






## RESEARCH ARTICLE

**REVISED** Attitudes toward and knowledge of collaboration of dental and medical practice among medical students in Southern India: a cross-sectional questionnaire survey [version 4; peer review: 1 approved, 2 approved with reservations]

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### Abstract

**Background:** Enhancing oral health care services provided through inter-professional collaboration between medical and dental practitioner is important, and even essential. The purpose of this study is to assess the attitude toward and knowledge of medical-dental collaborative practice among medical students attending colleges in Southern India.

**Methods:** A cross sectional questionnaire survey was conducted by inviting 900 medical students and interns of medical colleges in coastal South India with prior information and permission. The questionnaire consisted of 11 questions to assess attitude toward and knowledge of medical-dental collaborative practice and was distributed in pen & paper format to participants who agreed to take part in the study. Chi square test was employed for data analysis. The

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responses obtained were correlated with age, gender and year of study of participants using Pearson's correlation test

**Results:** Most of the students agreed that oral health was an integral part of systemic health, however participants disagreed on attending compulsory rotation in dentistry at a statistically significant level ( $p < 0.05$ ), moreover participants did not agree with physicians having an active role in motivating their patients for regular dental check-up. 82% of the medical students believe that dental check-up should be included in health packages under health insurance. A statistically significant ( $p < 0.05$ ) difference was observed among 3<sup>rd</sup> year & 4<sup>th</sup> year students and interns and also it was found that female students provided more positive responses towards medical-dental collaboration.



**Conclusions:** Even though medical students showed fairly positive attitudes and knowledge towards dentistry, the analysis within the study groups showed that knowledge and attitudes regarding the collaborative practice worsened over the academic years among the medical students.

### Keywords

Dental-Medical Collaboration, Attitude and knowledge, Medical students, Interprofessional practice



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**REVISED Amendments from Version 3**

The revisions done in the Version 4 of our Manuscript is based on the suggestions and queries by one of the reviewer comments. We hope this version brings more clarity regarding our work published. Conclusion of the study is revised and is concise as per the relevance to the study. More information regarding sample population and participation has been added in methodology section for more clarity. We acknowledge the reviewers' comments and would like to clarify that no students were forced to take part in the study. Questionnaires were distributed only to the participants to give consent to take part in the study and the responses were collected in pen and paper format.

Author name 'Harshit Atul Kumara' has been corrected to 'Harshit Atul Kumar'.

**Any further responses from the reviewers can be found at the end of the article**

**Introduction**

One of the commonly neglected health issues globally is oral health, and the impact of oral diseases has significant effects on individuals, communities and global health care systems.<sup>1</sup> The evolution of professional health care education over the years is yet to compete with the demographical challenges and inequalities faced, which causes a burden on the system to fight the disease spread, and utilize the scientific knowledge and advanced technology with increasing complexity in the system. In addition to this, there is existing gap in imparting training to medical professionals about importance of oral health and its impact on general health.<sup>2,3</sup>

In order to achieve greater resource efficiency and upgrade the standard of care and comprehensiveness by reducing duplication and gaps in services, interprofessional collaboration is a key to success.<sup>4</sup> All parties will benefit from improved professional cooperation between medical and dental practitioners and better educate the public. Overlooking underlying health problems while treating a patient is what most dentists do while they focus on the diagnosis and treatment of oral diseases. Likewise, doctors may fail to notice their patient's oral health problems which could result in initiation of a long-lasting medical illness. Enhancing health care services through inter-professional collaboration between medical and dental practitioners is therefore essential.<sup>5</sup> An article was published after the First Systemic Health Round Table Discussion to advocate for better medical-dental collaborative practice. Inter-professional collaboration enhances communication and decision-making, enabling a synergistic influence of grouped knowledge and skills.<sup>6</sup> Due to limited literature and emphasis on this topic, we decided to conduct this study to improve the understanding and importance of the same.

