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RESEARCH ARTICLE

Oral Biopsy: Evaluating Awareness and Knowledge Among Dental Students at University of Baghdad

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Abstract

Introduction: Oral biopsy is a fundamental diagnostic procedure in dentistry, essential for the early detection of oral cancer and other pathologies. While theoretical knowledge is a core component of dental education, the translation of this knowledge into clinical confidence and practical ability is critical for patient care. **Objective:** Evaluate the awareness, knowledge, and self-perceived ability to perform oral biopsies **Material and Methods:** A cross-sectional study was conducted among dental students. Participants (n=110) comprising 14 multiple-choice questions assessing key variables: knowledge of biopsy principles, techniques, lesion identification, specimen preservation, and ability to perform the procedure **Results:** While theoretical awareness was high (98% knew what a biopsy is), a significant gap existed with practical application. Only 16% of students felt confident performing a biopsy independently. The primary barriers were reliance on theoretical knowledge only (47%) and a lack of clinical training (37%). A statistically significant association was found between gender and the perceived ability to perform a biopsy (p=0.002). However, no significant correlation was found between academic stage (4th vs. 5th year) and practical ability (p=0.2). **Conclusion:** Dental students have a strong theoretical foundation in oral biopsy but report a significant deficit in practical, hands-on training and self-confidence. The findings highlight a critical need to reform the curriculum to include more clinical and simulation-based training to bridge this theory-practice gap and better prepare future dentists for this essential diagnostic responsibility.

Keywords: Clinical Competency, Curriculum Development, Dental Students, Knowledge Assessment, Oral Biopsy

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INTRODUCTION

Oral cancer remains a significant global health concern, characterized by its potential for high morbidity and mortality when not diagnosed and treated at an early stage. The most critical tool for diagnosis of suspicious oral lesions, ranging from precancerous conditions to malignancies, is the oral biopsy.[1,2] Biopsy is the removal of a tissue sample from a living body with the objective of providing the pathologist with a representative, viable specimen for histopathologic interpretation and diagnosis. This approach is used for all tissues of the body, including those of the oral cavity, where a wide spectrum of disease processes may present. The dental clinician should be aware of the various biopsy techniques that are available for the oral tissues, as well as the challenges specific to these tissues.[3,4.]

For dental students, the transition from theoretical knowledge to clinical skill is important. Moreover, their education must prepare them not only with the technical skills to perform a biopsy but also with the clinical judgment to recognize lesions that require such an investigation.[5]

However, lack of awareness or knowledge in this critical area can lead to delayed diagnosis, misdiagnosis, and eventually, poorer patient outcomes. Therefore, evaluating the preparation of future dentists is essential to ensure the efficacy of dental programmes in meeting contemporary healthcare challenges.[6,7]

Additionally, assessing the awareness and knowledge of its dental students regarding oral biopsies provides invaluable insight into the strengths and potential gaps in the educational program. This study, therefore, aims to evaluate the awareness and knowledge of oral biopsy among dental students at the University of Baghdad. The findings will serve as a crucial standard for curriculum development, potentially identifying areas for enhanced training and educational interventions to better prepare students for this vital aspect of clinical responsibility and, ultimately, improve early detection and management of oral diseases.

METHODS

This study was a cross-sectional study, which was conducted among the clinical students at Baghdad University College of Dentistry. Students were contacted and given all the information about the study and they were asked to participate on a voluntary basis. All the participants were fully informed about the aims of the study and about the confidentiality of the data and they were also assured that the data would be used only for the purpose of the research and that their refusal to participate would not affect their current and future courses of study in any way. Every precaution was taken to protect the privacy of research subjects and the confidentiality of their personal information.

The questionnaire consisted of 14 multiple choice questions. Data was depend on the following variables:

- Oral Biopsy knowledge
- Oral biopsy techniques
- Ability to perform oral biopsy
- Reasons for not performing biopsy
- Knowledge on lesions that require oral biopsy
- Preservation of biopsy sample

Statistical analysis

Once the students answered the questionnaire, the data obtained from the survey were analysed using statistical sciences (SPSS) version 26 The set of *p*-value of <0.05 with a 95% confidence interval was considered statistically significant.

RESULTS

A total of 110 students responded to the questionnaire. Demographic Information revealed that females accounted for 74% of the total and males accounted for 26%. Moreover, the distribution of participants by their academic stage. Students in the 5th stage dominated the sample (74%), compared to 26% from the 4th stage.

