

Awareness of probiotics among dental practitioners of Puducherry—A cross-sectional questionnaire study

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Abstract

Background: The efficiency of probiotics in prevention and also treatment of oral infections including dental caries, periodontitis, halitosis is found to be appealing in the recent literature. Their antagonistic role in oral infections is mainly through formation of biofilm which needs documentation. Though the emergence and practice of oral probiotics is visualized for the past two decades, the consumption and knowledge level is found to be less among the community. Stronger source to spread scientific evidence to the community would be health professionals.

Aim: The current study is aimed at assessing the level of awareness of probiotics among dental practitioners of Puducherry thereby aid and assist in the beneficial practice of the same in the community.

Methods: The knowledge level was assessed through a cross sectional survey using closed ended questionnaire. Involves practicing dentists of Puducherry (n-173). A prevalidated questionnaire with 17 closed ended and one open ended question was employed as the research tool .

Results: The results revealed an acceptable knowledge in 77.4% and a greater level of knowledge in 20.8% of dentists. More number of studies are expected to fulfill the lacunae in the field of safety of usage and long term effects of probiotics.

Conclusion: Responses of the current study which was focused on dental practitioners revealed that the knowledge level is well above the acceptable level. There is no profound difference in the awareness level noticed among BDS and MDS practitioners..

Keywords: Awareness of dentists, oral probiotics, probiotics

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INTRODUCTION

Probiotics are defined as 'living microorganisms, principally bacteria, that are safe for human consumption and, when ingested in sufficient quantity, have a beneficial effect on

human health beyond basic nutrition' has been approved by the United Nations Food and Agriculture Organization and World Health Organization. They are also referred to as 'good bacteria' or 'supporting bacteria.'^[1,2]

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The idea behind probiotics emerged in the early 20th century. Nobel prize winner Ellie Metchnikoff was popularly referred to as the ‘father of probiotics’ proposed in *The Prolongation of Life*. Probiotic therapy is used in oral treatment after the emergence of antibiotic-resistant bacteria.^[3] As suggested by Dr Daniel Grenier, the mechanism of action of probiotics is related to their ability to compete with pathogenic microorganisms for adhesion sites.^[2]

Probiotics are available to consumers not only in the form of drugs like suppositories and creams but also in dietary supplements like milk, yoghurt, cheese, etc. The efficiency of probiotics in the prevention and treatment of oral infections, including dental caries, periodontitis, and halitosis, is found to be appealing through few studies.^[4] Their antagonistic role in oral infections is mainly through forming a biofilm, which has also been documented. The introduction of genetically modified microbes has given a newer facelift in the field of probiotics. The hub of modified microbes reduces the harmful properties of pathogenic strains among the commensals of the oral cavity. The modified strain beneficially would replace the original strain.^[5]

Probiotics generally refer to bacteria, yeasts, and moulds. The most common bacterial strains are of the genera *Lactobacillus acidophilus* and *Bifidobacterium*.

Saccharomyces boulardii is a yeast that satisfies the criteria of probiotics.^[6] *In vitro* studies have demonstrated the competency of the *Lactobacillus* strain over the *Streptococcus mutans* strain isolated from oral fluid. *L. rhamnosus*, *L. paracaesi*, and *L. plantarum* were the strains that proved their effect on decreasing the existence of the *Streptococcus* strain.^[7]

The *Bifidobacterium* strain targets the pathogenic strains by producing antimicrobial substances. *L. rhamnosus* strains modulate immunity by boosting the activity levels of natural killer cells and leukocytes. Natural killer cells identify and destroy tumour cells. *Lactobacilli* have an indirect effect on the killing of tumour cells. Studies conducted that went a duration of nine months to one year proved that when the probiotics were administered orally, they presented a great tolerance level and a better safety profile.^[8]

Despite the immense action of probiotics, data is still deficient on the role of probiotics in oral health. The concept of probiotics prompts a new horizon in the relationship between diet and oral health. Very few clinical

studies have been conducted till now. The current study is aimed at assessing the awareness of dental practitioners of Puducherry. Awareness of products like probiotics with more benefits would be the need of the hour. Since the inception of probiotics, their implications in dentistry have not been widely described. The outcome of this study would aid in attempting preliminary studies to find the effect of the same in the field of dentistry. Also, the accelerated growth in market and consumer focus and consumption has withdrawn scientific research on the safety and effectiveness of probiotics for specified health issues, including dentistry.

