

<https://doi.org/10.48047/AFJBS.6.10.2024.4302-4315>



## African Journal of Biological Sciences



Research Paper

Open Access

### Evaluation Factors Influence the Decision for Simple Tooth Extraction among Dental Students, Interns, and General Practitioners

Ghassan Darwish\*

Oral and Maxillofacial Surgery Department, College of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia

\*Corresponding author: Ghassan Darwish, Oral and Maxillofacial Surgery Department, College of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia [gdarwish@kau.edu.sa](mailto:gdarwish@kau.edu.sa)

Article History Volume 6, Issue 10, 2024

Received: 28 Apr 2024

Accepted: 06 May 2024

doi: 10.48047/AFJBS.6.10.2024.4302-4315

#### Abstract:

**Objective:** This cross-sectional study aimed to assess the knowledge and decision-making processes of dental students, interns, and general practitioners regarding tooth extraction methods. **Methods:** A questionnaire was distributed online to 113 participants, including fifth and sixth-year dental students, interns, and general practitioners at King Abdulaziz University Hospital. The questionnaire evaluated participants' awareness of numerous factors influencing the decision for simple versus surgical tooth extraction, including tooth-related, prosthodontic, periodontic, and endodontic factors. **Results:** Showed that while the majority demonstrated good decision-making based on their knowledge and experience, variations existed, particularly among dental students, due to differing levels of understanding. Despite some discrepancies, participants agreed on factors contributing to simple tooth extraction. **Conclusion:** The study highlights the importance of continuous education and training to enhance practitioners' competency in tooth extraction decision-making, improving patient care and treatment outcomes. Limitations included the small sample size of general dentists and the focus on a single institution, suggesting the need for larger-scale studies for generalizability.

**Keywords:** Tooth extraction, General Practitioner, Simple extraction, Surgical extraction, Evaluation factors.

## Introduction

Dental students, interns, and general practitioners do simple tooth extraction using elevators and dental forceps under local anesthesia. Simple tooth extraction is usually done for orthodontic teeth extraction, periodontally involved teeth, requiring little time for recovery; on the contrary, surgical tooth extraction requires tooth sectioning or bone removal using a dental hand-piece to facilitate the removal of teeth under local anesthesia, and the oral and maxillofacial surgeon should carefully and skillfully do it to assess the knowledge and decision among questioners about when they consider the tooth simple for extraction, also to evaluate factors which can influence the decision for simple tooth extraction among students, interns and general practitioners, such as periodontally involved teeth, root canal-treated teeth, multi-rooted teeth, and thick bone density. So, both clinical and radiographic evaluation should be utilized to decide on tooth extraction. The significance of this study is to assess the awareness among dental students, interns, and general practitioners about when they consider the tooth simple to extract and to simplify the decision-making. Also, the ease of preparation of the armamentarium before tooth extraction is essential to improve patient care. We want to know if fifth-year and sixth-year dental students, dental interns, and general dentists can determine if the teeth extraction will be simple or surgical based on the evaluation factors.

As described by Sambrook and Goss (2018), Exodontia is a standard daily procedure encompassing various scenarios such as orthodontic extraction or extraction for a prosthodontic plan. It requires skilled dentists to ensure a painless experience for the patient. Diagnosis, techniques, and potential complications must be thoroughly considered, whether performing simple or surgical extraction. The diagnostic process involves a comprehensive patient history assessment, examination, and pre-extraction radiographs. Factors beyond the tooth itself, such as the patient's overall health and any complicated conditions, must be considered, including managing medically compromised patients. Other factors, such as cemental hyperplasia or condensing osteitis, may further complicate the extraction process. Dym and Weiss (2012) emphasize the importance of dentists being well-prepared and confident when undertaking exodontia procedures. Mastery of clinical skills, knowledge, and surgical equipment is essential to deliver teeth extraction with minimal trauma. Simple and complicated extraction techniques and instruments are discussed, including innovative tools like peristomes and piezo surgery to facilitate atraumatic extraction and enhance outcomes. Dentists equipped with comprehensive training and expertise in Exodontia are better poised to predict and manage extraction outcomes effectively. Tolentino et al. (2019) conducted a study focusing on clinical and radiographic decision-making for tooth extraction in patients with periodontal disease. The research involved general dentists and periodontologists evaluating their approaches in specific cases. Periodontologists tended to opt for tooth retention more frequently than general dentists. Factors influencing extraction decisions included the severity of periodontal disease, poor oral hygiene, and inadequate alveolar bone structure. This study underscores the importance of a thorough clinical and radiographic examination in determining whether to preserve or extract teeth affected by periodontal disease. Nayyar et al. (2015) conducted a literature review study

discussing evidence-based approaches to managing retained root fragments encountered during extraction. The prevalence of retained root fragments ranges from 11% to 37%. Factors influencing the decision to extract or retain these fragments include vitality and potential infection. The decision-making process should weigh the risk-benefit ratio for each case, considering factors such as periapical health and the need for future prosthodontic treatment. Lee et al. (2020) investigated dentists' decision-making processes regarding teeth with apical periodontitis.