As per the medical education curriculum in India, medical students have to attend compulsory rotation-ship of about one month in a dental clinic/hospital, which by far many medical colleges follow it routinely. Hence the purpose of this study is to evaluate the knowledge and attitudes of the medical students studying in medical college attached to a dental college, towards collaboration between medical and dental practice in South India to understand the shortcomings and address them with a better strategy.

**Methods****Ethical approval**

Approval was obtained from the Institutional ethics committee (IEC) with protocol reference number-17020, from Manipal College of Dental Sciences, Mangalore. Necessary permissions and the written consent of participants were obtained and all methods were in accordance with relevant guidelines and regulations for carrying out the survey.

**Study and questionnaire design**

The questions in the questionnaire survey were adapted from the previously published studies and modified as per requirement for this study.<sup>6,7</sup> The questionnaire was pretested in pen and paper format(physical format) on a group of 20 medical students selected based on our inclusion and exclusion criteria and the participants were given brief explanation about the study and the feedback was collected. Based on the feedback from participants, minor corrections were incorporated in the questionnaire and updated questionnaire was used in the main study. This cross-sectional study was carried out among the 3<sup>rd</sup> year, 4<sup>th</sup> year students and interns (5<sup>th</sup> year) of four medical colleges with an attached dental college in and around Mangalore, a coastal urban area in the south Indian state of Karnataka. A total of 900 medical students were invited to participate in the study from all the medical colleges, out of which 250 students consented to participation to fill the questionnaire in the pen and paper format (physical format). From 250 responses, 234 questionnaires were appropriately completed and 16 responses were excluded as they submitted incompletely filled questionnaires. Dental students were not considered to be included in the study because the dental curriculum is designed such that dental students has a good exposure to medical college departments throughout the entire course with mandatory clinical postings and University examination when compared to medical students who only have a month of posting in dental college as required by medical curriculum.

**Inclusion criteria:**

1. Undergraduate Medical Student studying in 3<sup>rd</sup>, 4<sup>th</sup> or 5<sup>th</sup> year of the college.
2. Students who consent to participate in the survey

**Exclusion criteria:**

1. Medical student studying in 1<sup>st</sup> or 2<sup>nd</sup> year of the college
2. Students belonging to paramedical course in the same college
3. Post graduate medical students

The questionnaire was subjected to face and content validation by both a medical and dental faculty member for its comprehensiveness and simplicity of understanding and each question was tested for content validity.

After obtaining the written consent from the participants, questionnaire to be filled were distributed among the participants. The questionnaire had 2 components: the first component was to collect the demographic data such as age (below 20 years of age, 21-24 years, above 20 years of age), gender (male and female) and year of study (3<sup>rd</sup> year, 4<sup>th</sup> year, interns) and the second component contained 11 objective questions which were designed to assess their attitude and knowledge. Questionnaire responses were recoded using 5-point Likert scale (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree).

**Score calculation and interpretation**

For the study to be statistically valid and comprehensible, we calculated the mean response score for each question Shapiro wilk test will be used to the test the normality. If the data is skewed, median and inter quartile range will be used for analysis.

The collected data were coded and analysed using statistical package of social sciences (SPSS) version 11.5. Results were expressed as proportion and summary measures (median with inter quartile range) using appropriate tables and figures. For comparison across the groups Mann Whitney U test was employed. A p value of 0.05 was considered statistically significant.

**Results**

A total of 900 students were invited to participate in the study, out of which 250 students consented to participate, which amounts to 27.7% of response rate. Although the response rate was less than expected, the statistically calculated required sample size of minimum 180 responses was completed.

Reliability analysis was done using Cronbach's alpha and it was found to be 0.769 with no improvement in alpha on deletion of any item in the questionnaire.

Those who returned a blank or incomplete questionnaire were excluded. The mean age of the participants was 21.5 years with 58.36% respondents being female and 41.64% male. Out of total respondents, 43.77% were 3<sup>rd</sup> years, 39.9% were 4<sup>th</sup> years and rest (17%) accounted for interns. Shapiro wilk test for normality was performed and the data was found to be skewed (p value < 0.001). Thus, statistical analysis was performed using non parametric tests.

