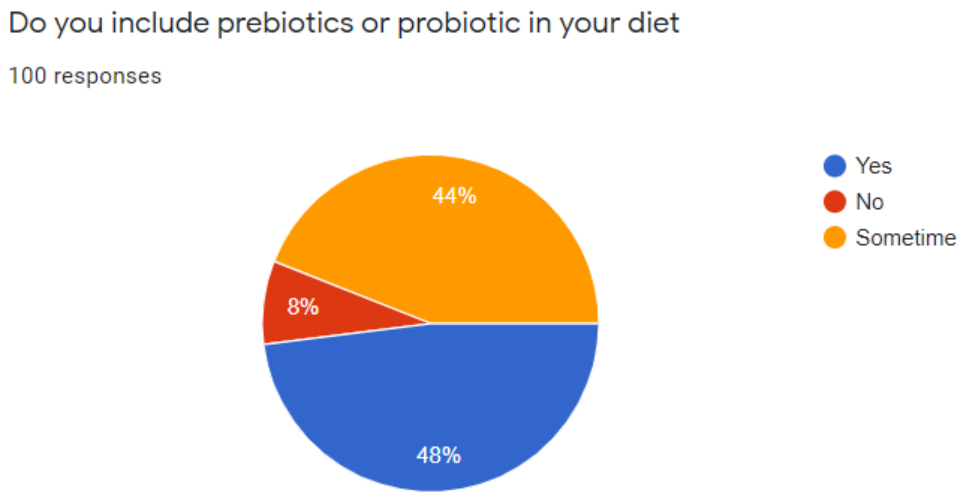


The participants where ask to which condition do they believe that probiotics our most beneficial for to which 70% of the population said that probiotics are most beneficial for overall gut health, 55% off the population suggested that probiotics are most beneficial in the immune health there were other responses which constituted of 25% of population agreeing to the benefits off probiotics in diarrhoea, 33% of the population said that probiotics are beneficial in Constipation, 5% of population suggested that it helps in heart health, 10% population was in favour with obesity, 12% of population said it is beneficial with allergies and the remaining 5% of the population agreed for the benefits of probiotics in mental health.

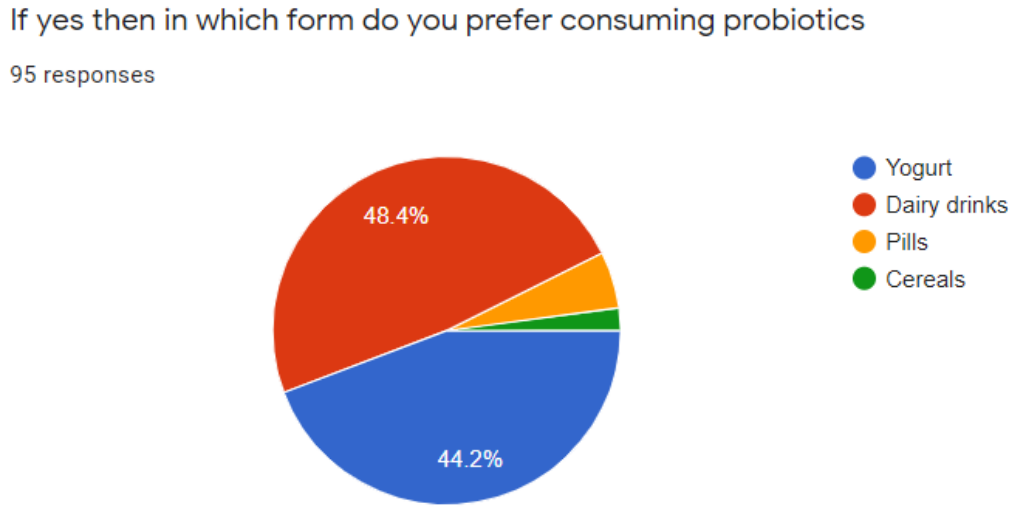


The same question was asked in reference with prebiotics to which most of the population that is 67% of the participants agreed beneficial effects of prebiotics in overall gut health and the second largest poll was with immune health and the rest was as follows 29% of the population said that prebiotics are most beneficial in Constipation, 18% of the population said

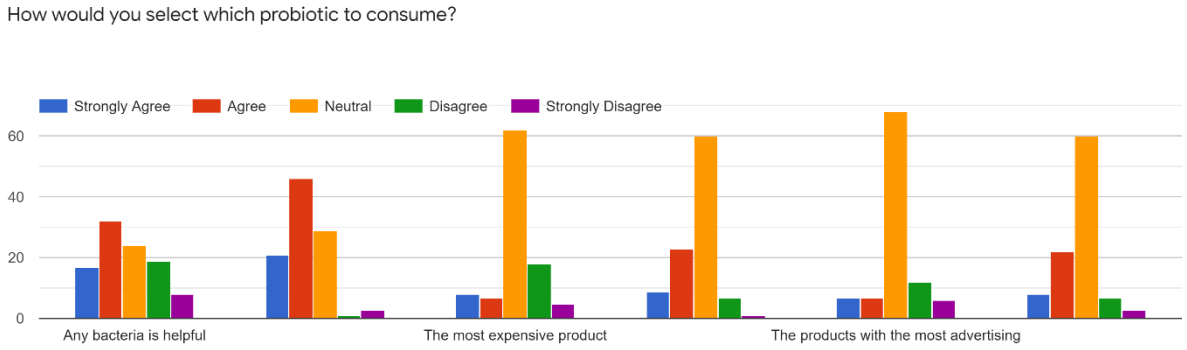
diarrhoea, 8% of the population agreed to heart health, 11% of population said obesity, 9% with allergies and last 5% said that prebiotics are most beneficial for mental illness.



