

# Assessment of oral manifestations of systemic health related knowledge of medical students pursuing internship programme at a tertiary health care centre

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## ABSTRACT

**Aim:** Clinicians across the entire medical profession are responsible for detection, prevention and imparting importance of oral health to the patients. However, many studies conducted so far show lack of knowledge of medical students regarding dental conditions. The present observational study was undertaken to evaluate the knowledge of oral manifestations of systemic diseases amongst medical students undergoing Internship program at a tertiary centre.

**Materials & method:** A self-structured Questionnaire comprising of 20 questions was used as a survey tool to assess the understanding of 100 medical students undergoing internship program. They were explained about the purpose of the study. The questionnaire consisted of an objective part Yes/No (7 questions) and subjective part designed on likert scale(13 questions). There were questions on their view on current curriculum for dentistry in medical undergraduate training and possible enhancement in teaching modalities. The subjective part had five options to choose from, Strongly agree, Agree, Neutral, Disagree And Strongly Disagree.

**Statistical analysis:** The responses of objective questions was recorded and percentage calculated for both options. The total score was obtained for each participant based on their responses to the subjective questions based on the Likert scale. Student *t*-test was applied to calculate means between male and female students.

**Results:** For all objective questions, percentage was calculated for affirmative and negative responses. The responses were calculated on scale 5-1 for the subjective questions. Reverse scoring was done for questions 10,11,12 i. e scale 1–5. The maximum achievable score in this category was 65 which was further divided into three category as Excellent score range 55–65, Good score range 45–54, Unsatisfactory score range 35–44. The number of students in excellent category were 11, Good 66, unsatisfactory 23. The average score obtained was 48.175. The mean scores for males was 48.0161 and for females it was 48.142. The scores were slightly better for females but the difference was statistically insignificant as (p-value = 0.455056).

**Conclusion:** The present study showed good level of Knowledge on oral manifestations of systemic diseases among medical students as compared to other studies which forms an integral part of medical curriculum. The students responses on enhancing dental curriculum and teaching aids for improved education tools can help the faculty provide a better teaching learning experience.

## 1. Introduction

Oral cavity is the gateway of an individual's systematic health. Poor oral health has impact on basic needs including ability to eat drink, swallow, smile and communicate, thereby impacting quality of life. Untreated oral conditions pose major public health problem.<sup>1</sup> Today's

educational and Health care environment presents unprecedented opportunities for collaborations that can improve patient's care. All medical students need a basic understanding and treatment of oral diseases, in order to recognise oral health conditions, assess oral health risks, participate in preventive activities on behalf of their patients and refer them to a dental school or clinic whenever needed.

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Proper knowledge of oral diseases is crucial in medical practice due to the following reasons.

- (a) Periodontal diseases are associated with multiple systemic conditions of medical interest.
- (b) A large number of systemic diseases have oral manifestations.
- (c) Many drugs are associated with oral adverse drug reactions<sup>2</sup>

In rural areas, the population approaches primary health centres, where health providers are mainly medical practitioners. This necessitates the need of substantial knowledge in the field of oral health.<sup>3</sup> This study was undertaken to understand the awareness among the medical interns regarding oral diseases and their impact on overall health after completion of their medical course. An attempt was also made to evaluate the status of current content of dental syllabus in medical undergraduate curriculum.

## 2. Materials & method

### 2.1. Study design

A self-structured questionnaire based observational study was designed, following STROBE guidelines. The study protocol was approved by the institutional ethics committee. All the students undergoing internship programme in a academic year from July 2022 to July 2023 at a medical college and tertiary health care centre were included in the study. The sample size included 100 interns, as that was the number of interns that carried out their clinical posting during the study period. They were explained about the purpose of the study and were explicitly informed about their

voluntary participation via a written informed consent.

