International Journal of Community Medicine and Public Health
Mahalaxmi HS et al. Int J Community Med Public Health. 2025 Jan;12(1):353-359
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20244043

Original Research Article

Knowledge, attitude, and practice related to oral health among undergraduate Ayurvedic students in Davangere city: a cross-sectional survey

Puja C. Yavagal*, Mahalaxmi H. S., Sapna B., Sushma G. Maruthi, Vinitha D. N., Sneha Paramashetti

Department of Public Health Dentistry, Bapuji Dental College and Hospital, Davanagere, Karnataka, India

Received: 06 December 2024
Revised: 13 December 2024
Accepted: 17 December 2024

***Correspondence:**
Dr. Puja C. Yavagal,
E-mail: pujacyavagal@gmail.com

ABSTRACT

Background: To assess the knowledge, attitude, and practice related to oral health among undergraduate Ayurvedic students in Davangere city.
Methods: A cross-sectional questionnaire survey was conducted involving 584 Ayurvedic undergraduate students from three Ayurvedic colleges in Davangere city. A 25-item pre-validated questionnaire was used to assess the knowledge, attitude, and practice related to oral health. Responses to knowledge scores were assigned weights and summed up to obtain total knowledge scores which ranged between 0-23, and categorized as good (0-7.6), fair (7.7-15.2), and poor (15.3-23). Statistical analyses: Responses were expressed in percentages. Man-Whitney U test, Kruskal Wallis ANOVA, and Pearson's/Spearman correlation tests were used for data analysis by setting the significance level at $p<0.05$.
Results: The response rate was 83.4%. The mean age of study participants was 21.30±1.62 years. The majority were females (67%). The mean knowledge score was 12.9±3.37 which reflected fair oral health-related knowledge which on comparison was similar across different sex ($p=0.14$) and year of study ($p=0.82$). There was no correlation between knowledge scores and age ($r=0.14$, $p=0.74$) or sex ($r=0.06$, $p=0.14$). The majority (>90%) felt the need for collaboration with dentists and up gradation of the oral health care section in the Ayurvedic curriculum.
Conclusions: The knowledge, attitude, and practices related to oral health care was fair among Ayurvedic students in Davangere city.

Keywords: Attitude, Ayurveda, Knowledge, Oral health, Practice, Survey

INTRODUCTION

Ayurveda is a holistic yet profound system of medicine that was conceived in India around 5000 years ago, and it was initially practiced in Tamil-speaking areas of South India.[1] A system of traditional medicine inherent to the Indian subcontinent is now practiced in other parts of the world as a form of complementary medicine. The most primitive literature on this Indian medical practice, Sushruta Samhita and the Charaka Samhita appeared during the Vedic period. Even though dentistry was not a specialized branch of Ayurveda, it was included in Shalakya Tantra (a Branch of Ayurveda concerned with all the disorders occurring above the shoulders).[2] In ancient India, certain oral health problems could be managed and even cured with traditional medicine. However, within Ayurveda, the current practitioners do not have management protocols for aesthetic corrections or conservative management of dental problems. [3-4] Oral health is an integral part of general health. Poor oral

health reflects social inequalities; hence the prevention of oral diseases should be a priority in developed and underdeveloped countries around the world. India is a large country with a mixture of various cultures and traditions. With an exponentially growing vast population and a huge amount of disease burden including dental caries and periodontal disease, oral health care delivery cannot be limited to dentist's alone.[5]

Majority of population prefer complementary medicine. All the indigenous medicine practitioners can play a vital part in oral health care delivery. Proper knowledge of oral diseases is crucial in their practice due to the following reasons: (a) Oral diseases are associated with multiple systemic conditions, (b) a large number of systemic diseases have oral manifestations, and (c) many drugs are associated with oral adverse drug reactions. It is imperative for dental health professionals to collaborate with complementary medicine practitioners like Ayurveda to provide dental care services as holistic management of oral problems is the need of the hour. Creating awareness about this during the early years of Ayurvedic learning among undergraduate students will help develop a collaborative temperament among Ayurvedic practitioners. In order to do this, it is important to assess the baseline knowledge attitudes, and awareness about oral health among them. The involvement of Ayurveda practitioners in improving the oral health of the population depends on their own knowledge about oral disease and its effects on general health, their attitude towards dental care, and their routine practice to maintain oral health. Because of the lack of research in this area, a cross-sectional questionnaire survey is planned among Ayurvedic students to assess their knowledge, attitude, and practice related to oral health in Davangere city.