A high percentage (98%) of students knew what an oral biopsy is, but fewer may have performed one. The ability to perform biopsies and proper specimen labeling/site documentation might show lower percentages, indicating gaps in practical training. Figure1

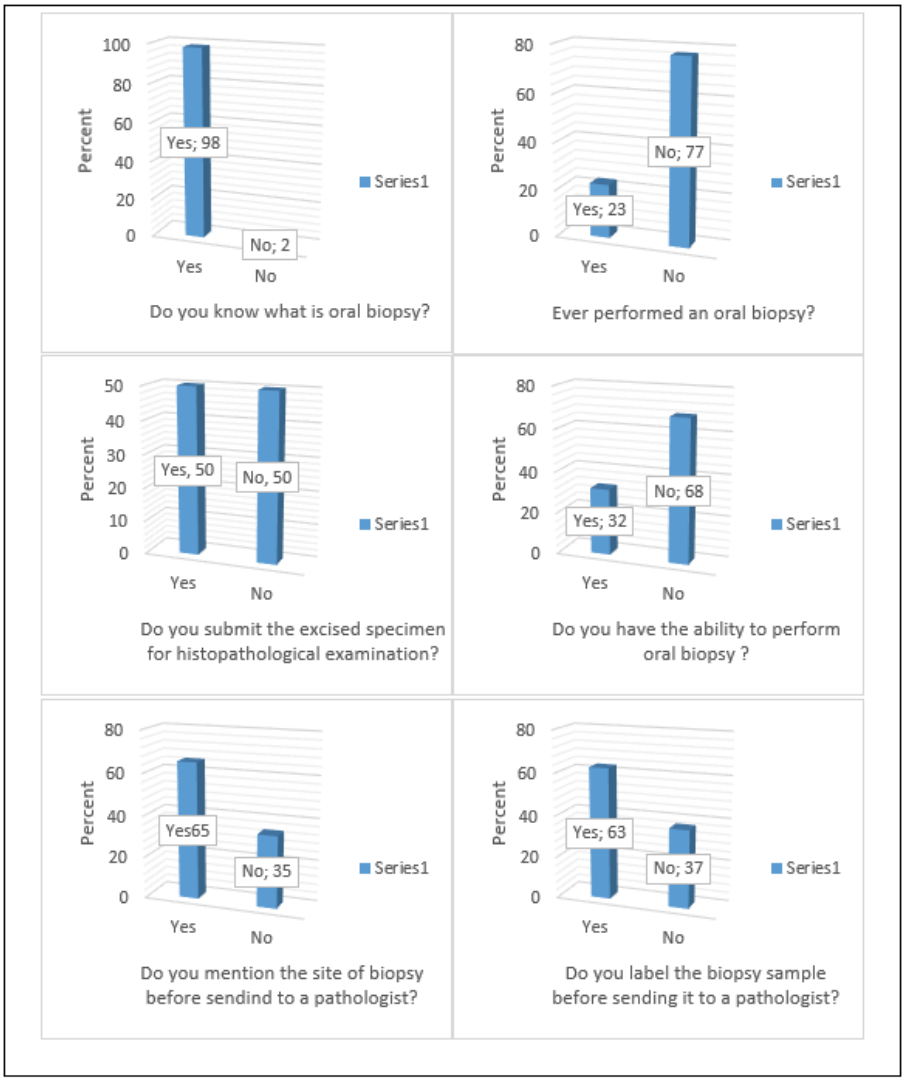

Figure 1 *Knowledge about Oral Biopsy among dental students*

The findings revealed that “theoretical-only knowledge” dominates 47%, followed by "Lack of clinical training" 37%, and reliance on specialists 16%. Figure 2