There was no statistically significant difference in knowledge and attitude based on gender, except that the female students were significantly more (p value-0.00) aware of interprofessional referral practice before elective medical surgeries (Table 1). Overall analysis of gender-based difference in responses indicated that females are more well informed and have increased positive attitude than males regarding the intended collaboration.

Most of the students agreed that oral health was an integral part of systemic health with analysis leading to median score of 5 (Table 2), but a statistically significant difference in the attitudes of medical students based on study year was seen when asked about attending compulsory rotation in dentistry with senior students showing negative attitude. The majority of participants had adequate knowledge regarding the medical-dental relationship, but almost 47% had very limited awareness about the existing relationship, which was assessed by questions 2, 3, 4 and 5. While comparing the groups

**Table 1. Responses based on gender.**

Characteristic	Gender		Total Median (IQR)	p value
	Male (n=97) Median (IQR)	Female (n=137) Median (IQR)		
Oral health is an integral part of general health	5.0(4.0-5.0)	5.0(4.0-5.0)	5.0(4.0-5.0)	0.989
Periodontitis is the 6 <sup>th</sup> complication of diabetes	3.0(3.0-4.0)	4.0(3.0-4.0)	3.0(3.0-4.0)	0.402
Oral check-up for all woman in pre-natal care	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.093
HIV pt. with CD4 count > 200 cells/mm blood is suitable for dental treatment	3.0(3.0-4.0)	3.0(3.0-4.0)	3.0(3.0-4.0)	0.627
Salivary biomarkers used in diagnosis of oral and systemic diseases	4.0(3.5-4.0)	4.0	4.0	0.642
Physician should advise and motivate their patients to undergo dental check-up regularly	4.0(4.0-5.0)	5.0(4.0-5.0)	4.0(4.0-5.0)	0.117
Medical students should attend compulsory rotation in dentistry	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.716
Complete dental check-up should be covered in health insurance	4.0(3.0-5.0)	4.0(4.0-5.0)	4.0(4.0-5.0)	0.238
Referral for dental check-up before any elective surgeries	3.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.000*
Integral collaboration between medicine and dentistry	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.809
Interact with dental students and mutually exchange knowledge	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.997

\*p=0.05.

**Table 2. Responses based on study year.**

Characteristic	Study year			Total Median (IQR)	p value
	3 <sup>rd</sup>	4 <sup>th</sup>	Intern		
Oral health is an integral part of general health	5.0(4.0-5.0)	5.0(4.0-5.0)	5.0(4.0-5.0)	5.0(4.0-5.0)	0.382
Periodontitis is the 6 <sup>th</sup> complication of diabetes	4.0(3.0-4.0)	3.0(3.0-4.0)	3.0(3.0-4.0)	3.33(3.0-4.0)	0.341
Oral check-up for all woman in pre-natal care	4.0(3.0-4.0)	4.0(3.0-4.0)	3.0(3.0-4.0)	3.66(3.0-4.0)	0.140
HIV pt. with CD4 count > 200 cells/mm blood is suitable for dental treatment	3.0(3.0-4.0)	3.0(3.0-4.0)	3.0(3.04-4.0)	3.0(3.0-4.0)	0.652
Salivary biomarkers used in diagnosis of oral and systemic diseases	4.0(4.0-5.0)	4.0(3.0-4.0)	3.0(3.0-4.0)	3.66(3.0-5.0)	0.003*
Physician should advise and motivate their patients to undergo dental check-up regularly	5.0(4.0-5.0)	4.0(4.0-5.0)	4.0(4.0-5.0)	4.33(4.0-5.0)	0.013*
Medical students should attend compulsory rotation in dentistry	4.0(3.0-4.0)	3.0(2.0-4.0)	3.0(3.0-4.0)	3.33(2.0-4.0)	0.017*
Complete dental check-up should be covered in health insurance	4.0(4.0-5.0)	4.0(4.0-5.0)	5.0(4.0-5.0)	4.33(4.0-5.0)	0.665
Referral for dental check-up before any elective surgeries	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.656
Integral collaboration between medicine and dentistry	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.056
Interact with dental students and mutually exchange knowledge	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.084

\*p=0.05.