METHODS

Study design was descriptive, Cross-Sectional questionnaire Survey done at the premises of Ayurvedic colleges. The study was conducted between February 2024 to May 2024. All Ayurvedic undergraduate students (BAMS) studying in three Ayurvedic colleges of Davanagere City comprised the study population which was approximately 700 students. All undergraduate students pursuing Bachelor of Ayurvedic Medicine (BAMS) (1^{st},2^{nd},3^{rd}, 4th-year students and interns) belonging to three Ayurvedic colleges in Davanagere viz; Tapovana Ayurvedic Medical College and Hospital, Ashwini Ayurvedic medical college and Sushrutha Institute of Ayurveda Medical Sciences & Research Centre were invited to take part in the study. Undergraduate students pursuing degrees other than BAMS, postgraduate students of Ayurveda, teaching staff of Ayurveda and Ayurvedic practitioners were not included in the study. Ethical approval was obtained from the Institutional Ethical Review Board. Permission to conduct the study was obtained from the Principals of Ayurvedic and dental college involved in the study. Voluntary informed consent was obtained from the study participants after explaining to them the purpose of conducting the study and the procedure of collecting the data through participant information letters.

Description of the proforma used for data collection

Data was collected using self-administered pre-tested proforma containing both open and closed-ended questions.The first section had the provision to record demographic characteristics like name, age, sex address, contact number, year of study of BAMS. The second Section had a questionnaire to record knowledge, attitudes, and practices related to oral health among undergraduate Ayurvedic students

Questionnaire details

Data was collected using a pretested, pre-validated, self-administered questionnaire used previously in a study done by Yavagal et al.[6] The questionnaire was designed in the English language. Considering the three main constructs (knowledge, attitude, and practices), it was a 25-item questionnaire. The first 15 items were designed to assess the knowledge of the participants regarding oral health. Responses for items 1-13 are placed on a three-point Likert scale, and item numbers 14-15 are multiple-choice questions. The responses for items assessing knowledge were assigned scores. The scores for all items assessing knowledge were summed up which represented the knowledge score of the participant which ranged between scores 0-23, which was categorized into good knowledge (15.3-23), fair knowledge (7.7-15.2), and poor knowledge (0-7.6). The mean knowledge score was calculated. Five items (item numbers 16-20) assessed the attitudes of the participants regarding oral health the responses of which were on a three-point Likert scale and five multiple-choice questions (item numbers 21-25) were used to assess the practices related to oral health.

Validation of the questionnaire

The content validity of the questionnaire was previously tested in the study done by Yavagal et al.[6] The questionnaire was assessed for relevance, simplicity, clarity, and ambiguity. The content validity index (CVI) for relevance was 0.76, and clarity, simplicity, and ambiguity were 0.68, 0.82, and 0.72 respectively. All the components had a CVI score of more than 0.6 hence the questionnaire was validated.

Method of data collection

The questionnaire was distributed to the ayurvedic students in their respective departments where they will be posted after explaining the purpose of the survey. The questionnaire was distributed to them by the investigator. They were instructed not to discuss any answers with their friends. They were also instructed to approach the investigator if they had any doubts about the

questionnaire fill in the questionnaire and return it to the investigator within 30 minutes.

Statistical analyses

The data was compiled systematically in Microsoft Excel and subjected to statistical analysis using Statistical Package for Social Sciences software (SPSS version 21.0, IBM, NY, USA). Data (responses) pertaining to attitude and practices were represented in percentages. Data pertaining to knowledge was continuous data. Data did not follow normal distribution hence, non-parametric tests were applied for analysis. For comparison of knowledge scores between two independent groups Man Whitney U test was used and for comparison of knowledge scores between more than two independent groups One-way ANOVA or Kruskal Wallis test was used. Chi-square test was used to compare proportions between groups. Pearson's and Spearman's tests were used to find the correlation between variables.