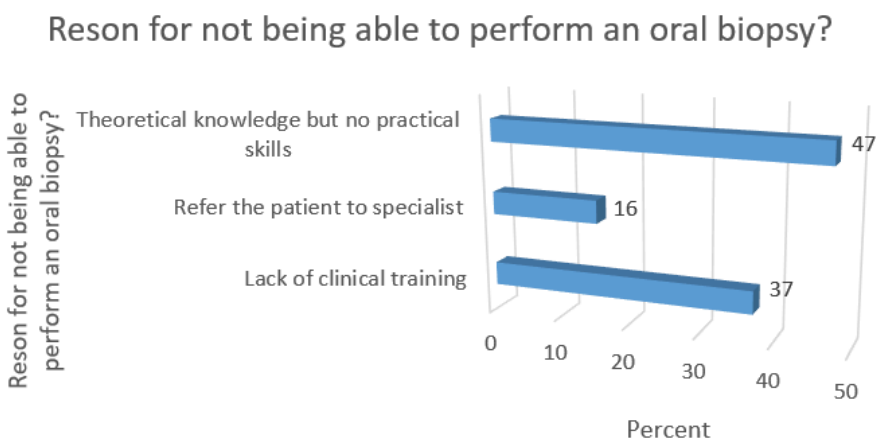

Figure 2 *Knowledge on reasons for not being able to perform an oral biopsy.*

Most students may prefer referring patients or consulting specialists, reflecting low self-efficacy. Fewer students (16%) might feel confident performing biopsies independently. Figure 3

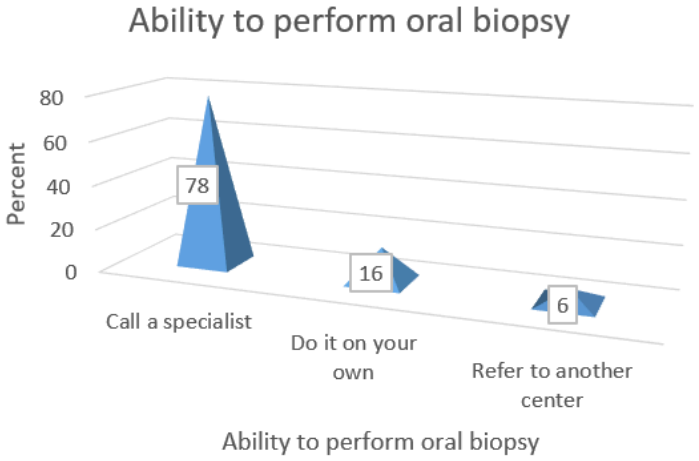

Figure 3 *Knowledge on ability of dental students to perform oral biopsy*

A majority (78%) might " Send it for analysis always, indicating adherence to protocols. Figure 4

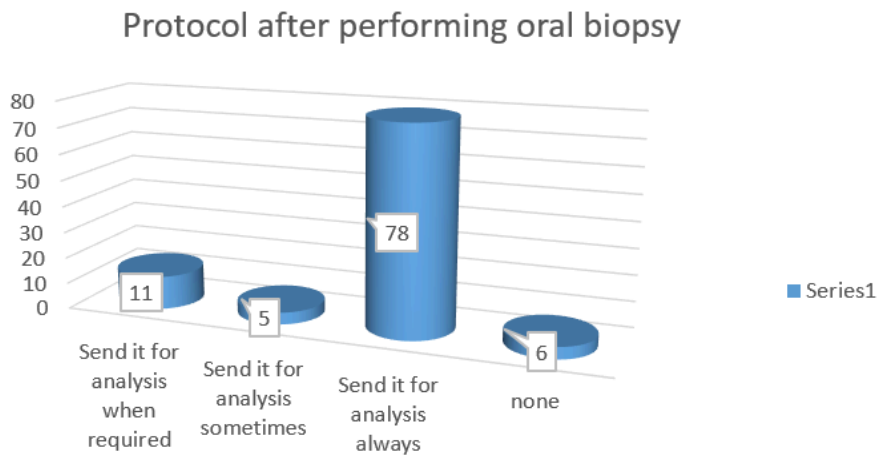

Figure 4 *Attitude of dental students on protocol after performing Oral Biopsy*

The result revealed that formalin (the gold standard) was selected by 67% of students, with some students selecting saline or alcohol less than 5%. Figure 5