**Table 3. Responses based on age group.**

Characteristic	Age group			Total Median (IQR)	p value
	20 and below 20	21-24	Above 25		
Oral health is an integral part of general health	5.0	5.0(4.0-5.0)	5.0	5.0(4.0-5.0)	0.075
Periodontitis is the 6 <sup>th</sup> complication of diabetes	4.0(3.0-4.0)	3.0(3.0-4.0)	3.0(3.0-4.0)	3.33(3.0-4.0)	0.056
oral check-up for all women in pre-natal care	4.0(3.0-4.0)	4.0(3.0-4.0)	3.0(3.0-4.0)	3.66(3.0-4.0)	0.232
HIV pt. with CD4 count > 200 cells/mm blood is suitable for dental treatment	4.0(3.0-4.0)	3.0(3.0-4.0)	4.0(4.0-5.0)	3.66(3.0-5.0)	0.014*
Salivary biomarkers used in diagnosis of oral and systemic diseases	4.0	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.360
Physician should advise and motivate their patients to undergo dental check-up regularly	5.0(4.0-5.0)	4.0(4.0-5.0)	4.0(3.0-5.0)	4.33(3.0-5.0)	0.374
Medical students should attend compulsory rotation in dentistry	4.0(3.0-4.0)	3.0(2.0-4.0)	3.0(3.0-5.0)	3.33(2.0-5.0)	0.085
Complete dental check-up should be covered in health insurance	4.0(4.0-5.0)	4.0(4.0-5.0)	5.0(4.0-5.0)	4.33(4.0-5.0)	0.806
Referral for dental check-up before any elective surgeries	4.0(3.0-4.0)	4.0(3.0-4.0)	3.0(3.0-4.0)	3.66(3.0-4.0)	0.676
Integral collaboration between medicine and dentistry	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	0.191
Interact with dental students and mutually exchange knowledge	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	4.0(3.0-4.0)	1.000

\*p=0.05.

based on study year there was a statistically significant difference in knowledge (Table 2) with p value of 0.003, when asked about importance of salivary bio markers. Moreover when asked about physicians' active role in motivating their patients for regular dental check-up, there was a statistically significant difference (p value-0.013) in responses given by groups based on year of study indicating their negative attitude. However, 82% of the medical students were of the opinion that dental check-ups should be included in the health packages under health insurance.

Most students were aware about the necessity for interprofessional practice but only 61.8% agreed to the foster integral collaboration; 12.8% disagreed and the rest were unsure. Medical students (61%) gave a median score of 4, and agree that regular interaction is required with dental students to mutually exchange knowledge. Interestingly, 25% of them have replied neutrally, which again indicates a lack of interest with regards to the same.

A statistically significant difference based on age was seen (Table 3) with p value of 0.014 when asked about relation of HIV patient and dental treatment. Participants belonging to 21-25 years age groups showed lesser knowledge regarding the same.

## Discussion

This study was used to evaluate the knowledge and attitudes of medical students towards the collaboration of medical and dental practice. As per Zhang the dental students would be more aware collaborative efforts than medical field as dental students are exposed to medical colleges from 1<sup>st</sup> year to 3<sup>rd</sup> year of their curriculum, contrary to the medical students who spend only a month in dental college postings.