Aims and objectives

To evaluate the level of awareness of probiotics among dental practitioners of Puducherry, thereby aiding and assisting in the beneficial practice of the same in the community.

MATERIALS AND METHODS

Study area

The study was set in Puducherry with dental practitioners of Puducherry as the study population.

Study design

A cross-sectional questionnaire study was conducted among the dentists practising in Puducherry.

Sample size

Involves total population of dentists ($n = 173$), both Indian Dental Association (IDA) registrants and non-registrants. The previously proposed sampling method (convenient sampling: IDA list) was modified since more than half of the dentists were not IDA registrants. The dentists’ list of practising in Puducherry was generated by pooling both Indian Dental Association registrants and dentists’ list with the dental material dealers.

Type of study

A questionnaire with 17 closed-ended and one open-ended questions was designed to probe the basic aspects of probiotics based on the current literature. Validation of the questionnaire was done, and the content was validated by experts in the field of general microbiology, dietetics, and oral pathology. The suggestions were accepted positively and incorporated into the questionnaire. The study then proceeded after the approval of the proposal by the IRB & IEC of Indira Gandhi Institute of Dental Sciences, SBV University, Puducherry.

The study was conducted for a period of two months (August–September). With the help of the newly

generated list and after getting consent from the participants, the questionnaire was distributed to 173 participants, and the filled-in questionnaires were collected and organised.

Statistical analysis

Data analysis was carried out using SPSS software version 11. Frequency distribution was done, and results were interpreted in percentages.

RESULTS

Of the 173 dentists, 27% were BDS, and 73% were MDS. 75% of the $n = 173$ participants were practising above four years, and 25% were practising for less than four years. The scoring of the correct responses was classified and made to fall within three class intervals 0–5 as poor, 6–11 as acceptable, and 12–17 as good. The responses for the 17 questions, irrespective of the degree, are given in Table 1. Figure 1 represents the knowledge level, where the

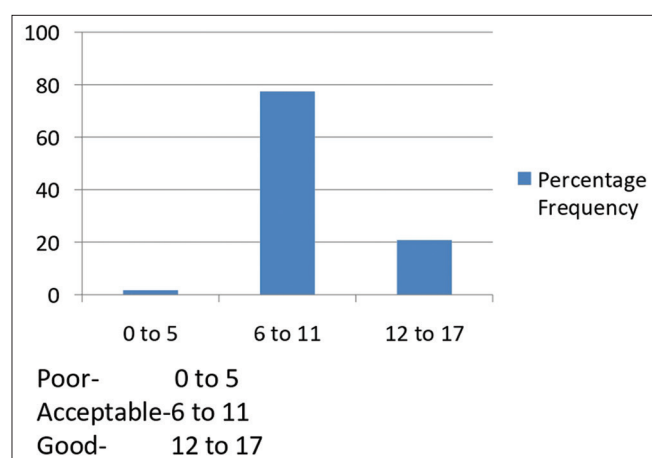


Figure 1: Knowledge of probiotics among dental practitioners

awareness was good in 20.8% of them, 77.4% of them had fallen into an acceptable category, and only 1.7% of them had poor knowledge about probiotics. Tables 2 and 3 show the awareness level of the BDS and MDS practitioners.

DISCUSSION

Living in harmony with nature improves the well-being of an individual. Naturally occurring products help in restoring good health. Such products are derived from sources like water, plants, animals, and microorganisms, categorised under the division complementary and alternative medicine. ‘Complementary and alternative medicine’ is a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period.^[1]

Complementary medicine includes probiotics, which are nothing but naturally occurring microorganisms, principally bacteria, and also yeasts and mould.^[2] It has been categorised as ‘generally regarded as safe’ by the United States Food and Drug Administration.^[3] A PubMed search revealed 13,138 number of literature published about probiotics from 1954 to 2015, of which 1,713 publications were on oral probiotics from 1991 to 2015. Despite accumulating evidence in connection to probiotics, the product is still less successfully integrated in practice. Healthcare providers are the effective source in the delivery of scientific evidence to the benefit of consumers. The current study is aimed to gauge the level of awareness of probiotics among dental practitioners.