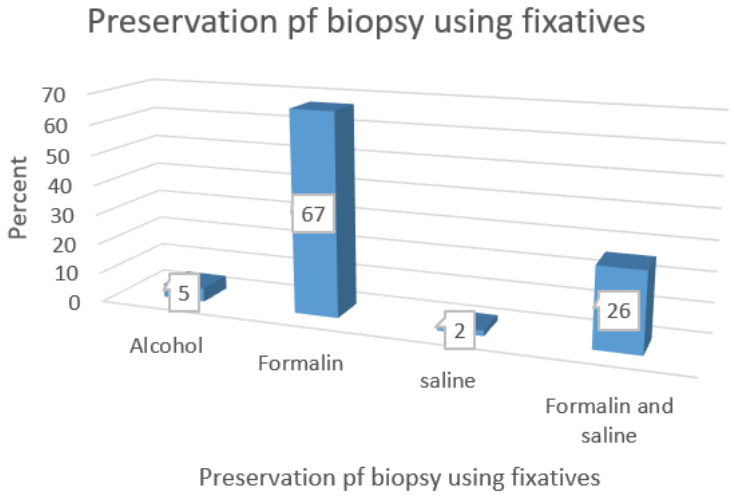

Figure 5 *Knowledge of dental students on preservation of Biopsy using Fixatives*

A high percentage (88%) correctly select "all of the above," demonstrating awareness of indications. However, 7% focusing only on malignant lesions. Figure 6

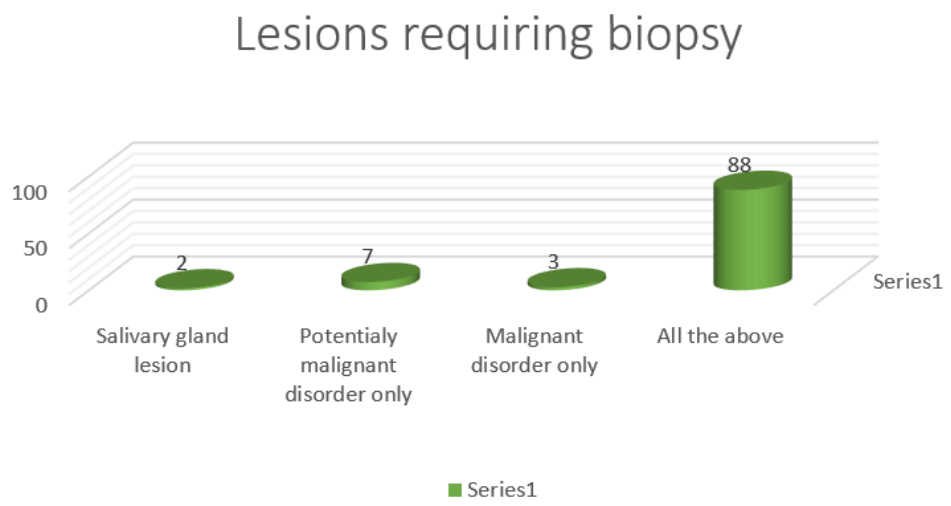

Figure 6 *Knowledge of dental students on Lesions requiring biopsy*

Most students (44%) may recognize "both" core and periphery as ideal, aligning with best practices for comprehensive sampling. While 39% think it only from periphery of lesion. Figure 7

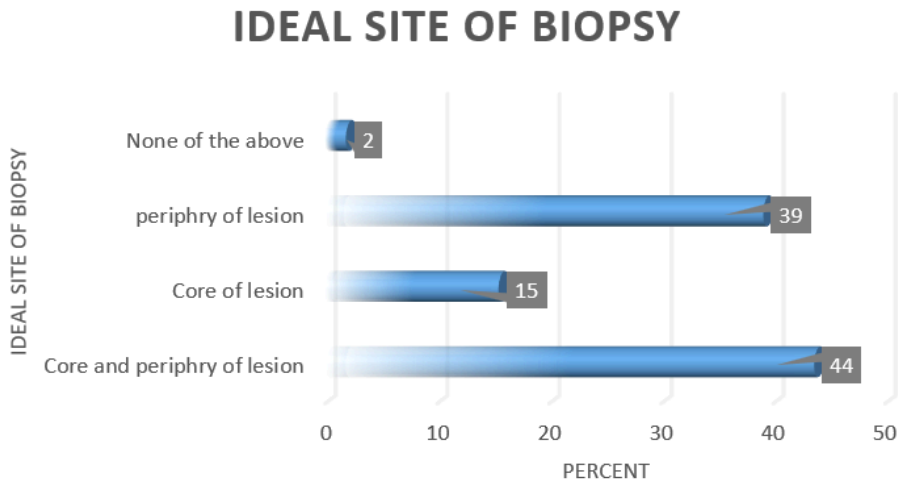

Figure 7 Knowledge of dental students on ideal site of biopsy.

