

Student-Based Evaluation of Tangible and Intangible Oral Medicine Topics

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Abstract

Objective: To evaluate the oral medicine knowledge, readiness, and attitudes of final-year undergraduate dental students at the faculty of dental sciences.

Methods: A questionnaire-based cross-sectional study was conducted using Google Form with 261 fifth-year dental students. The questionnaire items are based on the Likert scale. The student-based assessment for their level of knowledge on different oral medicine items was validated for its internal consistency. For further assessment purposes, oral medicine topics were divided into tangible and intangible topics.

Results: Almost 78% of respondents judged oral medicine essential for the undergraduate dental curriculum. Almost half of the participants concluded that Oral Medicine (OM) knowledge is extremely important in relation to their expertise (47.9%). Low to moderate responses in relation to OM importance were reported in less than 22% of the responses. A significant relationship, however, has been found between the importance of OM for undergraduate knowledge and its clinical usefulness ($P < 0.001$). The vast majority (229) (87.7%) of students think OM is mostly related to oral pathology, and only 32 (12.3%) of students think that OM is related to other clinical specialties. Students believe that ulcerative vesiculobullous lesions are the most difficult topic, followed by the oral manifestation of systemic disease. Their assessment of their learning in ulcerative vesiculobullous lesions and orofacial pain reflects poor knowledge in these topics.

Conclusions: From an educational point of view, though ulcerative vesiculobullous lesions and oral symptoms of systemic disorders are practically tangible elements, students evaluated them as complicated issues corresponding to intangible disorders such as orofacial pain. These topics require more focus during undergraduate clinical training through a multifaceted educational approach. In addition, it appears that the integration between educational and clinical aspects in dentistry students' curricula is a crucial factor for enhancing their knowledge.

Keywords: oral medicine, dental education, oral medicine learning, dental school curriculum

Background

Oral medicine is a field of dentistry that concentrates on treating patients with complex medical conditions, as well as diagnosing and treating oral mucosal diseases, salivary gland disorders, and orofacial pain.^{1,2}

Oral health relies upon a precise treatment and diagnosis of oral diseases, which can also be a sign of excellent dental hygiene. A broad range of disorders is represented by oral lesions, which may manifest alone or in conjunction with other dermatological conditions.^{3,4}

The growing need for oral medicine care has necessitated the inclusion of more content in the dental school curriculum.⁵

Interesting information about variations in oral health attitudes and behaviors among undergraduate dentistry students was uncovered by the Hiroshima University-Oral Behavioral Inventory (HU-DBI) questionnaires. Thus, it might open opportunities for the creation of new projects aimed at enhancing the disposition and conduct of dental students. As a result, dentistry schools might evaluate their courses to promote good behavioral attitudes and necessary oral health practices. This enables them to alter their dentistry education programs at every level.⁶

In a study published in Jazan, Saudi Arabia, Jafer et al. assessed the attitudes of dental professionals and students toward prevention and early identification of oral cancer. The study emphasized an absence of dental training and education in this field and looked at the potential consequences for dentists' capacity to recognize and prevent oral cancer in their local areas.⁷

The knowledge and proficiency of dental students in certain areas of oral medicine education, such as orofacial pain and oral carcinoma screening, have not been extensively studied by any single-institution research.^{8–10}

The current study's objective was to evaluate the oral medicine knowledge, readiness, and attitudes of final-year undergraduate dental students at faculty of dental sciences.

Methods

Participants in this study were 74 (28.4%) men and 187 (71.6%) women, achieving a 100% rate of responses, and they were informed about the nature of the study and its objectives and informed that they are totally free to participate, and they can withdraw from the study at any time; and they consented.

This questionnaire-based cross-sectional study was designed to determine how undergraduate dental students perceived oral medicine as a subject, its potential clinical relevance, and student-based assessment for different Oral Medicine (OM) topics.

Bachelor's dental students were given a self-administered questionnaire consisting of fifteen items, disciplines were chosen, and their items were converted into an online questionnaire. Between January and February of 2025, 261 students in their fifth academic year in the College of Dentistry of the Ibn Sina University in Iraq's Baghdad, conducted the questionnaire.