The data was collected by using self-structured questionnaire, comprising of 20 questions. It included demographic data, objective part and subjective part. The objective part had Yes/No type questions whereas subjective part was designed based on the Likert Scale, and had the main focus on questions related to oral manifestations of systemic diseases. There were questions on their view on current curriculum for dentistry in medical undergraduate training and possible enhancement in teaching modalities. The subjective part had 5 options to choose from starting from Strongly Agree, Agree, Neutral, Disagree And Strongly Disagree.

The designed questionnaire is as follows(Figs. 1 and 2):

### 2.2. Statistical analysis

The responses to the yes/no type questions were recorded and percentage calculated for both these options question wise. The subjective questionnaires were calculated on Likert scale. Student t-test was used to compare the means between the male and female students.

## 3. Results

The results of the objective part of the questionnaire are shown in Fig. 3. The subjective questionnaire questions were given the score 5-1 (strongly agree –5, strongly disagree-1) and all the responses calculated. For question no.10,11,12 reverse scoring was done.(strongly disagree-5, strongly agree-1). The maximum possible score achievable in this section was 65. The scores obtained by the participants were subdivided into three category as Excellent, Good, Unsatisfactory/Poor. The score range for the categories were as follows (Fig. 4).ss.

Questionnaire
MBBS SEMESTER-
GENDER- 1) <input type="checkbox"/> MALE 2) <input type="checkbox"/> FEMALE
<b>OBJECTIVE ASSESSMENT</b>
1. Do you think the overall systemic health affects the oral health. 1)YES 2) NO
2.Do you think systemic diseases can have oral manifestations “ <b>first</b> ” in the oral cavity. 1)YES 2) NO
3.The current curriculum for dentistry for the medical undergraduates provides sufficient knowledge regarding the oral manifestations of systemic disorders. 1) YES 2) NO
4.The allotted lecture hours for dentistry curriculum prescribed by the National Medical Commission is sufficient. 1) Yes 2) No
5. The current duration of clinical postings in the department of dentistry is sufficient to understand your curriculum. 1) Yes 2)No
6. Clinical postings in the department of dentistry have helped you understand the oral manifestations of systemic diseases. 1) Yes 2) No
7. Will the use of audiovisual aids like LCD projectors, intra-oral cameras , slide projectors, help you understand the curriculum better. 1) Yes 2) No

Fig. 1. Part 1 of the questionnaire - Objective assessment.

**SUBJECTIVE ASSESMENT (SCORES BASED ON LIKERT SCALE)**

<p><b>Q1. All of the following disorders can have oral manifestations (Numbers in front of each option indicate points awarded on the Likert scale)</b></p> <p>1.Lifestyle and metabolic disorders.</p> <p>2. Nutritional disorders</p> <p>3. Endrocrinal disorders</p> <p>4. Renal diseases</p> <p>5. Bone disorders</p> <p>6.Hematologic disorders</p> <p>7.Infectious diseases</p> <p>8. Neuromuscular disorders</p> <p>9.Gastrointestinal disorders</p> <p>1)Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree 5) Strongly Disagree.-1</p> <p><b>Q2. Diabetes mellitus, leukaemia, scurvy, can severely impact the gums and periodontal health causing bone loss in the oral cavity.</b></p> <p>1) Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree.-1</p> <p><b>Q3. The dorsum of the tongue is affected in anaemias and vitamin deficiencies.</b></p> <p>1)Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree-1</p> <p><b>Q4. Certain viral diseases can show up first in the oral cavity prior to the rest of the body.</b></p> <p>1)Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree-1</p> <p><b>Q5. Non tooth related pain on the left side of the lower jaw could be of cardiovascular origin.</b></p> <p>1)Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree.-1</p> <p><b>Q6. Dental caries can occur because of systemic causes.</b></p> <p>1)Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree.-1</p> <p><b>Q7. A ground glass appearance of the bony trabeculae on an intra-oral radiograph accompanied by a history of generalised bony pain warrants the need a complete radiographic skeletal survey.</b></p> <p>1)Strongly Agree—5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree-1</p> <p><b>Q8. Erosive changes in the teeth can indicate an underlying gastrointestinal condition</b></p> <p>1)Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree-1</p> <p><b>Q9. The dental hard and soft tissues can be adversely affected during radiotherapy and chemotherapy.</b></p> <p>1)Strongly Agree-5 2) Agree-4 3) Neutral-3 4) Disagree-2 5) Strongly Disagree-1</p> <p><b>Q10. Jaw numbness is always the result of a dental and oral condition. (REVERSE SCORE)</b></p> <p>1)Strongly Agree-1 2) Agree-2 3) Neutral-3 4) Disagree-4 5) Strongly Disagree.-5</p> <p><b>Q11. Arthritic changes in the temporomandibular joint is always related to oral malocclusion and local trauma.(REVERSE SCORE)</b></p> <p>1)Strongly Agree-1 2) Agree-2 3) Neutral-3 4) Disagree-4 5) Strongly Disagree-5</p> <p><b>Q12. The term orofacial pain encompasses pain felt in the mouth, jaws and the face due to localised causes only- (REVERSE SCORE)</b></p> <p>1)Strongly Agree-1 2) Agree-2 3) Neutral-3 4) Disagree-4 5) Strongly Disagree-5</p> <p><b>Q13. Salivary Diagnostics and oral biopsies can help you diagnose certain systemic disorders.</b></p> <p>1)Strongly Agree-1 2) Agree-2 3) Neutral-3 4) Disagree-4 5) Strongly Disagree-5</p>
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Fig. 2. Part 2- Subjective part of the questionnaire.