Overall, medical students showed fairly good knowledge and positive attitude towards medical and dental collaboration in congruence with the results obtained from the study by Zhang. But analysis of groups within each parameter showed a significant difference. Based on year of study, it was found that students from third and final years of study had more positive attitudes than the interns, unlike results obtained by Zhang.<sup>7</sup> More than half the participants, particularly the interns, did not agree to attend compulsory rotation in dentistry (p value 0.017), contrary to finding in which Hendricson and Cohen concluded this rotation-ship was not only beneficial but essential.<sup>8</sup>

Although nearly 50% participants had fair knowledge regarding the oral-systemic link, many participants were confused when asked if it was mandatory to undergo an oral check-up before pregnancy. Sufficient research has shown that severe periodontal disease in pregnant women predisposes them to a higher risk of delivering preterm and/or low-birth weight of the new born.<sup>9,10</sup> Offenbacher found mothers with periodontal disease are at a risk seven times more than mothers without.<sup>11</sup> When asked about a link between diabetes and oral health, students seemed to have limited knowledge regardless of year of study. In addition, previous investigations have established an association between either type 1 or type 2 diabetes and periodontal diseases to the extent that periodontitis has been called the "sixth complication of diabetes".<sup>12,13</sup> Interestingly, analysis among gender revealed a statistically significant difference with more knowledge among female participants with regard to questions about criteria to undergo treatment among HIV patients. Though it does not provide any supporting evidence to prove poor knowledge, it does indicate the need for further education among medical students about HIV patients and dental treatment.

While assessing the attitude of the students, we found significant data that junior students advised and motivated their patients to undergo dental check-up regularly, compared to senior students who gave a more of neutral response. One of the reasons for such an attitude from senior students can be because of the concept of social hierarchy which can be due to lack of interprofessional communication and patient management.<sup>4</sup>

In the United States, utilization of oral health care services and the incidence of oral disease are strongly linked to dental insurance coverage.<sup>14</sup> In contrast, in India the dental insurance sector is less prevalent, 40-50% of the medical students strongly feel that dental check-up and some part of treatment must be covered in general health packages.

Around 60% of participants responded positively towards the integral collaboration and interprofessional communication, although 30% students were not sure and the rest disagreed with it. Analysis showed that the third and final year students were more positive than interns which is in contrast to results obtained from a study by Zhang.<sup>7</sup> The exposure medical students undergo at clinics along with their interest in the subject affects their perception of oral health and its importance on general health. The Indian health education system, which often displays egocentric power relations among healthcare professionals, whereby medical professionals may not consider oral health as an integral part of general health due to a false perception, is threatening this interprofessional collaboration.<sup>15</sup>

Students' attitude is associated with factors such as gender, knowledge of regular dental check-up, and curriculum. Results of a previous study reported that gender could affect a student's attitude towards medical dental collaboration.<sup>9,16</sup> Questions pertaining to the attitude towards collaboration such as insurance benefits for dental treatments received a more positive response from females than males. When asked about importance of interprofessional communication for exchange of knowledge and better patient care, females gave a greater positive response than males, which can be attributed to higher ego among males.<sup>15</sup>

In clinical practice, interprofessional continuing education is a useful means of regulating and stabilizing a professional's identity and improving teamwork.<sup>4</sup> Guidelines must be set to improve confidence in a provider's ability with regard to cases pertaining to both fields and have access to updated knowledge about the collaboration between medical and dental practice.<sup>17,18</sup> The existing body of medical and dental professionals play an important role since they have the ability to lay the guidelines. They can set guidelines for the indications, timing, protocols, and responsibilities of referral and consultation among physicians and dentists. Patients and the community should be made to understand the relationship between oral and systemic health by means of awareness campaigns.<sup>19</sup> In doing so, national health goals can be achieved by reducing these kinds of healthcare disparities.

Apart from this, studies with larger sample size should be considered in future, to extrapolate the study results to a larger professional population. Even para-medical healthcare providers can be included as a part of the study to seek better understanding.

### Limitations of the study

While we attempted to assess the attitude and knowledge of medical students, there are few confounding factors which may affect the responses of the participants such as participants personal interest in the subject, Interaction with para medical and dental peers which may affect their perception. Future studies can be structured to eliminate such bias.

### Conclusion

- Medical students showed fairly good knowledge and positive attitude towards dentistry, the analysis within the study groups showed that knowledge and attitude regarding the collaborative practice declined over the academic years among the medical students.
- There is a need for improved healthcare education curriculum for interprofessional management of patients with stress on significance of effects of oral health.