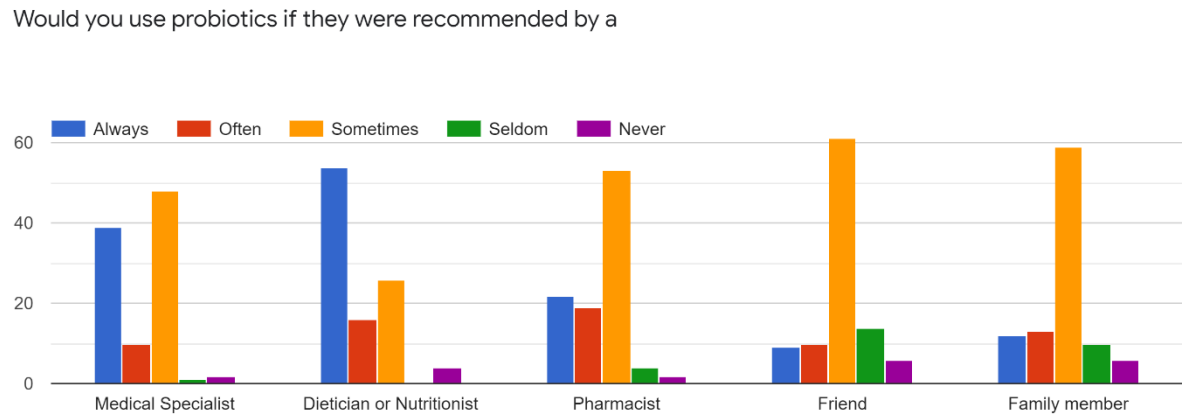
The participants were asked whether or not they include prebiotics or probiotics in their diet to which 48% of the population said that they include prebiotics or probiotics in their diet, 8% of the population said that they do not include prebiotics or probiotics in their diet and the remaining 44% of the population said they sometimes include prebiotics and probiotics in their diet.



To the participants who answered the previous question as yes where asked in which form do they prefer consuming probiotics to which most of the population which consistent of 48.4% said they prefer consuming probiotics as dairy drinks 44.2% population fed yogurt and the rest of population comprising of 7.4% said that they prefer probiotics as pills or cereals



The participants were asked about the selection criteria probiotics which they consume to which 32% of the population said that any bacteria would be helpful 46% of the population agreed start only specific strains should be trusted 62% of the population was neutral about the price of the product which should be trusted, participants were also neutral about the number of strains in the product 60% of the population world neutral about this the participants did not mind weather the product was most advertised or not as 68 percent of the population pause neutral about this criteria too.



The last question was asked to know whether or not the participants consume the probiotics on the recommendation off medical specialist, titration on nutrition list former pharmacist, friend or family members. To this 48% of the population set that day sometimes consume probiotics when recommended by Med medical specialist and 39% of the population said they always consume probiotics when recommended by a medical specialist. 54% of the population said that they always consume probiotics when they are recommended by a nutrition or dietitian 53% of the population set they would sometimes consume probiotics when recommended by a pharmacist, 61% of the participants set day sometime consume when it is recommended by a friend and 59% of the population set day sometime consume probiotics when recommended by a family member.

CONCLUSION

By analysing the responses given by the participants it can be concluded that the participants knew about the prebiotics and probiotics but they cannot clearly defined the difference between the prebiotics and probiotics, still most of them believe that prebiotic and probiotics are essential components for the gut health which eventually result in overall human health. Although knowing the importance of prebiotics and probiotics not all population were including them in their diet and the population which include free biotics of probiotics in their diet prefer consuming them as dairy drinks or yogurt which do not provide sufficient amount of bacteria required for a healthy gut, there is a very less population which prefer consuming probiotics as pills which may be concluded as there is very less population off individuals which have knowledge about probiotic pills as when asked about the criteria under which they may select the probiotics for consumption for most of the given options the answers were neutral which may be seen as the population was not bothered enough about the bacterial strains used in the product the price of the product. they believe that any bacterial strain would be helpful for selecting the probiotic, this may be because of lack of knowledge about healthy gut and microbial flora which is required for maintaining the health of the gut. The study also points out add the fact that people are more comfortable in taking the products which are suggested bye the dietician or a nutritionist as compared to the recommendation off the family, friend or a pharmacist.

When choosing the probiotic for consumption the consumers don't have exact idea about which bacteria's would be beneficial for their complete gut health and which probiotic composition they should be choosing for a regular consumption for a overall health.

As the gut health is as important as any other organ there should be a proper knowledge and awareness about the benefits of healthy gut and what all are the food components or products which should be chosen for maintaining and sustaining it's health. Probiotics and prebiotics are a new era for a complete health because as it is said a healthy gut is a key to a healthy body.

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