QUESTION 1	PERCENTAGE OF RESPONSES
Q1	100% participants replied in the affirmative.
Q2	82% Participants replied in the affirmative, whereas 18% gave a negative response.
Q3	80 % participants replied in the affirmative, whereas 20% gave a negative response.
Q4	82% Participants replied in the affirmative, whereas 18% gave a negative response.
Q5	55 % participants replied in the affirmative, whereas 45% gave a negative response.
Q6	90 % participants replied in the affirmative, whereas 10% gave a negative response.
Q7	60 % participants replied in the affirmative, whereas 40% gave a negative response.
Q8	90 % participants replied in the affirmative, whereas 10% gave a negative

Fig. 3. Summary of the results of the objective part of the questionnaire.

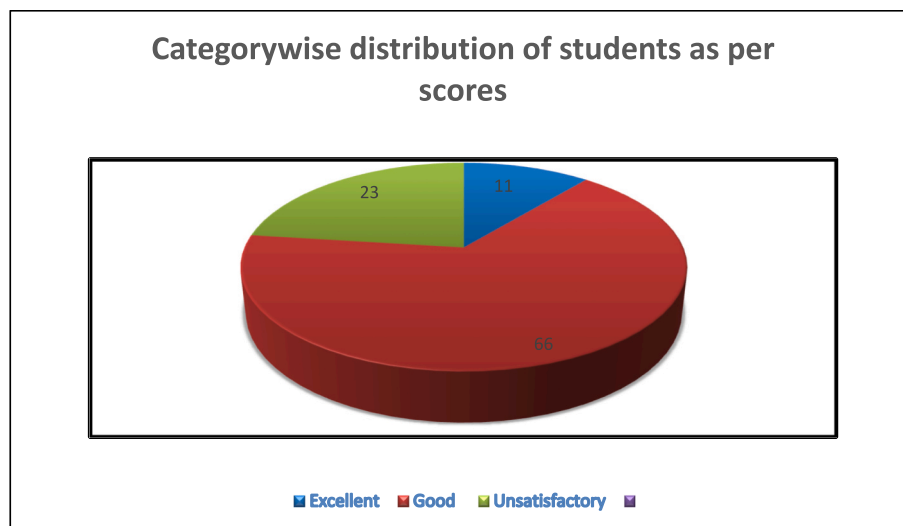


Fig. 4. Summary of the results of the subjective part of the questionnaire.