### Data availability

#### Underlying data

figshare: HARSHIT Data MASTERCHART.xlsx. <https://doi.org/10.6084/m9.figshare.19409354.v2><sup>20</sup>

This project contains the following underlying data:

- Data chart.xlsx

#### Extended data

figshare: HARSHIT Data MASTERCHART.xlsx. <https://doi.org/10.6084/m9.figshare.19409354.v2><sup>20</sup>

This project contains the following extended data:

- Data code statistical analysis.xlsx
- Questionnaire with consent form.docx

Data are available under the terms of the [Creative Commons Zero "No rights reserved" data waiver](#) (CC0 1.0 Public domain dedication).

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An earlier version of this article can be found on Research Square (<https://doi.org/10.21203/rs.3.rs-845988/v1>).



## References

1. Kapoor S, Sheokand V, Kaushik N, *et al.*: **Oral Health? Neglected Area on Global Health Map.** *Oral Health Dent Manag.* 2019; **18**(1). [Publisher Full Text](#)
2. Committee on Oral Health Access to Services: *Improving Access to Oral Health Care for Vulnerable and Underserved Populations.* National Academies Press; 2011.
3. Dolce MC, Aghazadeh-Sanai N, Mohammed S, *et al.*: **Integrating oral health into the interdisciplinary health sciences curriculum.** *Dental Clinics.* 2014 Oct 1; **58**(4): 829–843. [PubMed Abstract](#) | [Publisher Full Text](#)
4. Kasthuri A: **Challenges to healthcare in India-The five A's.** *Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine.* 2018; **43**(3): 141–143. [PubMed Abstract](#) | [Publisher Full Text](#)
5. Lo ECM: **Enhancing health care services through close collaboration between medical and dental professionals.** *Hong Kong Med. J.* 2014; **20**(2): 92–93.
6. Hendricson WD, Cohen PA: **Oral health care in the 21st century: implications for dental and medical education.** *Acad. Med.* 2001; **76**(12): 1181–1206. [Publisher Full Text](#)
7. Zhang S, Lo ECM, Chu C-H: **Attitude and awareness of medical and dental students towards collaboration between medical and dental practice in Hong Kong.** *BMC Oral Health.* 2015; **15**(1): 53. [PubMed Abstract](#) | [Publisher Full Text](#)
8. Migliorati CA, Madrid C: **The interface between oral and systemic health: the need for more collaboration.** *Clin. Microbiol. Infect.* 2007; **13**(Suppl 4): 11–16. [PubMed Abstract](#) | [Publisher Full Text](#)
9. Baron-Cohen S: *The Essential Difference: The Truth about the Male and Female Brain.* 1st ed. Basic Books; 2003.
10. Offenbacher S, Katz V, Fertik G, *et al.*: **Periodontal infection as a possible risk factor for preterm low birth weight.** *J. Periodontol.* 1996; **67**(10 suppl): 1103–1113. [Publisher Full Text](#)
11. Offenbacher S, Jared HL, O'Reilly PG, *et al.*: **Potential pathogenic mechanisms of periodontitis associated pregnancy complications.** *Ann Periodontol.* 1998; **3**(1): 233–250. [PubMed Abstract](#) | [Publisher Full Text](#)
12. Løe H: **Periodontal disease—the sixth complication of diabetes mellitus.** *Diabetes Care.* 1993; **16**: 329–334.
13. Edelstein BL: **Oral health services in the child health insurance program (CHIP).** *Children's Dental Health Project.* 1998.
14. Reinhard DA, Konrath SH, Lopez WD, *et al.*: **Expensive egos: narcissistic males have higher cortisol.** *PLoS One.* 2012; **7**(1): e30858.
15. Carpenter J: **Doctors and nurses: Stereotypes and stereotype change in interprofessional education.** *J. Interprof. Care.* 1995; **9**(2): 151–161. [Publisher Full Text](#)
16. Maharani DA, Ariella S, Syaafaaturrachma ID, *et al.*: **Attitude toward and awareness of medical-dental collaboration among medical and dental students in a university in Indonesia.** *BMC Oral Health.* 2019 Dec; **19**(1): 1–7. [Publisher Full Text](#)
17. Maharajan MK, Rajiah K, Khoo SP, *et al.*: **Attitudes and readiness of students of healthcare professions towards interprofessional learning.** *PLoS one.* 2017 Jan 6; **12**(1): e0168863. [PubMed Abstract](#) | [Publisher Full Text](#)
18. Laniado N, Cloidt M, Altonen B, *et al.*: **Interprofessional Oral Health Collaboration: A Survey of Knowledge and Practice Behaviors of Hospital-Based Primary Care Medical Providers in New York City.** *Adv. Med. Educ. Pract.* 2021; **12**: 1211–1218. [PubMed Abstract](#) | [Publisher Full Text](#)
19. Luebbbers J, Gurenlian J, Freudenthal J: **Physicians' perceptions of the role of the dental hygienist in interprofessional collaboration: A pilot study.** *J. Interprof. Care.* 2021 Jan 2; **35**(1): 132–135.
20. Atul Kumar H: **HARSHIT Data MASTERCHART.xlsx.** figshare. [Dataset.]. 2022. [Publisher Full Text](#)

