IJBPAS, December, 2024, 13(12): 6070-6079

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

KNOWLEDGE, AWARENESS ON THE USE OF ANTIBIOTICS AND PROBIOTICS IN ADULTS: A CROSS-SECTIONAL STUDY

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Received 24th Aug. 2023; Revised 25th Oct. 2023; Accepted 20th Jan. 2024; Available online 1st Dec. 2024

https://doi.org/10.31032/IJBPAS/2024/13.12.8444

ABSTRACT

Background: This study's goal was to look into young adult's use of probiotics and antibiotics.

Methods: The general population was surveyed online to learn more about their knowledge, attitudes, and views of probiotics, as well as aspects relating to the use of antibiotics and probiotics to treat diarrhoea and factors influencing choice of intake.

Results: The survey was completed by 100 members in total. Antibiotic resistance is becoming a significant global concern. The majority of participants roughly 75 percent used antibiotics, and 63.7% were not aware that some drugs could harm the gut microbiome. The study's result that 90.3% of participants would take probiotics as medicine if their doctor recommended it was the most encouraging. Probiotics are still a contentious topic for many individuals, and little is known about them. Probiotic knowledge among the participants also differs substantially. This gap needs to be closed on several levels in order to reach the broadest audience and promote the growth of a healthy generation.

Conclusion: Despite widespread knowledge of the detrimental effects of antibiotics on the gut flora and the advantages of co-prescribing probiotics, probiotic use is still low in many countries.

Keywords: Probiotics, Antibiotics, Gut-microbiota

1. INTRODUCTION

Globally, gastroenteritis is a significant health burden; two billion cases are reported each year **[1]**. It is the second biggest cause of death and generates major morbidity, especially in poorer nations **[2]**. Diarrhoea is characterized by its pathophysiology as an interruption of the enterosystemic water

cycle, which results in the loss of water and electrolytes and, in the absence of replacement therapy, dehydration. Oral rehydration remedies make up for the losses but do not alter the volume or consistency of the faeces or restore normal gastrointestinal flora **[3]**. Drugs used to treat diarrhoea, typically in adults, reduce intestinal transit **[4]**.

The majority of antibiotics consumed by humans are used in basic care. The use of antibiotics may be inappropriate in large part, according to reports, and attempts to decrease and focus antibiotic use are encouraged. However, if antibiotic therapy is deemed necessary, having a simple, affordable, and secure approach to avoid the negative effects of the prescribed antibiotic is helpful.

"Live microorganisms that, when administered in sufficient amounts, confer a health benefit on the host" is the definition of probiotics. Probiotics are administered to patients with digestive issues with the hope that they may help restore a healthy balance to the gut flora. Probiotics are thought to improve intestinal health through a variety of mechanisms, including the induction of immunity, competition for nutrients, inhibition of pathogen adhesion to the epithelium and mucosa, inhibition of epithelial invasion, and production of antimicrobial substances **[5]**. Inflammatory bowel illness, obesity, colon cancer, and other ailments have all been linked to antibiotic-induced changes in the composition and operations of the intact gut microbiome **[6]**.

The gut is thought to be an ideal ecological setting for microbiota to survive, flourish, and positively influence the health of the host by giving nutrients and aiding in digestion, intestinal development, and immunological response. Probiotics are a healthy alternative for those who have gastro intestinal tract (GIT) problems and gut disease as a result of an imbalance in gut microbiota since they can affect the intestinal microflora and improve the balance by increasing the beneficial microorganisms. This pilot study sought to determine how well people understood and utilized probiotics as a substitute for antibiotics in the treatment of acute diarrhoea as well as how much they valued the scientific backing for these probiotics **[7]**. This pilot study sought to determine how well people understood and utilized probiotics as a substitute for antibiotics in the treatment of acute diarrhoea as well as how much they valued the scientific backing for these probiotics.

2. MATERIALS AND METHODS

2.1.Public Involvement

By responding to the online survey, the general public participated in the study. The survey was both voluntary and anonymous. If they wanted to obtain a copy of the results,

the respondents had the option to enter their email address.