The questionnaire was modified from previous research¹¹ that evaluated the knowledge, attitudes, perspectives, and

trust of dental students with respect to oral medicine teaching and clinical practice. Adjustments were made to correspond with the goals of the current study. The survey had questions assessing oral medicine's perceived importance, clinical utility, challenging subjects, individual diagnostic expertise, and strategies for enhancing oral medicine understanding.

Cronbach's alpha value was used to assess the reliability of the survey; a consistent internal score of 0.70 or greater was determined to be acceptable.

Sample Size

All undergraduate final-year dentistry students studying in Ibn Sina University's Faculty of Dentistry during the 2024–2025 academic year were the subject matter of the study. There were 261 students in the entire available population. The census selection approach was used, and no formalized sampling size calculation was necessary because all qualified students were requested to take part.

Criteria for Inclusion

- Fifth-year undergraduate dentistry students who graduated in the 2024–2025 year of study.
- Students had finished the first oral medicine theoretical course and the midterm assessment.
- Students who took part in oral medicine clinics or lectures.

Criteria for Exclusion

- The first, second, third, and fourth dental students were not yet getting practical training or oral medicine courses of study.
- Postgraduate trainers.
- Learners who have already received formal oral medical education outside of the classroom (to minimize bias).

Tool for Data Gathering

The following are requested in the questionnaire:

- Personal information (gender, age).
- Importance of Oral Medicine OM for undergraduate education knowledge, evaluated using a Five-point Likert scoring scale.
- Benefit of Oral Medicine OM to clinical practice, evaluated using a Five-point Likert scoring scale.
- A nine-item scale on students' evaluation of their diagnostic skills in various clinical oral medicine topics.

A five-point Likert scale was used for questionnaire responses.

For assessment purposes, Oral Medicine topics were divided into 2 categories: tangible and intangible topics. Tangible topic refers to pathological entities or disease manifestations, which could be visually examined by the clinician (visualized). These are all types of swellings, ulcers, red, and white lesions. Intangible topic, on the other hand, refers to pathological entities or disease manifestations, which cannot be visually examined (conceptualized). These include dental, orofacial pain, and Temporomandibular Disorders.

Analytical Statistics

SPSS was used to enter the inputs for analysis. For the sake of questionnaire validation, Cronbach's Alpha was used to measure the internal consistency. As shown in Table 1, the questionnaire is reliable with a good Cronbach's Alpha index.

To summarize the responses, descriptive and frequency statistics were employed. Inferential statistics were applied to investigate relationships between the questionnaire items, including the Pearson Chi-Square Test and Spearman Correlation Test. The level of statistical significance was established at a *P*-value of less than 0.05%.

Results

Out of 261 participants, 74 (28.4%) were males, and 187 (71.6%) were females. As shown in Fig. 1, a high level of perceived importance was reported in over 78% of responses. Almost half of the participants (47.9%) find that OM knowledge is extremely important in relation to their knowledge. Low to moderate responses in relation to OM importance were reported in less than 22% of the responses.

Students' perceived OM usefulness in their clinical practice (Fig. 2) does not mirror their perceived importance to their undergraduate knowledge. Students showed a 10% lower response rate in the highest category compared to almost 48% in the highest (extremely important) category in relation to OM knowledge. More than 30% of students showed a low to moderate level of appreciation toward OM's usefulness in clinical practice. A significant relationship, however, has been found between the importance of OM for undergraduate knowledge and its clinical usefulness Spearman's ρ is 0.436 and the correlation value for Kendall's tau-b was 0.395. $P < 0.001$. (Table 2). A moderate impact size is indicated by the correlation's magnitude.

As illustrated by Fig. 3, the vast majority (229) of students think OM is mostly related to oral pathology, which is a preclinical science. Only 32 (12.3%) think that OM is highly related to other clinical sciences. Notably, OMFS was identified as related to OM by only 21 students. Furthermore, dental students do not think that OM is highly relevant to conservative dentistry and orthodontics.