The study revealed that dentist-related factors, including gender, experience, specialty, and tooth-related factors, such as position and root canal status, significantly influenced extraction decisions. General dental practitioners tended to lean towards extraction more frequently than specialists. This highlights the multifaceted nature of decision-making in dental practice and the need for tailored approaches based on numerous factors. Mecler et al. (2022) examined the role of professional expertise in decision-making concerning periodontally compromised teeth. Dental students and experienced dentists were presented with scenarios involving radiographs to determine whether to maintain or extract the affected teeth. Despite the differing experience levels, the decision to maintain the teeth was consistent across both groups. However, the study suggests that years of experience influence decision-making processes.

Several studies shed light on various aspects of tooth extraction procedures and their associated challenges. Almasri (2019) conducted a study analyzing the causes behind referring root canal-treated teeth to oral surgery for extraction. Their findings highlighted that molars were commonly extracted due to subgingival decay, while premolars were extracted mainly due to vertical root fractures. This underscores the importance of a cautious approach toward endodontically treated molars and premolars, which are frequently encountered in oral surgery clinics. Vadane (2017) presented a case report illustrating the difficulties in extracting root canal-treated upper second molars. Endodontically treated teeth are predisposed to extraction due to complications such as vertical root fractures or non-restorable caries. Careful radiographic examination is essential to anticipate potential complications during extraction, as demonstrated in the challenging extraction of a maxillary second molar with minimal trauma.

In a retrospective study by Park (2016), efforts were made to identify factors contributing to the difficulty in surgically extracting impacted lower molars. While various preoperative evaluation methods have been proposed, predicting extraction difficulty remains challenging. Computed tomography is commonly utilized to assess impacted tooth position, highlighting the ongoing dilemma in accurately predicting extraction complexities. Shareef et al. (2020) investigated the causes and patterns of permanent tooth extraction, analyzing factors such as dental caries, periodontal problems, trauma, orthodontic treatment, and endodontic failures. The study found dental caries to be the leading cause of tooth extraction, with molars being the most frequently extracted teeth. The research also noted an increased number of first premolars extracted due to orthodontic treatment. Edward et al. (2017) conducted a randomized controlled trial introducing a novel extraction technique for maxillary third molars. This technique proved less traumatic, with fewer complications and reduced procedure time than conventional methods. Such

advancements are crucial in improving patient outcomes and minimizing post-operative complications. Alenazi et al. (2021) explored the knowledge of post-extraction complications among male senior dentists and interns, finding that those from government colleges generally had better awareness. This underscores the importance of education and training in enhancing practitioners' competency in managing post-extraction complications. Brand et al. (2015) examined European dental school students' perceptions regarding theoretical and practical tooth extraction training. The study revealed variations in teaching methods among dental schools, potentially leading to differing competency levels among graduating dentists. Finally, studies by Nasreen and Haq (2013) and Hong et al. (2018) investigated factors affecting tooth extraction among adult patients and compared conventional extraction methods with vertical extraction systems. Nasreen's study highlighted dental caries as the most common cause of extraction, with economic factors also playing a significant role. Hong's research demonstrated the efficacy of vertical extraction systems in managing badly damaged teeth, potentially reducing the need for flap surgery. These studies collectively contribute to understanding the complexities and advancements in tooth extraction. Most studies focused on the factors associated with tooth extraction (dental care was the most important factor, followed by periodontally compromised teeth). Some studies explained the teeth factors that contributed to the difficulty in extraction among dental students and dentists, such as endodontic treated teeth with or without vertical root fractures and treated endodontic teeth with or without subgingival decay. Some were comparing the techniques that could be more relevant. So, mastering exodontia knowledge, technique, and equipment with a proper radiographic evaluation should be considered before tooth extraction to influence decision-making about when to view the tooth simply for extraction.