RESULTS

Around 584 Ayurvedic students out of 700 registered students participated in the study accounting for a response rate of 83.5 %. The mean age of the participants was 21.3±1.62 years. Around 67% were female participants. The majority were first-year students (29.8 %) and the least were interns (10.8 %) (Table 1).

Around 94-98 % believed that oral health was related to general health and proper tooth brushing would prevent oral diseases, sticky sugars led to tooth decay. More than 50 % of participants responded that care of milk teeth was important, plaque led to dental decay and gum disease, fluoride prevented decay, alignment of teeth is done both for esthetic and functional purposes, deleterious habits in children led to facial and jaw growth issues, mouth guards prevented sports-related oral injuries, avulsed tooth could be replaced back in tooth sockets and soft drinks caused wearing of teeth. Less than 50 % of participants were aware that mothers could transfer decay-causing germs to their children, causes of oral cancer and gum disease led to systemic problems (Table 2). On comparison of knowledge scores, it was observed that the mean knowledge score of participants was 12.90±3.37 which reflected fair knowledge about oral health. There was no significant difference in the knowledge scores ($p>0.05$) among participants of different gender, college and study year of students (Table 3).

Table 1: Distribution of demographic characteristic of study participants.

Demographic characteristics	Number of participants (%)
Gender	
Male	193 (33)
Female	391 (67)
Age (Mean±SD) years	21.30±1.62
Year of study	
1st Year	174 (29.8)
2nd year	134 (22.9)
3rd year	113 (19.3)
4th year	100 (17.1)
Interns	63 (10.8)

Table 2: Distribution of responses related to oral health knowledge.

	Question	Agree	Disagree/don't know
1	Oral health is related to general health	549 (94)	35 (6)
2	Proper maintenance of milk teeth is as important as permanent teeth	429 (73.5)	155 (26.5)
3	Decay and gum disease are caused by plaque	353 (60.4)	231 (39.6)
4	By proper tooth brushing and flossing gum disease can be prevented	570 (97.6)	14 (2.4)
5	Fluoride prevents tooth decay	296 (50.7)	288 (49.3)
6	Germs that cause dental decay are transmitted by mother to child	36 (6.2)	548 (93.8)
7	Frequent consumption of sticky sweets lead to tooth decay	560 (95.9)	24 (4.1)
8	Alignment of teeth is done for aesthetic and functional purpose	324 (55.5)	260 (44.5)
9	Habits like mouth breathing, thumb sucking and nail biting among children can affect their facial and jaw growth	343 (58.7)	241 (41.3)
10	Mouth guards prevent sports-related injuries to oral structures	495 (84.8)	89 (15.2)
11	An tooth avulsed (come out of the socket) due to trauma can be replaced into the socket	343 (58.7)	241 (41.3)
12	Loss of teeth in old age can be prevented by proper maintenance of oral health	454 (77.7)	130 (22.3)
13	Soft drinks cause weakening of teeth	491 (84.1)	93 (15.9)
14	Following causes oral cancer		
	1. Tobacco	232 (39.7)	
	2. Pan chewing	69 (11.8)	
	3. Ill-fitting prosthesis	4 (0.7)	
	4. Sharp teeth	0 (0)	

Continued.

	Question	Agree	Disagree/don't know
	5. All of the above	251 (43)	
	6. Don't know	28 (4.8)	
15	Gum disease is linked with		
	1. Diabetes	129 (22.1)	
	2. Pregnancy	30 (5.1)	
	3. Preterm birth weight	0 (0)	
	4. Cardiac diseases	0 (0)	
	5. All of the above.	83 (14.2)	
	6. Don't know	342 (58.6)	

Table 3: Comparison of mean knowledge scores based on gender and year of study.

Gender	Mean knowledge score	Z test , p value
Males	12.61±3.35	-1.4,0.14
Female	13.04±3.37	
Comparison of mean knowledge scores between participants of different years of Ayurveda		
Year of study	Mean knowledge score	Kruskal Wallis ANOVA P value
1st Year	12.70±3.41	H=1.61 , p=0.80
2nd year	13.11±3.30	
3rd year	12.56±3.17	
4th year	13.19±3.58	
Interns	13.14±3.41	
Total	12.90±3.37	

Table 4: Distribution of responses related to attitude.