The perceived level of difficulty for OM topics is shown in Fig. 4. Students think that ulcerative vesiculobullous lesions are the most difficult OM topic (tangible), with almost half of the responses. Other difficult OM topics were oral manifestation of systemic diseases (tangible topic), followed by orofacial pain (intangible topic). TMD (intangible) and salivary gland diseases (tangible) are the least difficult compared to the other reported topics. Red and white lesions (tangible) are not mentioned within the most difficult topics of OM.

As demonstrated in Table 3, apart from orofacial pain and ulcerative vesiculo-bullous lesions, participants agreed that their knowledge on different OM topics is good in more than

Table 1. Reliability statistics

Cronbach's Alpha	Cronbach's Alpha based on standardized items	N of items
0.807	0.807	9

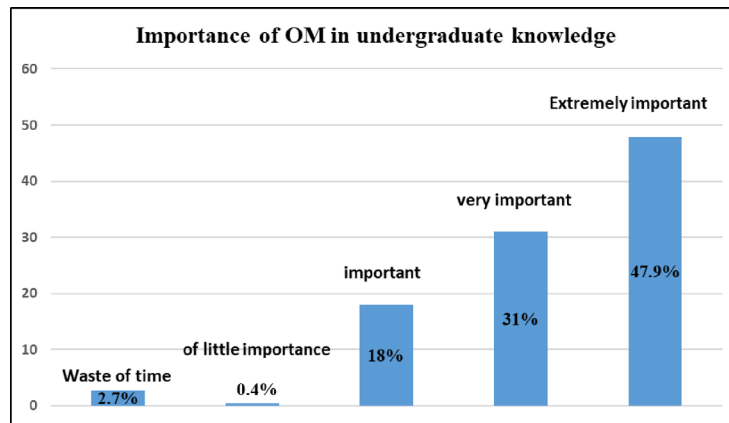


Fig. 1 Perceived level of OM importance for undergraduate knowledge.

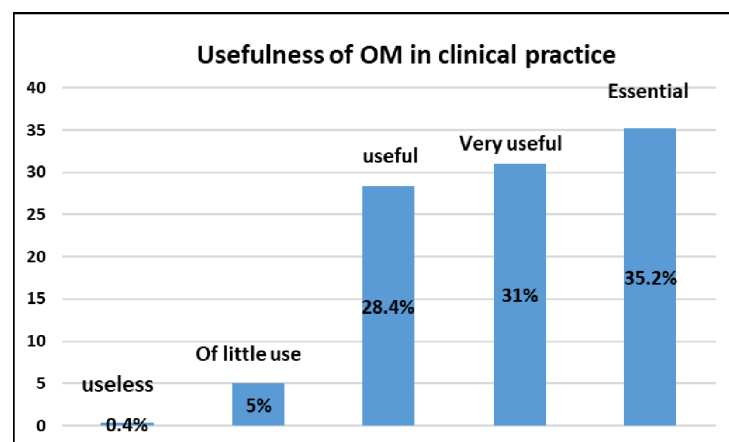


Fig. 2 Perceived level of OM importance for clinical practice.

Table 2. Relationship between students' evaluations of oral medicine's applicability and its advantages for prospective clinical practice

parameter 1	parameter 2	Kendall's tb	Spearman's p	P-value	Interpretation
Perceived relevance of Oral Medicine to undergraduate knowledge	Perceived benefit of Oral Medicine in future clinical practice	0.395	0.436	<0.001	Moderate positive correlation

