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CHALLENGES FACED BY DENTAL STUDENTS IN LEARNING ORAL PATHOLOGY AND ORAL HISTOLOGY: A CROSS-SECTIONAL ANALYSIS

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Abstract

Background: Oral Pathology and Oral Histology form the cornerstone of diagnostic dentistry, equipping students with the knowledge required to identify and understand various oral diseases at the microscopic and clinical levels. Despite its significance, students often face challenges in comprehending and retaining the subject matter. Identifying these difficulties and enhancing the teaching methodology is crucial for improving learning outcomes and fostering a deeper interest in the field. **Aim:** To evaluate and assess the difficulties encountered by dental students in studying Oral Pathology and Oral Histology, and to explore potential strategies for improving their understanding and engagement with the subject. **Materials and Methods:** A descriptive cross-sectional study was conducted among first-year, third-year, and intern dental students. A structured, pre-validated online questionnaire consisting of multiple-choice questions and one open-ended question for student suggestions was distributed. The questionnaire was designed to be simple and effective for evaluating students' perspectives on the subject. The collected data were statistically analyzed to assess knowledge gaps and areas of difficulty. **Results:** The study revealed that while dental students are expected to have adequate knowledge of Oral Pathology and Oral Histology, there exist significant gaps in understanding and awareness. The responses indicated challenges in grasping histopathological concepts, retaining theoretical knowledge, and effectively correlating microscopic findings with clinical presentations. **Conclusion:** This study highlighted the difficulties faced by dental students in mastering Oral Pathology and Oral Histology. Addressing these challenges through innovative teaching methodologies, including digital learning tools and interactive sessions, could significantly enhance student engagement and comprehension.

Keywords: Oral Pathology, Oral Histology, Dental Education, Learning Difficulties, Teaching Methodology, Student Engagement

INTRODUCTION

Dental education is a dynamic combination of theoretical learning and hands-on skill development, aimed at shaping competent dental professionals. Evaluating the effectiveness of the dental curriculum through student feedback is essential to ensuring continuous improvements in both knowledge dissemination and skill acquisition. A primary focus of dental education is to strengthen students' competencies, equipping them with the necessary expertise to transition into proficient practitioners. Knowledge in dentistry is acquired through various sources, including mass media, dental professionals, and academic literature. Developing a positive attitude towards oral health promotion during dental training is crucial, as dental students are the future providers of oral healthcare and play a pivotal role in public health awareness and patient education.[1]

Oral histology provides a foundational understanding of the microscopic development of oral structures, while oral and maxillofacial pathology focuses on the clinical, radiographic, and histopathological diagnosis of diseases affecting the oral and maxillofacial regions. Mastering these subjects is essential for accurate disease identification and treatment planning. The ability to diagnose oral lesions effectively is a fundamental skill that determines the competence of future dental practitioners. Therefore, developing a strong grasp of oral pathology during the academic phase is imperative. [2]

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The Department of Oral Pathology plays a crucial role in training students to bridge the gap between theoretical knowledge and clinical application. Various learning resources, including textbooks, online platforms, and scientific conferences, contribute significantly to students' comprehension of the subject.[3] The introduction of digitalized slides and virtual microscopy has further enhanced the learning experience by allowing students to explore histopathological features with greater clarity and precision.[4]

The aim of this study was to assess the orientation of dental students toward oral pathology and identify the challenges they face in understanding the subject. The findings will help in implementing necessary modifications in teaching methodologies, ultimately improving student engagement and competence in oral pathology. Addressing these difficulties will contribute to better educational strategies and ensure that students acquire the required knowledge and skills to excel as future dental practitioners. [5]

MATERIALS AND METHODS

The study employed a structured, pre-validated questionnaire designed to assess students' perspectives, learning difficulties, and suggestions for improving the subject's teaching methodology. The questionnaire was formulated based on an extensive literature review and expert consultation to ensure content validity. To establish the reliability of the questionnaire, a pilot study was conducted among a small subset of students, and internal consistency was measured using Cronbach's alpha, which yielded an acceptable value, indicating the reliability of the instrument.

The questionnaire comprised 15 multiple-choice questions, addressing various aspects of students' experiences in learning oral pathology. The first question identified the academic year of the participant, while the final question sought student recommendations for enhancing their understanding of the subject. To ensure clarity and ease of comprehension, the questionnaire underwent multiple rounds of expert review and was refined based on feedback.

Prior to data collection, all participants were briefed about the study's objectives, and informed consent was obtained. The questionnaire was distributed electronically through institutional communication platforms, including social media groups and direct personal contacts, ensuring broad and convenient access. The study sample consisted of 314 students, categorized as follows: 115 interns, 106 third-year students, and 93 first-year students. To minimize bias, participation was voluntary, and responses were anonymized to maintain confidentiality and encourage honest feedback.