2.2.Methods

To learn more about the awareness and knowledge of probiotics, a survey was given to 150 participants, and data from 100 of them were collected. There was no need for an ethical committee's permission because this study was based on general public opinions gathered through an internet poll. The survey's primary goals were to gauge (i) existing practices regarding the use of antibiotics, (ii) rates of probiotic use, and (iii) perceptions of probiotic advantages. The questionnaire asked about the use of probiotics and antibiotics to treat diarrhoea, as well as on sanitary practices, understanding of antibiotic resistance, the value of using probiotics, and the role that antibiotics play in gut flora destruction **[8, 9]**.

The questions were modelled after those that were asked in previously published studies on probiotic knowledge. There were three sections to the survey. The demographic questions made up the first segment Section 1, while the probiotics knowledge questions made up the second section. On a 5-point Likert scale with the following grades: no knowledge (1), little knowledge (2), medium knowledge (3), good knowledge (4), and very good knowledge (5), the respondents in Section 2 were first asked to rate their understanding of probiotics.

After that, they were quizzed on the meaning and details of probiotics. The third component of the survey asked respondents about their probiotic usage history, their opinions of its beneficial effects, and if they had ever suggested using probiotics to friends, family members, or patients. The respondents were questioned about their primary sources of probiotics-related information and their interest in learning more about probiotics at the conclusion of Section 3. The average time to complete the survey was seven minutes.

3. RESULTS AND DISCUSSION

3.1. Respondents' Self-Evaluation of Knowledge of Probiotics

Using a 5-point Likert scale with five different grades (No knowledge, little knowledge, medium knowledge, good knowledge, and very good knowledge), the respondents rated their knowledge about probiotics. Most people thought their knowledge was either good (34.2%) or middling (38.4%). The understanding of probiotics was judged as high by some (6.9%), limited by some (40.7%), and completely unknown by the remaining 32.9%.

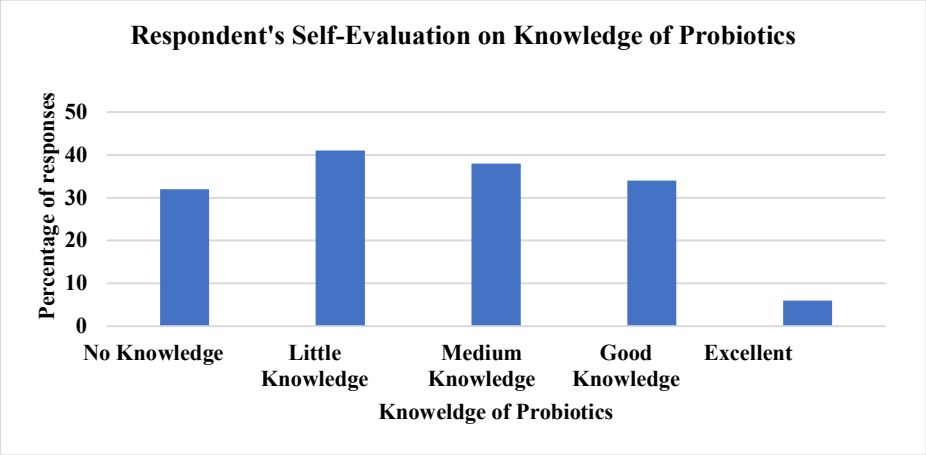

Figure 1: Respondent's Self-Evaluation of Knowledge of Probiotics

3.2. Respondent's Knowledge of the Correct Definition of Probiotics

The respondents then selected one of five definitions of probiotics: (1) probiotics are dead microorganisms that, when administered in adequate amounts, confer a health benefit to the host; (2) probiotics are live microorganisms; (3) probiotics are all microorganisms consumed with foods and dietary supplements; and (4) probiotics are all microorganisms that adhere to intestine.