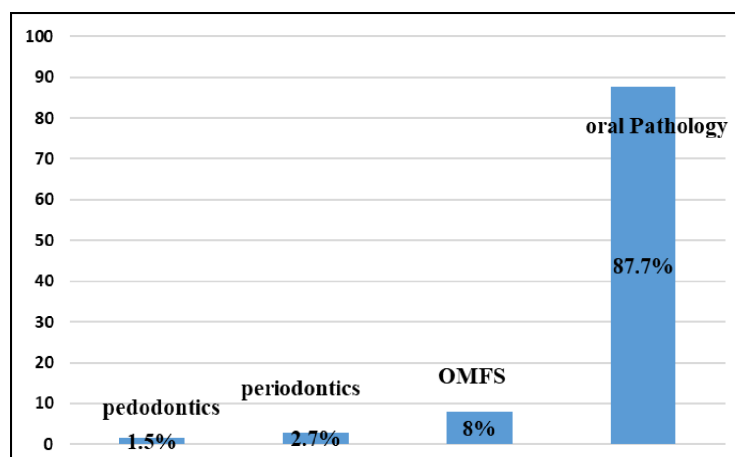


Fig. 3 Perceived relationship between OM and other dental subjects.

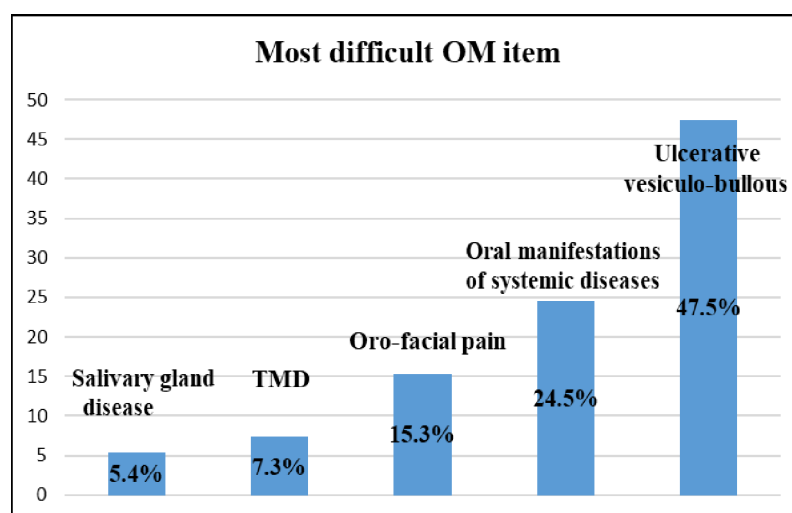


Fig. 4 Level of difficulty by OM topic.

Table 3. Frequency statistics for perceived knowledge level in different OM topics

Oral Medicine topics	Poor, n (%)	Good, n (%)	Very good, n (%)
Overall oral diagnosis	56 (21.5)	173 (66.3)	32 (12.3)
Dental pain	35 (13.4)	162 (62.1)	64 (24.5)
Temporomandibular disorders (TMD)	55 (21.1)	163 (62.5)	43 (16.5)
Orofacial pain	117 (44.8)	128 (49.0)	16 (6.1)
Vesiculo-ulcerative lesions	129 (49.4)	113 (43.3)	19 (7.3)
Oral pigmentation	70 (26.8)	160 (61.3)	31 (11.9)
White lesions	75 (28.7)	156 (59.8)	30 (11.5)
Red lesions	90 (34.5)	146 (55.9)	25 (9.6)
Oral manifestations of systemic diseases	72 (27.6)	151 (57.9)	38 (14.6)

half of the responses, ranging from 55.9% (in red lesion topic) to 66.3% (in overall diagnostic knowledge).

Nevertheless, the poor knowledge responses in these topics cannot be ignored. Apart from dental pain (13.4%), the poor level of knowledge ranged between 21.1% (in the TMD topic) to 34.5% (in the red lesions topic). Poor knowledge of ulcerative vesiculobullous lesions was the highest reported response, followed by the orofacial pain topic.

Discussion

The fact that most of the respondents were female, comparable to research performed in Nepal by Kasarla et al. (2023), the proportion of women in dental practices has been increasing over time. Flexible working hours and work harmony are the two primary motivators for women to choose the dental profession.^{12–14}

According to this study, students do acknowledge the importance of OM in their education. This, however, is not related as it seems to benefit from this subject in other clinical dental specialties. This evidence leads us to conclude that their response to the question about the benefits of OM in their clinical practice is restricted to disease processes that are not treated in other educational clinics.