Chi-Square Test

The association between two categorical variables (gender and ability to perform an oral biopsy, high significant correlation (*p* value 0.002) table 1.

Table 1 *The association between gender and ability to perform an oral biopsy*

Chi-Square Tests				
	Value	*df*	*Asymptotic Significance (2-sided)*	*Exact Sig. (1-sided)*
Pearson Chi-Square	*9.901*[a]	*1*	*.002*	
Continuity Correction[b]	*8.493*	*1*	*.004*	
Likelihood Ratio	*9.469*	*1*	*.002*	
Fisher's Exact Test				*.002*
Linear-by-Linear Association	*9.811*	*1*	*.002*	
N of Valid Cases	*110*			

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.23.

Correlation Analysis

To determine if there is a statistical relationship between two continuous variables, the association between education stage and the ability to perform an oral biopsy. Kendall's tau test showed that no significant correlation between two variables p 0.2. table 2

Table 2 *The association between education stage and the ability to perform an oral biopsy.*

Correlations				
			Stages	*Do you have the ability to perform oral biopsy ?*
Kendall's tau_b	*Stages*	*Correlation Coefficient*	*1.000*	*.054*
		Sig. (1-tailed)	*.*	*.285*
		N	*110*	*110*

DISCUSSION

A biopsy involves taking a small sample of tissue to examine it for diagnosis. Today, both dentistry and medicine rely heavily on evidence-based approaches to guide treatments and improve patient results. For this reason, dentists should be skilled in performing basic oral biopsies to properly diagnose suspicious mouth lesions. However, studies show that most dentists worldwide don't actually perform biopsies in their daily practice.[8]

Despite being aware of the importance of biopsy as a crucial diagnostic procedure, not many

dentists perform it routinely due to reasons such as lack of training, patient non compliance and medicolegal implications.[9]

The findings of this study shed light on critical aspects of oral biopsy knowledge, practical competencies, and attitudes among dental students at Baghdad University, offering valuable insights for curriculum enhancement and clinical training.

While an overwhelming majority (98%) of students demonstrated theoretical awareness of oral biopsies, a notable disparity exists between knowledge and practical application. The low self-reported ability to perform biopsies, coupled with inadequate specimen labeling and site documentation, underscores a systemic gap in hands-on training. This aligns with global studies indicating that dental education often emphasizes theoretical instruction over clinical skill development, leaving students underprepared for real-world procedures.[10]

The primary barriers to performing biopsies, reliance on theoretical knowledge (47%) and insufficient clinical training (37%), this highlight curricular shortcomings. This finding agree with the finding of wong et all, that missing clinical information and inadequate specimens are common and adversely affect the quality of care.[11]

Moreover a study by Diamanti, N., *et al* which concluded that Both specialists on the dental surgical registers and GDPs feel there is a need for further training in biopsy technique for GDPs.[12]

The significant association between gender and biopsy ability (p=0.002) this agree with a study by Almohefer., *et al*. the level of confidence during clinical therapy, compared to the female and senior students, the male interns and students reported higher confidence.[13]

Additionally, Bartlett et al. found there was higher confidence among male dental students compared to female in undertaking surgical extractions.[14]

The absence of correlation between education stage (4^{th} vs. 5^{th} year) and biopsy ability suggests that current training modalities do not sufficiently enhance practical skills as students advance. This highlight the need for a restructuring of clinical modules to ensure progressive skill development, mirroring recommendations from institutions where longitudinal clinical rotations improve procedural mastery.

On other hand, students exhibited knowledge in critical areas: 88% recognized all lesion types requiring biopsy, and 67% identified formalin as the gold-standard fixative. This indicates effective foundational teaching in diagnostic criteria and specimen handling protocols. However, persistent confusion about biopsy site selection (39% favoring periphery-only vs. 44% recognizing both core and periphery) signals a need for targeted education on comprehensive sampling techniques. A study by Kumaraswamy, *et al*; found many artifacts in the tissue specimen because of poor biopsy technique or handling, which has led to diagnostic pitfalls and misery to both the patient and the clinician.[15]

CONCLUSION

The results highlight the need to direct dental education toward experiential learning. By addressing gaps in clinical training and focusing on hands-on practice, institutions can train future dentists with the confidence and competence required for effective patient care.

ACKNOWLEDGEMENT

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CONFLICT OF INTEREST:

The authors declare no conflict of interest. No funding was received for this study.

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