Our questionnaire was constructed to judge the familiarity and knowledge of effective strains, dosage, availability, and

Table 1: Distribution of responses to questions related to knowledge, safety, and availability of probiotics

Questions	Responses in %
1. Microorganisms are	88.4%
2. Live microorganisms found naturally in the human body that are beneficial to health refer to	73.4%
3. Probiotics include the following:	56.1%
4. The following microorganism is a probiotic	78.0%
5. Probiotics are available only in the form of food products.	53.8%
6. Probiotics also relate to genetically engineered microbial strains.	46.8%
7. Probiotics are not effective beyond the given shelf life.	53.8%
8. It is always safe to administer probiotics.	38.2%
9. Following are the criteria for a probiotic to be termed a successful, effective strain except-	49.7%
10. Breast milk contains probiotics	72.3%
11. Probiotics are effective only if they are administered in adequate numbers.	64.2%
12. Probiotic strains, when administered in groups, act synergistically, and there is no independent action.	29.5%
13. Probiotics should be administered only in life forms.	18.5%
14. Probiotics can be effectively used in the replacement therapy of bacterial diseases of the oral cavity.	34.7%
15. Regular consumption of probiotics enhances innate and acquired immunity, thereby being effective in recurrent aphthous ulcers.	57.8%
16. Probiotics effectively reduce the risk and duration of antibiotic-associated diarrhoea.	73.4%
17. Fermented milk drinks, yoghurt, and cheese serve effectively as a buffering medium and aids in the reduction of colonisation of cariogenic pathogens.	69.9%

Table 2: Scoring of BDS practitioners' responses in %

Class interval	Frequency	Percentage frequency
0-5	1	2.1%
6-10	32	68%
11-15	14	29.7%

Table 3: Scoring of MDS practitioners' responses in %

Class interval	Frequency	Percentage frequency
0-5	2	1.5%
6-10	85	67.6%
11-15	39	30.9%

their long-term effects. The responses are given in Table 1. Our study revealed an acceptable level of awareness in 77.4%, and 20.8% had a good level of knowledge. A similar survey was conducted in Chennai with $n = 300$ involving dentists, medical professionals, and health care providers to analyse the knowledge of probiotics, wherein 69% of the participants were aware of the terms and their contents.^[9]

An identical study was conducted in Iran with 296 participants, where the level of awareness was acceptable at 43% and good at 51%.^[10] In par with ours a survey conducted in Canada among 62 Nigerian physicians, only 4.8% were familiar with the term, and none of them 0% have ever recommended probiotics.^[11] Comparable to ours, a survey was conducted in New Delhi, India, among 300 chemist shops, where only 10% of the shops had 75% of the probiotic products. The author concludes by saying this status is due to the lack of awareness among the chemists regarding the product.^[12] Correspondingly, a survey conducted among 33 caregivers in South Africa displayed the critical level of knowledge acquired by caregivers from sources other than healthcare providers.^[13]

Another study conducted in Alberta, Canada, among 413 mothers revealed that 99.3% had heard of probiotics, and 87% were aware that they contained live bacteria. Despite a better level of awareness, the respondents were not sure about the safety of the products on their infants (36.6%).^[14] A cross-sectional study conducted in Iran was closely associated with our study, where 332 students were the knowledge, attitude, and practice of food labelling was evaluated. 89.2% of the students agreed with the fact that appropriate labelling had a greater effect on the awareness of the food product.^[15]

A study was conducted in Pennsylvania, USA, among 162 patients who visited the community department. The patients were assessed for their knowledge and usage of probiotics as supplements. 65% of them were aware, and 29.9% of them were taking probiotics as supplements. 59% of them had not reported their regular consumption of

probiotics to their health care providers.^[16] The quality and efficacy of probiotics rely on the strain and the number of live bacteria. A daily dosage of a minimum of '10 billion colony-forming units (CFU)' is recommended. Fourteen billion CFU is more favourable.^[8]

Literature suggests that probiotics can be used in association with antibiotics, in the case of antibiotic-resistant bacteria, tolerated to a better extent in the place of critically ill individuals associated with nosocomial infections, pneumonia etc.^[17] Probiotics adhere well with the oral epithelial, rendering localisation of the microorganisms for a longer duration. This mechanism in oral tissues advocates the application of probiotics in treating dental caries, periodontal diseases, and halitosis.^[18]

CONCLUSION

Responses of the current study, which was focused on dental practitioners, revealed that the knowledge level is well above the acceptable level. There is no profound difference in the awareness level noticed among BDS and MDS practitioners. Much more studies in the field of probiotics are the need of the hour to ascertain its benefits and to spell out the safety issues. Combination therapies with antibiotics and prebiotics would be contenting, and more randomised control trials in connection to them are invited.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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