The OM clinic's teachings do not correlate with those of other educational clinics. This finding reflects what appears to be a fundamental flaw in the educational curricula.

Oral medicine provides the theoretical background for clinical practice. It helps dental students approach the disease process with the proper thinking and suitable investigation.¹⁵ This is what every student needs as they deal with each patient, regardless of their clinical dental situation.

The reason for categorizing OM topics into tangible and intangible was to understand how dental students assess their knowledge based on what can be visualized or conceptualized. This assessment enables educational staff to address any knowledge gaps with a suitable educational method. To the best of the authors' knowledge, this is the first study to adopt this classification.

The data indicate that students do not treat clinical situations based on the imagery vs conceptual approach. They appear to be more satisfied with what they are familiar with. Despite dental pain being an intangible diagnostic element, most dental students think they are good at its diagnosis. This might be related to the fact that caries-related dental pain is the most common clinical problem,^{16–18} and students deal with it in different educational clinics.

On the other hand, ulcerative vesiculobullous lesions, which are tangible (can be visually examined), are the most difficult topic, and they do not think they have good knowledge about it. This might be related to the challenges related to their diagnosis,¹⁹ their paucity,²⁰ and their association with a wide variety of systemic conditions.²¹

Researcher discovered that the least dental competence score among dentistry graduates was related to detection of oral disorders.²² A further study shows that their lowest skills were those related to the domains of managing TMJ, diagnosing oral/facial pain, and emergency situations at the dental clinic.²³

Another important finding of this study is the clinical reasoning approach. It reflects that clinical training in dental schools relies on specialty/department-based education. The degree to which educational curricula and supervising explicitly relate early theoretical learning to clinical reasoning may have a significant impact on dental students' competence to do so. Numerous research conclusions are consistent with integration frameworks' findings, which indicate that when academics effectively integrate basic concepts into clinical efficacy cases, symptom types, and methods of decision-making, students will acquire and retain them more efficiently.^{24–26}

This means students perform their clinical training in each specialty separately, with specific clinical regulations adopted by each clinical department. This appears to orient dental students' minds to be specialty/department-oriented rather than patient-oriented clinical approach.

This clinical education practice limits students' exposure in the oral medicine clinic to cases not treated by other departments. These clinical cases mainly include common aphthous ulcer conditions,^{27–29} TMJ problems.^{30,31} And to a lesser extent, white and red lesions.^{32,33}

The study findings suggest that uncommon clinical conditions in the educational OM clinic require more focus during undergraduate training through comprehensive theoretical materials, seminars, and visual educational tools to familiarize students with these topics. The same applies to orofacial pain, which is a wide topic that involves different pathological, neural, and vascular elements.

Studies have demonstrated that concise, focused training interventions can greatly enhance accuracy in diagnosis and decision-making abilities among dental and healthcare graduates. This emphasizes the ongoing value of systematic, evidence-based approaches in the oral medicine curriculum.^{34,35}

The enhancement in junior dentists' capacity to recognize oral diseases found in the study conducted by Aljohani et al.

emphasizes the necessity for ongoing education programmes that involve oral lesion management and diagnosis to assure a consistent level of practical competence.³⁵

Conclusion

From an educational point of view, though ulcerative vesiculobullous lesions and oral symptoms of systemic disorders are practically tangible elements, students evaluated them as complicated issues corresponding to intangible disorders such as orofacial pain. These topics require more focus during undergraduate clinical training through a multifaceted educational approach. In addition, it seems that the integration between educational and clinical aspects in dentistry students' curricula is a crucial factor for enhancing their knowledge.

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List of Acronyms

OM - oral medicine
SPSS - Statistical Package for Social Sciences
OMFS - oral maxillofacial surgery
TMD - temporomandibular joint disorders
TMJ - temporomandibular joint

Ethics-based Accreditation

This work, coded ISU.41.1.26, was approved by the Institute of Review Board (IRB) and the Ethical Council of Ibn Sina University of Medical & Pharmaceutical Sciences. Its compliance with ethical standards and consent was confirmed.

Conflicts of Interest

The authors declare no conflicts of interest.

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