	Question	Yes	No	Don't know
1	Do you feel regular visits to the dentist for oral health check-ups is necessary?	466 (79.8)	111 (19)	7 (1.2)
2	Do you think oral healthcare can be an important part of Ayurvedic care?	562 (96.2)	14 (2.4)	8 (1.4)
3	Do you feel oral care is given less emphasis in your curriculum?	267 (45.7)	244 (41.8)	73 (12.5)
4	Do you feel oral health should be updated and expanded in Ayurvedic education?	554 (94.9)	22 (3.8)	8 (1.4)
5	Do you feel the need to collaborate with dentists to provide oral healthcare for patients?	556 (95.2)	20 (3.4)	8 (1.4)

Table 5: Distribution of responses related to practices.

Distribution of responses related to practices		Response (%)
1	How often do you visit your dentist?	
	Once in 6 months	118 (20.2)
	Once in a year	25 (4.3)
	Whenever there is a problem	369 (63.2)
	Never visited	72 (12.3)
2	Do you refer your patients to the dentist when necessary?	
	Yes	543 (93)
	No	15 (2.6)
	Sometimes	26 (4.5)
3	How many times you brush your teeth in a day?	
	Once	209 (35.8)
	Twice	338 (57.9)
	More than twice	37 (63)
4	What do you use to clean your teeth?	
	Toothbrush and toothpaste	561 (96.1)
	Toothbrush and tooth powder	12 (2.1)

Continued.

Distribution of responses related to practices		Response (%)
	Any other	11 (1.9)
5	Do you have the habit of mouth rinsing?	
	Yes	516 (88.4)
	No	28 (4.8)
	Sometimes	40 (6.8)

Table 6: Correlation of knowledge score with sex, age and year of study of participants.

Correlation of knowledge score (r) Pearson/spearman's	Sex	Age	Year of study
	1	-0.14	0.02
P value	0.14	0.74	0.60

Majority of participants (>95%) felt oral health care was an important part of Ayurvedic care. They felt the need for an oral health-based curriculum and felt the need for the collaboration of Ayurvedic practitioners with dentists in providing oral health care (Table 4). Majority visited the dentist only when they had oral problems (63.2%) and referred them to dentists, when necessary (93%), brushed more than twice a day (63%) used a toothbrush and paste to clean their teeth (96.1%) and had the habit of mouth rinsing (88.4%) (Table 5). It was observed that the knowledge score was not significantly correlated ($p>0.05$) with the gender, age, and year of study of participants (Table 6).

DISCUSSION

Results indicated that the knowledge related to oral health was fair among Ayurvedic students in Davanagere city. Similar results were observed in studies done by Dayakar et al, and Khairnar et al in Dakshina Kannada and Dhule City respectively where it was observed that the Ayurvedic students had good knowledge about oral health and preventive dentistry.[1,7] The majority of Ayurvedic students considered that oral health was related to general health. Similar responses were observed in the study done by Dayakar et al, and Raghavendra et al, John et al, and Rajmohan et al.[1,8,9,5] In a study done by Raghavendra et al, ayurvedic students were aware of the fact that periodontal diseases effected general health.[8] In the present study, the maintenance of deciduous teeth was considered to be an important part of oral health care. Similar responses were seen in the study by Khairnar et al, proper tooth brushing and flossing were considered a major preventive measure for the majority of oral diseases by participants in the present study.[7] Similar responses were observed among Ayurvedic students and practitioners in a few studies done by Dayakar et al, Kairnar et al, Raghavendra et al, Chatterjee et al, Shrestha et al, Hrishikesh et al, and Sharada et al.[1,7,8,10-13] Few participants were aware about the caries preventive effect of fluorides and pit and fissure sealants in the present study. A similar result was seen in a few studies.[6,7] However, a study done by Kairnar et al, and Sharada et al, reflected poor preventive dental health knowledge among Ayurvedic students.[7,13] Many participants were aware about the harmful effects of tobacco and the causes of oral cancer in the present study. Similar results were observed in a few studies.[10,11,13] However, in a study by Kulkarni et al, very few Ayurveda practitioners examined oral mucosa and did not have sufficient knowledge about oral cancer.[14] Many Ayurvedic students and practitioners brushed their teeth twice daily and had the habit of mouth rinsing and changing their toothbrush once in 3 months. Similar results were observed in a few studies.[7-8,11-13] However, few of the Ayurvedic students and practitioners were not aware of the importance of changing toothbrushes every 3 months, flossing, and regular dental check-ups.[1,7,8] Majority of participants referred the patients to dentists for oral health care in the present study. Similar results were seen in a few studies.[5,11-12] However, in a study by Aniyan et al., Ayurvedic practitioners ignored referral to a dentist in minor dental cases.[15] Many participants in the present study felt the need for the collaboration of Ayurvedic practitioners and dentists in providing dental care. Similar responses were observed in a few studies.[5,8,10] In the present study many Ayurvedic students felt the need for an oral health-based curriculum. Similar responses were observed in a few studies.[5, 9,15]