The study's objective is to assess the knowledge and decisions of dental students, interns, and general practitioners to know which tooth extraction method could be used upon evaluation. We aim to know if the evaluation factors will or will not affect the dentist's decision on the method of tooth extraction. Unfortunately, no study has been done about the association between knowledge and awareness of the factors among dental students and dentists, so we need further studies to show the association between this controversial topic. This study aims to fill in the information not discussed in previous studies.

## **Materials and Methods**

This cross-sectional study assesses a group difference among fifth-year and sixth-year dental students, dental interns, and general practitioners. The dependent outcome is awareness of the evaluation factors, and the independent outcome is not aware of the evaluation factors. The study was conducted in the Department of Oral and Maxillofacial Surgery at King Abdulaziz University Hospital (KAUDH) between January and April 2023. The ethical approval for the study was obtained by the Research Ethics Committee of the Faculty of Dentistry (REC-FD) at King Abdulaziz University in January 2023. An online questionnaire was sent to participants from the fifth-year and sixth-year dental students, dental interns, and general practitioners at KAU Dental Hospital to recognize the factors before the decision to do tooth extraction. The exclusion criteria are students who have not yet been introduced to the subject of essential oral

surgery. We will assess the validity and reliability of the questionnaire based on the evaluation factors mentioned in previous articles; also, the same questionnaire will be provided for oral and maxillofacial surgery faculty and will be used as a rubric. This study was introduced to the participants who agreed to participate by signing a consent form before participating and clicking the Agree button at the beginning of the survey.

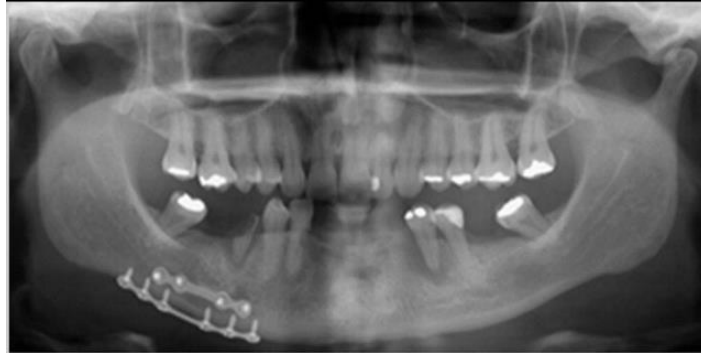
The questionnaire contains 12 multiple-choice close-ended questions designed from previously published articles to evaluate the awareness of the numerous factors that will affect their decision for simple versus surgical tooth extraction; these factors include tooth-related factors, prosthodontic factors, periodontic factors, and endodontic factors. The questionnaire is divided into three sections: the first section includes demographic data of the participants, the second section includes 5 questions about knowledge, and the third section includes seven questions, including cases related to anatomy, prosthodontics, periodontics, and endodontic factors. The questions were mainly made to recognize these factors in detail: A) Tooth-related factors: 1- Anatomy of the root. 2- Dilaceration of the root. 3- Bone density. 4- Hypercementosis of the root. B) Prosthodontic factors: 1- Restorability of the tooth. 2- Crown-root ratio. C) Periodontic factors: 1- Increase mobility. 2- Presence of periapical lesion. 3- Furcation involvement. 4- Widening of PDL space. 5- Increased probing depth. D) Endodontic factors: 1- Root canal-treated teeth. 2- Time since obturation. 3- Periapical radiolucency. The measurements we are using in the study are based on the evaluation factors mentioned in previous articles. The same questionnaire was sent to the oral and maxillofacial surgery faculty and used as a rubric. 113 participants responded to the survey sent online, and data were coded and entered into spreadsheet software and analyzed using Chi-square tests.



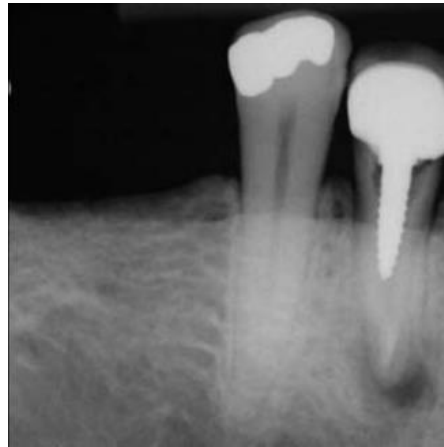
*Figure 1: First case used for the questionnaire.*