42.2% of respondents selected answer 2, 38.2% selected answer 3, 32.2% selected answer 4, 22.2% selected answer 1, and 52.2% selected answer 5. The accurate definition was answered by answers 2, 3, 4, and 5, with answer 2 being selected by 42.2% of respondents, 38.2% by answer 3, and response 3 by 32.2% of respondents. There were statistical differences in the public's understanding of the proper definition of probiotics. Less than two thirds of the general public who knew what a probiotic was could correctly define it, despite having a knowledge of the term that exceeds 60%.

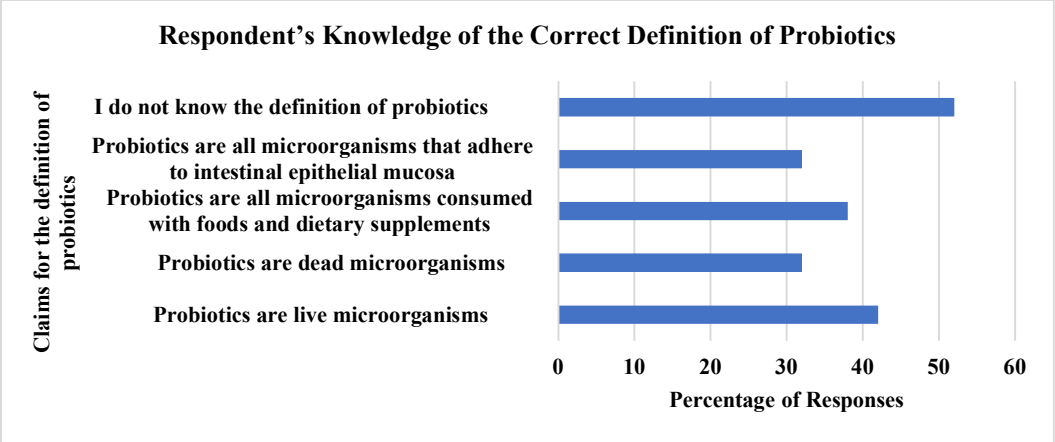

Figure 2: Respondent's Knowledge of the Correct Definition of Probiotics

3.3. Respondent's Knowledge of Microbial Species including Probiotic Strains

The next step was to ask respondents to select the microbe species they believed to have probiotic strains. *Escherichia coli, Lactobacillus rhamnosus, Bacillus subtilis, Enterococcus faecium*, and *Saccharomyces boulardii* were on the list, along with Lactobacillus acidophilus, *Bifidobacterium bifidum*, *Mycobacterium avium*, and *Bifidobacterium bifidum*. With the exception of Mycobacterium avium, every species described contains various probiotic strains. The most well-known probiotic species were *Lactobacillus acidophilus* (90%), *Bifidobacterium bifidum* (83%), and *Lactobacillus rhamnosus* (64%).

A little under a third of the respondents also selected *Enterococcus faecium* (30%) and *Saccharomyces boulardii* (25%), and although being less well-known, both species do include a number of probiotic strains. Twenty percent (25%) properly identified *Escherichia coli* as well. This bacteria has one well-known probiotic strain, *E. coli* Nissle 1917. *Mycobacterium avium* was the only species on the list lacking probiotic strains, and just 3% of respondents picked it correctly.