- Unsatisfactory-35-44,
- Good-45-54,
- Excellent-55-65

The average of score obtained by the participants was 48.175. 23 students were in the unsatisfactory category, 66 in Good and 11 in Excellent category. The above scores depicted that most interns had a good/satisfactory knowledge of dentistry. These results are summarised in Table 1. And Fig. 4.

**Table 1**  
Category-wise distribution of the students as per the score range.

Score Range	Category	Number of students
55–65	Excellent	11
45–54	Good	66
35–44	Unsatisfactory	23

The female students showed slightly better scores, but the difference was statistically not significant as per the student *t*-test results. (*t*-value  $-0.11318$ , *p*-value  $0.455056$ , The result was not significant at  $p < 0.05$ ) (Table 2).

#### 4. Discussion

The separation of Professional education between medicine and dentistry weighs back to 1840 when physicians at Maryland College rejected the proposal of combining the two curriculum, resulting in

**Table 2**  
-Shows the average scores obtained by male and female students separately.

	Number	Mean	P value
Males	62	48.0161	
Females	38	48.142	

separate schools. Since then the effort is made to include dental instructions in medical curriculum.<sup>4</sup>

Dentistry is already included in Medicine in India where interdisciplinary teams are treating head and neck cancers, craniofacial syndromes and growth dysplasias, temporomandibular disorders, and obstructive sleep apnea and ensuring that cardiovascular and transplant patients are free of oral disease prior to surgery. Yet, despite enhanced integration, collaboration is especially needed for patients with known oral health comorbidities (eg, diabetes, cardiovascular disease, rheumatologic conditions, preterm labor).<sup>5</sup>

Oral health is essential to general health and quality of life. “It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychological wellbeing.”<sup>6</sup>

There are several barriers to oral health care in India, identified by Singh et al. as: (i) a lack of acknowledgment of the importance of oral health among the population, which perceives it as independent from and secondary to general health; (ii) no access for many to an oral health provider due to geographic distance; (iii) dental treatment is unaffordable for many; and (iv) quality of dental treatment is varied.<sup>7</sup>

The present study was undertaken to assess know how of systemic health related oral manifestations in medical students undergoing internship program at tertiary health centre. 100 student participants were taken as sample size out of which 62 were males and 38 were females.

The objective questionnaire showed participants had good knowledge of dentistry. This was in contrast of other studies available which showed poor dental knowledge of medical students.<sup>1,8,9</sup> However, the present study was in accordance with a Chennai based cross-sectional study and King Faisal university, Saudi Arabia which revealed that undergraduates, post graduates and diploma holders had moderate to good level of dental awareness.<sup>10,11</sup>

In present study, the participants knowledge on subjective questionnaire was good as number of students in score range 45–54 was 66. This was again in accordance with Ingle et al.<sup>10</sup> However, study by Opeodu<sup>12</sup> et al. was in contrast and proved deficient knowledge among medical doctors. There have been studies where it is observed that introducing oral health education definitely improved students understanding and skills to identify systemic diseases.<sup>13,14</sup>

The overall mean for score category was 48.1 and mean value for females were slightly better than males, but the difference was statistically not significant. Hence, the study conducted in this region of Rajasthan depicted a better oral health education and dental curriculum used to teach undergraduate medical students. **The present study was limited by the lack of responses from the seventh and eighth semester students who were in the process of their undergraduate training.**

## 5. Conclusion

The current study demonstrated a good knowledge towards oral manifestations of systemic diseases which forms an integral part of medical education. It is to mention that course content of Dental curriculum should mainly focus on assisting medical students in identifying, diagnosing systemic diseases from oral manifestations. Introduction of the dental notations and frequently used terms will improve the understanding the dental records in cases of consultation. The dental knowledge will also prove effective in understanding the concept and will have positive attitude towards their personal oral hygiene care thereby helping in prevention of oral and maxillofacial diseases.

AI statement- No AI tools were used in the preparation of this manuscript.

## Declaration of competing interest

The authors do not have any conflicts of interest.

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