Ayurvedic students would benefit from increasing their oral health awareness and timely referral for oral health care can be put into place. Also, a collaborative treatment style can be evolved upon. Similarly, professional advancement programs of the two diverse medicine practices, that is contemporary dentistry and Ayurveda could aid in bridging the gap and enable mutual inculcation of beneficiary therapeutic modalities. The heady mix of the quickness of contemporary practice with the organic approach of Ayurveda could unveil a myriad of possibilities for effective disease control.[16] Also, hands-on training of the Ayurvedic students in the detailed oral examination is another direction to follow upon.[17] This would aid in prompt referrals to dentists for conservative disease management and thus accelerated treatment services within the realms of contemporary dental practice as well as nipping many systemic and localized diseases in the bud.[18,19] Oral health promotion seeks to improve and protect health through various complementary strategies. Positive attitudes toward

health promotion and preventive dentistry among health science students are to all intents and purposes highly desirable.[20,21] The ancient knowledge and modern dentistry could be integrated to cater better services to the patients at a much more affordable and accessible rate and improve the quality of life of the patients as a whole which is the supreme goal of both the health systems. The study had few limitations. Since, it involved Ayurvedic colleges only from Davanagere city the results cannot be generalized to other population. Social desirability bias cannot be ignored since it was a questionnaire-based survey. Study did not consider assessing oral health status and self-perceived oral health of Ayurvedic students which could have been correlated with their oral health related knowledge and practices.

CONCLUSION

Oral health related knowledge was fair among ayurvedic students in Davanagere city which was similar across gender and year of study of students. Majority of participants felt oral health care was an important part of Ayurvedic care and felt the need for an oral health-based curriculum and collaboration of Ayurvedic practitioners with dentists in providing oral health care.

ACKNOWLEDGEMENTS

We would like to thank the Principals and students of Tapovana Ayurvedic Medical College and Hospital, Ashwini Ayurvedic Medical College and Sushrutha Institute of Ayurveda Medical Sciences & Research Centre in Davanagere, for their participation in research and support.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Review Board of Bapuji Dental College and Hospital, Davangere. (Ref No: ECR/1652/Inst/KA/2022/24/08-004)