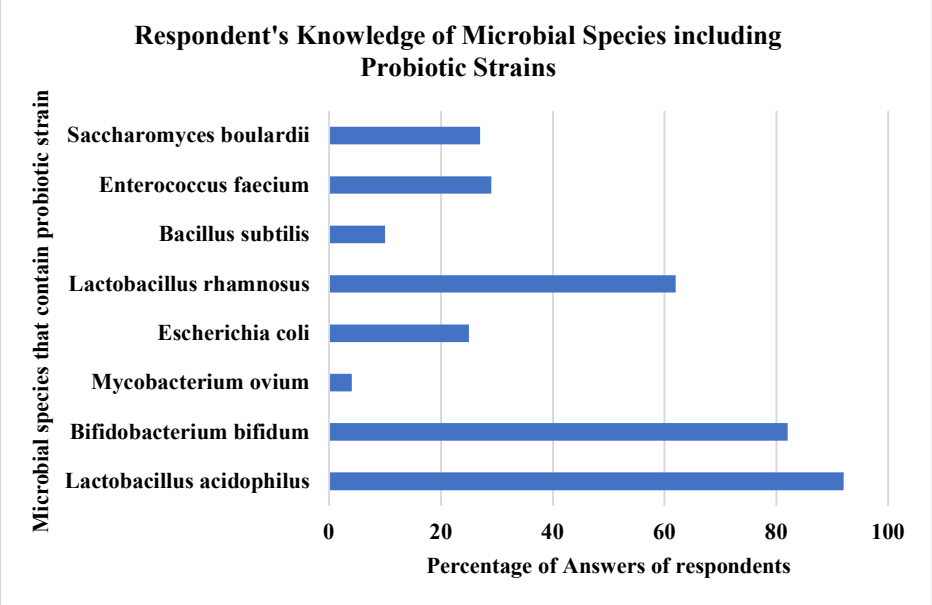

Figure 3: Respondent's knowledge of microbial species that possibly have probiotic strains

Additionally, there were significant differences in the respondents probiotic strain knowledge among the various categories of medical professionals **(Figure 2)**. The most well-known microbial species that has probiotic strains is *Lactobacillus acidophilus*, which is also known as a probiotic species.

3.4. Respondent's Knowledge of some of the Claims for Probiotics

The following claims were given to the respondents to mark as "true" or "false": Probiotics must be live microorganisms in tablets, powders, or capsules in order to be effective. Additionally, probiotics must be consumed for a long period of time in order to have a positive impact because they vanish from the gut after two weeks.

Probiotics are only beneficial in the form of tablets, powders, or capsules, according to less than one-quarter of respondents (25.5%). The majority of them (76.7%) correctly identified the need that probiotics be living bacteria. The majority of respondents (68.5%) believed that probiotics required to be taken orally for a long time in order to have a positive impact on health because they may vanish from the stomach after two weeks.

Probiotics should be taken before meals, according to nearly two thirds of respondents (62%) to the survey. Although this subject is still up for debate, this claim was highlighted as accurate in accordance with, wherein the highest probiotic survival was discovered when they were administered before a meal. The knowledge based on each statement varied greatly. The majority of respondents were aware that probiotics were not just available in tablets, powders, and capsules. The majority of respondents were aware that in order to maximize the health benefits of probiotics, long-term consumption is required. The knowledge of the ideal time to take probiotics varied greatly.

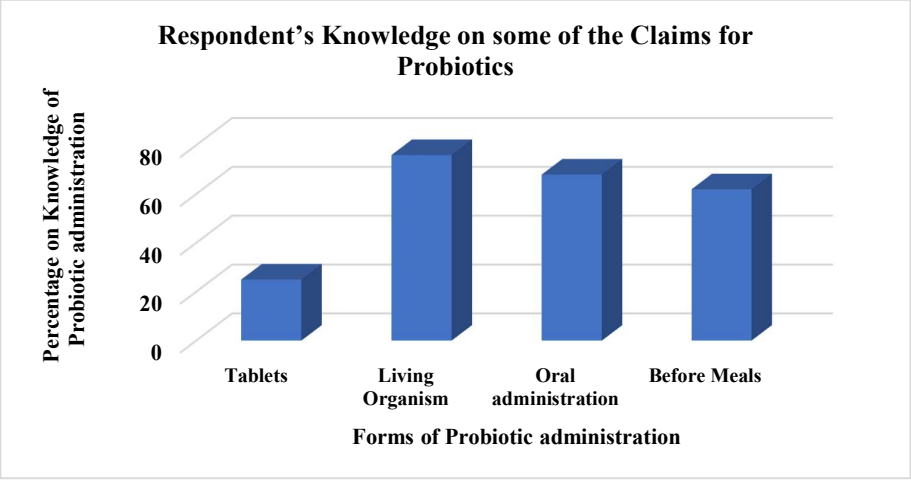

Figure 4: Respondent'sKnowledge of some of the Claims for Probiotics

3.5. Reasons for Taking Probiotics

90.2% of respondents said taking probiotics while taking antibiotics had advantages. Most people agreed that probiotics should be used before traveling overseas (63.3%), for constipation (70.6%), and in cases of diarrhoea (53.5%). The majority (60.4%) also thought probiotics were helpful for treating allergies. Additionally, more than half of the respondents believed that probiotics would be beneficial for those who suffer from depression or other mood disorders. Less than 50% of respondents thought probiotics might treat hay fever, cancer, and liver diseases.