*Figure 2: The second case used for the questionnaire.*



*Figure 3: Third case used for the questionnaire.*



*Figure 4: Fourth case used for the questionnaire.*



*Figure 5: Fifth case used for the questionnaire.*

## **Results**

One hundred thirteen participants responded to the demographic characteristics of the study participants in Table 1. 29 (25.7%) of the participants were 22-23 years old, 46 (40.7%) were 24-25 years old, 38 (33.6%) were 26 years old or more. 64 (56.6%) were females, 49 (43.4%) were males, and according to their position, 21(18.6%) were fifth dental students, 26 (23%) were sixth

dental students, 55 (48.7%) were dental interns, 6 (5.3%) were general dentists, 5 (4.4%) were oral and maxillofacial surgery faculty. Table 2 shows knowledge-based questions by position. Participants included 5 from the oral and maxillofacial surgery faculty, 6 general dentists, 51 from interns, 22 from the sixth year, and 18 from the fifth year who agreed that dental care is the most common reason for tooth extraction. Meanwhile, (3) 5.5% of the interns, (4) 15.4% of the sixth year, and (2) 9.5% of the fifth year agreed that periodontal disease is the most common reason for tooth extraction. (1) 4.8% of fifth-year agreed that failure of root canal treatment is the most common reason for extraction, (1) 1.8% of dental interns agreed that trauma is the common reason for tooth extraction, some variability was noticed among fifth, sixth year dental students and interns due to lack of knowledge, (p-value = 0.711 ) statistically insignificant. For the second question, all oral and maxillofacial surgeons 5 (100%), 5 (83.3%) general dentists, 52 (94.5%) dental interns, 20 (76.9%) of the sixth year, 20 (95.2%) fifth-year dental students agreed on the dilacerated root May complicate the tooth extraction and the answer was statistically significant (p-value = 0.034). For the third question, 3 (60%) oral and maxillofacial surgeons, 1 (16.7%) general dentists, 24 (43.6%) dental interns, 15 (57.7%) sixth-year, 13 (61.9%) fifth year dental students agreed to take a periapical radiograph to evaluate the tooth before extraction while 2 (40%) of oral and maxillofacial surgeons, 2 (33.3%) of general dentists, 29 (52.7%) of dental interns, 11 (42.3%) of the sixth year, 8 (38.1%) of fifth year dental students agreed to take a panoramic radiograph to evaluate the tooth before extraction, the question was statistically significant with (p-value = 0.001) minority agreed to take bitewing radiograph before tooth extraction which is lack of knowledge from 2 (3.6%) of dental interns, 3 (50%) of general dentists. For the fourth question, 4 (80%) oral and maxillofacial surgeons, 6 (100%) general dentists, 42 (76.4%) dental interns, 23 (88.5%) sixth-year, 19 (90.5%) fifth year agreed on vertical root fracture May complicate the tooth extraction in endodontic treated molars and premolars while, 1 (20%) of oral and maxillofacial surgeons, 13 (23.6%) of dental interns, 3 (11.5%) of sixth-year dental students, 2 (9.5%) disagreed on vertical root fracture May complicate the tooth extraction in endodontic treated molars and premolars, (p-value = 0.355) statistically insignificant. For fifth question, 4 (80%) of oral and maxillofacial surgeons, 5 (83.3%) of general dentists, 3 (96.4%) of dental interns, 25 (96.2%) of the sixth year, 16 (76.2%) of the fifth year agreed on subgingival decay may complicate the tooth extraction in endodontic treated molars and premolars while 1(20%) of oral and maxillofacial surgeons, 1 (16.7%) of general dentists, 2 (3.6%) of dental interns, 1 (3.8%) of sixth year, 5 (23.8%) of fifth year dental student disagreed on subgingival decay may complicate the tooth extraction in endodontic treated molars and premolars, statistically significant with (p-value = 0.046 ).

In Table 3, case-based questions and answers from participants are presented. For the first case (Figure 1), all oral and maxillofacial surgeons 5 (100%), 5 (83.3%) of general dentists, 39 (70.9%) of dental interns, 17 (65.4%) of the sixth year, 17 (81%) of fifth year dental students agreed that extraction of tooth #12 would be surgical due to the hypercementosis, while 10 (18.2%) of dental interns, 5 (19.2%) of sixth year, and 3 (14.3%) of fifth year dental students answered the question with simple tooth extraction, and rest of general dentists 1 (16.7%), 6