All responses were systematically compiled and subjected to statistical analysis. The chi-square test was employed to determine associations between categorical variables, ensuring a robust evaluation of the data. A probability (p) value of <0.05 was considered statistically significant, reinforcing the study's analytical rigor. The methodological approach, including the validation of the questionnaire and statistical analysis, was implemented to ensure high standards of reliability and accuracy in the findings.

RESULTS

The participants were asked about the year they were studying in 29.81% were in first year 33.97% in 3rd year and 36.22% in internship. When asked about if it is necessary to explain the slides before they are focused 79.17% said yes. Did they ask their teachers to explain in case of difficulties,41.99% said no. asked if they make record books for their classes62.5% said yes. Did they explore oral pathology techniques 59.62% said yes. Were they aware of histology slides said no 52.56% participants. When asked how they identify slides 47.12% said both ways from inside and outside. Asked how well can they identify the features on a slide after seeing it for the first time45.51% said almost never. Did they make an effort to read the topic before they see the slide 43.27% said no. did they make histological diagram for each slide 66.99% said yes. What was the main difficulty they encountered during practical exam 31.09% said drawing the diagrams and 30.45% said remembering the histopathological features. What was the prime source of knowledge about the topics 40.71% said notes,26.92% textbook,21.47% internet and 9.62% said none of the above. Did they attend seminars related to oral pathology topic, 54.17%

said no. Do they use charts and models help in understand the topic better 66.99% said yes.

TABLE 1:

Sl no.	Question	Response	Frequency	Percentage
.	Which year are you studying?	1st year	93	29.81
		3rd year	106	33.97
		Intern	113	36.22
.	Do you feel it is necessary to explain the slides before they are focused?	Yes	247	79.17
		No	65	20.83
.	Do you ask your teachers to explain, in case of difficulties	Yes	130	41.67
		No	131	41.99
		Sometimes	51	16.35
.	Doyou make record books for your classes?	Yes	195	62.5
		No	117	37.5
.	Did you ever explore oral pathology techniques?	Yes	186	59.62
		No	126	40.38
.	Are you aware of histology techniques?	Yes	148	47.44
		No	164	52.56
.	How do you actually identify the slide?	From outside	28	8.97
		From inside	91	29.17
		Both ways	147	47.12
		Never bothered	42	13.46
		Other	4	1.28
.	How well can you identify the features on a slide after seeing it for the first time?	Very well	66	21.15
		Almost never	142	45.51
		Sometimes	104	33.33
.	Do you make an affort to read the topic before you see the slide?	Yes	95	30.45
		No	135	43.27
		Sometimes	82	26.28
0.	Do you make histological diagram for each slide?	Yes	209	66.99
		No	103	33.01
1.	What is the main difficulty you encountered during practical exam?	Identification of slides	44	14.10
		Drawing the diagrams	97	31.09
		Remembering the histopathological features	95	30.45
		All of the above	67	21.47
		Other	9	2.88
2.	What is your prime source of knowledge about the	Textbook	84	26.92
		Notes	127	40.71

	topics	internet	67	21.47
		None of the above	30	9.62
		Other	4	1.28
3.	Have you attended seminars related to oral pathology topic?	Yes	143	45.83
		No	169	54.17
4.	Does the usage of charts and models helps in understanding the topic better ?	Yes	209	66.99
		No	103	33.01

TABLE 2

			Which year are you studying?			P value
Sl no.	Question	Response	1st year	3rd year	Intern	
.	Do you feel it is necessary to explain the slides before they are focused?	Yes	79(32)	77(31.2)	91(36.8)	0.09
		No	14(21.5)	29(44.6)	22(33.8)	
.	Do you ask your teachers to explain, in case of difficulties	Yes	59(45.4)	26(20)	45(34.6)	<0.01**
		No	22(16.8)	63(48.1)	46(35.1)	
		Sometimes	12(23.5)	17(33.3)	22(43.1)	
.	Doyou make record books for your classes?	Yes	64(32.8)	51(26.2)	80(41)	<0.01**
		No	29(24.8)	55(47)	33(28.2)	
.	Did you ever explore oral pathology techniques?	Yes	65(34.9)	51(27.4)	70(37.6)	<0.01**
		No	28(22.2)	55(43.7)	43(34.1)	
.	Are you aware of histology techniques?	Yes	48(32.4)	47(31.8)	53(35.8)	0.58
		No	45(27.4)	59(36)	60(36.6)	
.	How do you actually identify the slide?	From outside	11(39.3)	5(17.9)	12(42.9)	<0.01**
		From inside	30(33)	22(24.2)	39(42.9)	
		Both ways	40(27.2)	63(42.9)	44(29.9)	
		Never bothered	8(19)	16(38.1)	18(42.9)	
		Other	4(100)	0	0	