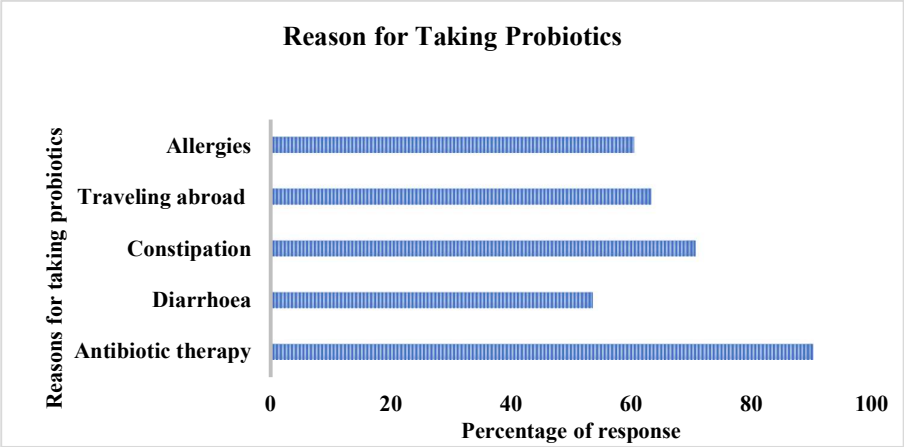

Figure 5: Reasons for Taking Probiotics

3.6. Sources of Information on Probiotics

Probiotic knowledge was obtained by respondents from a variety of sources, including books or specialized periodicals (43.3%), websites (32.9%), their places of employment (28%), pharmacies (25%), and radio or television (9.7%).

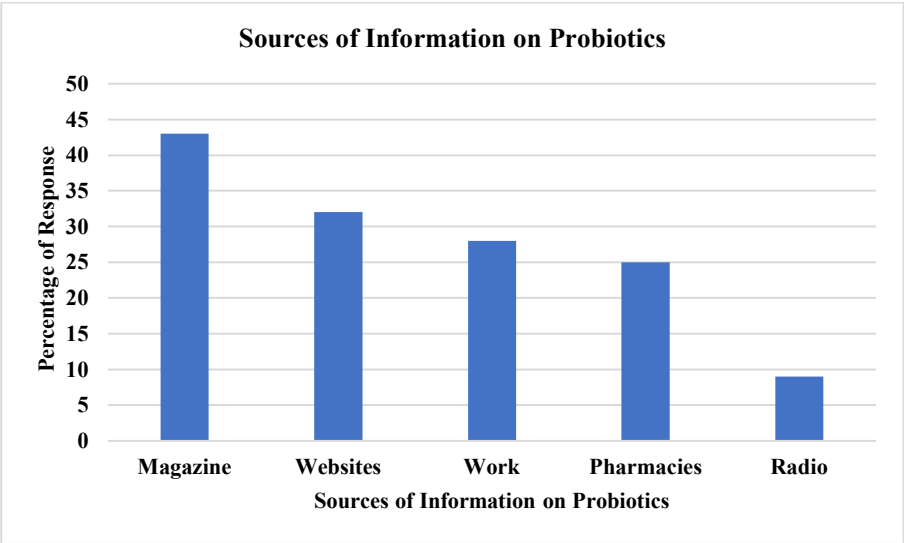

Figure 6: Sources of information of probiotics

Here, we offer a cross-sectional analysis of popular awareness and attitudes toward probiotics. More people clicked on the survey than actually filled out the questionnaire (n = 800), by a significant margin. This may have been due to the fact that few respondents felt they had sufficient knowledge to respond appropriately to the survey questions, or it could have been that some respondents disagreed with the questions; as a result, it would be much more likely for someone with knowledge of probiotics to respond than someone with little to no knowledge.