# Open Peer Review

Current Peer Review Status: ? ✓ ?

Version 4

Reviewer Report 17 January 2024

<https://doi.org/10.5256/f1000research.151858.r234387>

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**Mahesh Khairnar**

Banaras Hindu University, Varanasi, India

**Umesh Wadgave**

Bharati Vidyapeeth Dental College, Pune, Maharashtra, India

1. How was the sample size calculated?
2. What were the results of content validation?
3. Was the reliability of the questionnaire tested?
4. Check the sentences for language errors. Past tense should be used while framing the sentence in the manuscript.
5. What was the purpose of categorizing age into three different categories? Does it make any sense? The age groups were closely related (<20,20-25,>25).
6. The authors have not presented the reasoning for questions showing significant differences.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Partly

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Public Health Dentistry

**We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however we have significant reservations, as outlined above.**

Reviewer Report 04 July 2023

<https://doi.org/10.5256/f1000research.151858.r181922>

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**Pathiyil Ravi Shankar** 

IMU Centre for Education, International Medical University, Kuala Lumpur, Malaysia

I have no further comments

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Health professions education

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

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Version 3

Reviewer Report 13 June 2023

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**Pathiyil Ravi Shankar** 

IMU Centre for Education, International Medical University, Kuala Lumpur, Malaysia

The authors have tried to address some of the points I raised during the previous review.

The points still unclear to me are the pretesting of the questionnaire and the percentage of students from each college who participated in the study. How exactly was the questionnaire administered? Did students feel obliged to participate in the study? I am unable to understand the point about continuing dental education mentioned in the Conclusion section. Also only having postings of dental students in medical departments may not lead to a positive attitude toward collaboration unless it is incorporated into the curriculum.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Health professions education

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

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## Version 2

Reviewer Report 27 September 2022

<https://doi.org/10.5256/f1000research.137907.r149770>

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**Pathiyil Ravi Shankar** 

IMU Centre for Education, International Medical University, Kuala Lumpur, Malaysia

Thank you for the invitation to review this manuscript.

My suggestions are:

### Introduction

- The authors can highlight what learning and other initiatives are undertaken at their institution to promote interprofessional education and collaboration.
- Why did the authors not study the attitude of dental students? For collaboration, both parties involved should have a favorable attitude.

### Methods

- Ethical approval was obtained over five years ago in 2017. What is the duration of the approval provided by the ethical committee?
- The study was done in 2019. It may be interesting to study the impact of COVID-19 on student attitudes.
- How exactly was the data collected? Where were the questionnaires completed?
- I am confused about which colleges were involved in the study. What percentage of students from each college had participated? How were these colleges selected?