REFERENCES

1. Dayakar MM, Kumar J, Pai GP, Shivananda H, Rekha R. A survey about awareness of periodontal health among the students of professional colleges in Dakshina Kannada District. J Indian Soc Periodontol. 2016;20(1):67-71.
2. Bopp ML. The Surgeon General's report on oral health dental hygiene: you can depend on us. J Dent Hyg. 2001;75(4):263.
3. Jaiswal Y, Williams LL. A glimpse of Ayurveda-The forgotten history and principles of Indian traditional medicine. J Tradit Complement Med. 2016;7(1):50-3.
4. Pravin M, Ade V, Dharmarajan P, Ranajan MA. Critical analysis of dentation and dental care in Ayurveda. J Homeop Ayurv Med. 2015;4:175-8.
5. Rajmohan M, Madankumar PD, Shivakumar M, Uma KS. Awareness on Oral Health among Ayurvedha and Siddha Practitioners in Chennai, Tamil Nadu–A Questionairre Study. Medi J Islamic World Acad Sci. 2012;20(2):43-8.
6. Yavagal PC, Dalvi TM, Benson T, Lakshmi S, Yann THW, Gowda T. Knowledge, Attitude and Practices Related to Oral Health Among Nursing Students in Davangere City: A Cross-Sectional Survey. Oral Health Prev Dent. 2020;18(1):493-8.
7. Khairnar MR, Dodamani AS, Karibasappa GN, Naik RG, Deshmukh MA. Knowledge, attitude and behavior towards preventive dentistry among health care students in Dhule city. Nursing. 2015;25(20.9):1-8
8. Raghavendra U, Kumar V, Rao A, Kashyap RS, Rao SM, Boloor V, Patil S. Knowledge and practice regarding periodontal health/disease and oral hygiene among medical, ayurveda and homeopathy undergraduate students of yenepoya university, Mangalore--a cross sectional study. J Evolut Med Dent Sci. 2021;10(27):1996-2001.
9. Smith J, Jithesh Jain AS, Sadhu BJ. Attitude and practices towards dental diseases among Ayurveda, homeopathy and naturopathy interns, post graduates and faculty. IJADS. 2019;5(2):37-44
10. Chatterjee S, Khan AM, Reshma VJ, Muhamood M, Moothedath M, Rao K, et al. Knowledge, Opinion, and Practices Towards Screening of Oral Cancer Among Homeopathy and Ayurveda Students in Indore, Madhya Pradesh, India. Cureus. 2023;15(3):1-8.
11. Shrestha R, Shrestha S, Shah B, Pradhan S, Bhochhibhoya A. Awareness on oral hygiene among Ayurveda practitioners. The Healer. 2021;2(02):09-14.
12. Hrishikesh KP, Paul J, D'lima JP, Parackal ST, Thomas D, George RS. Assessment of the awareness of periodontal diseases and oral hygiene practice among various healthcare professionals: A cross sectional study. IP Int J Periodontol Implantol. 2020;5(4):149-53.
13. Sharda AJ, Shetty S. A comparative study of oral health knowledge, attitude and behaviour of non-medical, para-medical and medical students in Udaipur city, Rajasthan, India. Int J Dent Hyg. 2010;8(2):101-9.
14. Kulkarni RS, Arun PD, Rai R, Kanth VS, Sargaiyan V, Kandasamy S. Awareness and practice concerning oral cancer among Ayurveda and Homeopathy practitioners in Davangere District: A speciality-wise analysis. J Natur Sci Biol Medi. 2015;6(1):116-20.
15. Aniyan KY, Patil K, Guledgud MV. Assessment of knowledge, attitude, and practice of oral disease management among doctors practicing the ayurveda system of medicine: a questionnaire-based study guide to unconventional dentistry. J Ind Acad Oral Med Radiol. 2023;35(2):222-5.

16. Amruthesh S. Dentistry and Ayurveda IV: Classification and management of common oral diseases. Indian J Dent Res. 2008;19(1):52-61.
17. Torwane NA, Hongal S, Goel P, Chandrashekar BR. Role of Ayurveda in management of oral health. Pharmacogn Rev. 2014;8(15):16-21.
18. Bhardwaj VK. Ayurveda and holistic approach in oro-dental care: An overview. SRM. 2015;6(3):181-6.
19. Shrivastava MM, Gupta PK, Shah K, Chauhan DN, Chauhan NS. Ayurvedic Approaches to Oral Health and Hygiene: A Review. Pharmacological Studies in Natural Oral Care. 2023:1-31.
20. Thakur N, Bagewadi A, Keluskar V. Holistic dentistry: Natural approaches to oral health. J Int Oral Health. 2011;3:9-13.
21. Anushri M, Yashoda R, Puranik MP. Herbs: A good alternatives to current treatments for oral health problems. Dermatitis. 2015;7:9-12.

Cite this article as: Yavagal PC, Mahalaxmi HS, Sapna B, Maruthi SG, Vinitha DN, Paramashetti S. Knowledge, attitude, and practice related to oral health among undergraduate Ayurvedic students in Davangere city: a cross-sectional survey. Int J Community Med Public Health 2025;12:353-9.