Due to anonymity, we had no information as to who was responding to the survey. Additionally, there was a disconnection between the people's perception of how good their knowledge of probiotics was and their ability to answer the questions correctly. As a result, our sampling was not statistically validated.

In our investigation, a statistically significant difference between the respondents' self-assessed probiotic knowledge and that of the general public, shown in **Figure 1**, was discovered. The majority of respondents to our study correctly identified the meaning of probiotics and demonstrated their understanding of the phrase, according to our research **(Figure 2)**. Although there is a substantial body of scientific evidence pointing to the advantages of probiotics, the variety of probiotic products and some strain-specific effects have made it challenging to make decisions on probiotics based on the available data **(Figure 3)**.

The majority of responders correctly identified the requirement that probiotics must contain living bacteria. However, few responders in the survey properly identified probiotics as natural plant products, and most wrongly identified them as manmade medications **(Figure 4)**. Implementing educational initiatives and promoting understanding and awareness about the use of probiotics are two ways to rectify these misconceptions. In order to reduce the negative effects of antibiotic use and to safeguard themselves against antibiotic resistance, different health practitioners should encourage patients to utilize probiotics more frequently than antibiotics to treat acute diarrhoea.

Because they don't realize that yoghurt, cultured milk, and fermented foods don't always contain probiotics, the general public is confused about them. On the other hand, some people think that probiotics only function when they are taken in the form of tablets, powders, or capsules. Because of the synergistic effects of food components and probiotics and because food improves the stability of ingested probiotics, many health professionals believe that eating meals containing probiotics is a better way to take probiotics than probiotic medications. The

main source of information to spread awareness among the use of probiotics need to be done by health care professionals which is lacking and was found out in our study **(Figure 6)**.

A growing body of scientific research supports the positive health effects of probiotic fermented dairy foods on a range of illnesses, including metabolic disorders, cancer, and gut disorders like irritable bowel syndrome, constipation, and diarrhoea as well as infections like antibiotic-associated diarrhoea **(Figure 5)**, Clostridium difficile, and Helicobacter pylori. Probiotic bacteria ability to produce antimicrobial compounds, competitive exclusion, and competition for vital nutrients are thought to be their main modes of action. The probiotic strains from the genera Bifidobacterium and Lactobacillus that are most frequently employed as probiotics are well known. Gram-positive Enterococcus faecium and gram-negative Escherichia coli were also recognized by several of the respondents. Saccharomyces boulardii, the only yeast species listed in our study that contains probiotic strains, was recognized by the surveyed health professionals in a lower percentage.

Probiotics should be taken before meals, according to the majority of responders (64%) to our survey. Probiotic supplements can be taken before meals, during meals, after meals, or even without meals, according to commercial literature on a variety of probiotic products. **(Figure 4)**. Both customers and health care experts are now perplexed as a result of this. As far as we are aware, only one scientific study has tackled this issue.

Our findings also indicate that because pharmacies provide free consultations, health professionals typically buy probiotics there for their own usage. Given that the majority of probiotic products are sold over-the-counter in their pharmacies and that they must stay current in order to be able to consult their patients, the pharmacists in our study displayed a high level of knowledge of probiotics, including the specific strains and their mechanisms of action.

4. CONCLUSION

People have started looking into alternatives to pharmaceutical drugs due to a number of issues, including rising antibiotic resistance among harmful bacteria and rising consumer demand for natural alternatives to medications. Certain probiotic strains are appealing as biotherapeutics as a result of the development of scientific and clinical evidence demonstrating their efficacy. Patients who are curious about probiotics may have trouble finding trustworthy information on what probiotics do and how they truly work. As a result, they may have questions when they visit their doctor's office. In order for patients to receive unbiased counsel from their general

practitioner, nurse, or pharmacist rather than dubious information from untrustworthy sources, it is crucial that health practitioners receive scientifically evidence-based guidance.

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