- Page 8: Can the authors clarify the statement that they avoided including dental students to avoid positive response bias?
- In the limitations section, can the authors elaborate on how upbringing can affect interprofessional collaboration?
- Many of the statements in the questionnaire deal with dental complications of diseases and are not related to collaboration between medical and dental practitioners in my opinion. Can more details about the validation process of the questionnaire be provided?

### **Conclusion**

- The conclusion about continuing dental education does not seem to be based on data gathered during the study.
- A big limitation is not including the dental students and not having any idea about their perception of collaborative care.

### **Is the work clearly and accurately presented and does it cite the current literature?**

Partly

### **Is the study design appropriate and is the work technically sound?**

Partly

### **Are sufficient details of methods and analysis provided to allow replication by others?**

Partly

### **If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

### **Are all the source data underlying the results available to ensure full reproducibility?**

Yes

### **Are the conclusions drawn adequately supported by the results?**

No

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Health professions education

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.**

Author Response 20 Oct 2022

**Harshit Atul Kumar**

Thank you for the suggestions.

I would like to share with the reviewer that in India dental schools are not involved in teaching oral or dental healthcare-related topics among medical students. As per the curriculum, medical students have approximately a month of internship in dental school to shadow a dental faculty to observe cases. On the contrary, dental students are actively taught by faculty from the medical college and even have clinical postings for an entire year. Hence, the reason for not including dental students in this survey was that they have more exposure to possible interdisciplinary collaboration when compared to medical students. Although this doesn't guarantee a positive bias, the questions designed for the questionnaire are pertaining to how oral health affects general health, for which, we decided to assess medical students for their knowledge, attitude, and practice and avoided the dental students.

Ethical approval was obtained in 2017 and the study was completed in 2019, once the study was completed, we submitted the report to the institutional ethical committee, after which the validity of ethical approval is over.

I have mentioned in the methodology section about how and where the data was collected. We visited the medical colleges in and around Mangalore and collected responses in pen and paper format to meet the calculated sample size.

**Competing Interests:** No competing interests were disclosed.

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### Version 1

Reviewer Report 26 July 2022

<https://doi.org/10.5256/f1000research.122818.r136383>

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#### Saba Kassim

Department of Preventive Dental Sciences, College of Dentistry, Taibah University, Medina, Saudi Arabia

Thank you for considering me to review this paper.

My comments are as follows:

1. If the questionnaire was validated elsewhere, why was content and face validity done? By convention reliability (Cronbach alpha) and construct validity should be tested.

2. The authors repeated that the students were assessed for their knowledge and attitude using a 5-point Likert scale. Please check the last two paragraphs under 'Study and questionnaire design'.
3. The authors calculated the mean response score for each question and conducted the statistical analysis with the median of scores received as a measure of central tendency and evaluated the statistical significance. Why were the mean and median calculated at the same time? One of these central tendencies should be used according to the normality distribution. In addition, the authors compare the three age groups and education levels and mentioned the wrong test, Mann Whitney U test. It was appropriate to use ANOVA (if scores are normally distributed) with post hoc analysis to compare the three groups.
4. The authors used 'interdisciplinary' and 'interprofessional' interchangeably, consistency in using one of these terms is preferable unless there was an obvious reason(s).
5. This study has a number of limitations that should be mentioned in the discussion section.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**

Partly

**If applicable, is the statistical analysis and its interpretation appropriate?**

Partly

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Dentistry

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Author Response 03 Aug 2022

**Harshit Atul Kumar**



Thank you very much for your valuable review. I appreciate your effort to review my article. I understand the points you have raised and I shall make amendments and bring more clarity to the article. Article shall be updated accordingly and resubmitted soon.

**Competing Interests:** No competing interests were disclosed.

Author Response 05 May 2023

**Harshit Atul Kumar**

I have updated the article as per reviewers suggestions to Version 1 & 2 . I kindly request the reviewers to re-review again.

**Competing Interests:** No competing interests were disclosed.

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