.	How well can you identify the features on a slide after seeing it for the first time?	Very well	18(27.3)	18(27.3)	30(45.5)	<0.01**
		Almost never	28(19.7)	62(43.7)	52(36.6)	
		Sometimes	47(45.2)	26(25)	31(29.8)	
.	Do you make an affort to read the topic before you see the slide?	Yes	43(45.3)	19(20)	33(34.7)	<0.01**
		No	25(18.5)	57(42.2)	53(39.3)	
		Sometimes	25(30.5)	30(36.6)	27(32.9)	
.	Do you make histological diagram for each slide?	Yes	66(31.6)	60(28.7)	83(39.7)	<0.05*
		No	27(26.2)	46(44.7)	30(29.1)	
0.	What is the main difficulty you encountered during practical exam?	Identification of slides	20(45.5)	6(13.6)	18(40.9)	<0.05*
		Drawing the diagrams	27(27.8)	34(35.1)	36(37.1)	
		Remembering the histopathological features	25(26.3)	41(43.2)	29(30.5)	
		All of the above	17(25.4)	21(31.3)	29(43.3)	
		Other	4(44.4)	4(44.4)	1(11.1)	
1.	What is your prime source of knowledge about the topics	Textbook	33(39.3)	18(21.4)	33(39.3)	<0.05*
		Notes	37(29.1)	45(35.4)	45(35.4)	
		internet	14(20.9)	30(44.8)	23(34.3)	
		None of the above	6(20)	13(43.3)	11(36.7)	
		Other	3(75)	0	1(25)	
2.	Have you attended seminars related to oral pathology topic?	Yes	37(25.9)	45(31.5)	61(42.7)	0.08
		No	56(33.1)	61(36.1)	52(30.8)	
3.	Does the usage of charts and models helps in understanding the topic better	Yes	77(36.8)	58(27.8)	74(35.4)	<0.01**
		No	16(15.5)	48(46.6)	39(37.9)	

	?					

DISCUSSION

A descriptive cross-sectional study was conducted to assess the orientation of dental students toward the subject of Oral Pathology and to identify key areas for enhancing the teaching-learning process. Oral Pathology plays a crucial role in training students to recognize and diagnose pathological conditions at a microscopic level, ultimately aiding in accurate treatment planning. The importance of this discipline in dental education cannot be overstated, as it forms the foundation for future clinicians to correlate clinical and histopathological findings effectively.[6]

In the present study, 79.17% of participants agreed that slides should be explained before they are focused, while 52.6% were unfamiliar with histological techniques. When questioned on how they identified slides, only 29.3% stated that their identification was based on histological content, whereas the remaining students relied on external markers. Additionally, 45.51% of students reported difficulty in identifying slide features upon their first observation. The major challenges faced during practical sessions included remembering histopathological diagrams (30.6%) and accurately drawing them (30.9%). These findings align with previous studies highlighting that dental students often struggle with histopathological interpretation due to the complexity of the subject and insufficient interactive learning resources.[7]

The integration of digital pathology and virtual microscopy into the curriculum has been proposed as a viable solution to enhance student engagement and comprehension. Studies have demonstrated that transitioning from conventional glass slides to digital slides significantly improved student interaction and knowledge retention.[8] Additionally, digital microscopy has been shown to provide a more efficient learning experience by allowing students to revisit slides at their convenience.[9] Incorporating animations, interactive modules, and case-based discussions could further stimulate interest in Oral Pathology and facilitate better understanding.[10]

Educational institutions must strive to modernize the curriculum while maintaining academic rigor. A blended approach combining traditional histopathology training with digital tools can bridge the gap between theoretical knowledge and practical application. This evolution in teaching methodology has the potential to foster a more engaging and effective learning environment for dental students.[11] By incorporating innovative teaching strategies, institutions can ensure that students develop a strong foundation in Oral Pathology, ultimately benefiting their clinical practice and patient care.[12]

A key limitation of this study is its reliance on self-reported responses, which may introduce bias due to individual perceptions and recall limitations. Additionally, the study was conducted within a specific geographic and academic setting, limiting the generalizability of the findings to other institutions or regions. Future research incorporating objective assessments and a larger, more diverse sample could provide a more comprehensive understanding of the challenges faced by dental students in studying Oral Pathology

CONCLUSION

This study highlighted the challenges encountered by dental students in learning oral pathology, emphasizing the need for innovative teaching methodologies. Integrating modern techniques such as digital histopathology, interactive animations, and virtual microscopy can enhance student engagement and facilitate a deeper understanding of microscopic structures. Additionally, incorporating case-based discussions and clinical correlations can help bridge the gap between theoretical knowledge and practical application, making the subject more relevant to future clinical practice. Strengthening interest in this field is essential, as it not only improves diagnostic skills but also encourages students to consider oral pathology as a promising career path, ultimately contributing to advancements in research and patient care.

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