(10.9%) of dental interns, 4 (15.4%) of sixth year, 1 (4.8%) of fifth year dental student they don't know the right answer. P value = 0.745, which is statistically insignificant. For second case (figure 2), all oral and maxillofacial surgery faculty 5 (100%), all general dentists 6 (100%), 53 (96.4%) dental interns, 25 (96.2%) of the sixth year, and all fifth year dental student 21 (100%) agreed that the mobility due to bone loss may contribute to simple extraction of the lower anterior, while 1 (1.8%) of dental interns and 1 (3.8%) of sixth year dental student agreed that radiolucent lesion may contribute to simple extraction of lower anterior, only 1 (1.8%) of dental interns answered that deep restoration may contribute to simple extraction of lower anterior. P value = 0.971, which is statistically insignificant. For the third case (figure 3), 4 (80%) oral and maxillofacial surgeons, 6 (100%) general dentists, 37 (76.3%) dental interns, 17 (65.4%) of the sixth year, 16 (76.2%) of fifth year dental students agreed that tooth #45 most likely to be delivered by simple tooth extraction while 1 (20%) of oral and maxillofacial surgeons, 18 (32.7%) of dental interns, 9 (34.6%) of sixth year, 5 (23.9%) of fifth year dental students agreed that tooth #45 most likely to be delivered by surgical tooth extraction. P value = 0.452, which is statistically insignificant. For the fourth case (figure 4). 5 (100%) of oral and maxillofacial surgeons, 5 (100%) of general dentists, 5 (83.3%) of general dentists, 34 (61.8%) of dental interns, 13 (50%) of the sixth year, 13 (61.9%) of fifth year dental students agreed that tooth #43 most likely to be delivered by surgical tooth extraction while, 1 (16.7%) of general dentists, 21 (38.2%) of dental interns, 13 (50%) of sixth year, 8 (38.1%) of fifth year dental students agreed that tooth #45 most likely to be delivered by simple tooth extraction. P value = 0.214, which is statistically insignificant. For the fifth case (figure 4), all oral and maxillofacial surgeons 5 (100%), 4 (66.7%) of general dentists, 2 (76.4%) of dental interns, 18 (69.2%) of the sixth year, 13 (61.9%) of fifth year dental students agreed about the large custom made post being a factor for their previous decision. P value = 0.393, which is statistically insignificant. Sixth case-based question, figure 5. All oral and maxillofacial surgeons 5 (100%), 6 (100%) general dentists, 47 (85.5%) dental interns, 18 (69.2%) of the sixth year, 18 (85.7%) of fifth-year dental students agreed that tooth #47 will be delivered by surgical extraction, while only 8 (14.5%) of dental interns, 8 (30.8%) of sixth year, 3 (14.3%) of fifth year dental students answered surgical extraction for tooth #47. P value = 0.189, which is statistically insignificant. For the seventh case (figure 5), 3 (60%) oral and maxillofacial surgeons, 5 (83.3%) general dentists, 18 (32.7%) dental interns, 11 (2.3%) in the sixth year, 6 (28.6%) of fifth year dental students think that the radiolucent area at the furcation of tooth#47 being a factor for their previous decision. sixth year%) of oral and maxillofacial surgeons, 1 (16.7%) of general dentists, 15 (27.3%) of dental interns, 5 (19.2%) of the sixth-year, 10 (47.6%) of fifth-year dental students think that poor root canal treatment of #47 is the factor for their previous decision, 1 (20%) of oral and maxillofacial surgeons, 2 (40%) of dental interns, 10 (38.5%) of the sixth year, 5 (23.8%) of fifth year dental students think that open crown margin at tooth #47 is a factor for their previous decision. P value = 0.127, which is statistically insignificant. The results were analyzed using Chi-square tests, showing that the majority made good decisions based on their knowledge and experience; also,



the majority agreed on the factors contributing to simple tooth extraction, while some disagreed due to their lack of knowledge.

**Table 1:** Demographic characteristics of the participants

Demographics	categories	n (%)
Age	Mean ± SD in years	25.4 ± 5.5
	22 – 23 years	29 (25.7)
	24 – 25 years	46 (40.7)
	26 years or more	38 (33.6)
Gender	Female	64 (56.6)
	Male	49 (43.4)
Position	fifth-year dental student	21 (18.6)
	sixth-year dental student	26 (23.0)
	Dental intern	55 (48.7)
	General Dentist	6 (5.3)
	OMFS faculty	5 (4.4)

**Table 2:** Questions related to knowledge

		fifth	sixth	intern	Gen Dent	OMFS	p-value
Which of the following is the most common reason for tooth extraction?	Dental caries	18 (85.7)	22 (84.6)	51 (92.7)	6 (100)	5 (100)	0.711
	Failure of root canal treatment	1 (4.8)	0	0	0	0	
	Periodontal disease	2 (9.5)	4 (15.4)	3 (5.5)	0	0	
	Trauma	0	0	1 (1.8)	0	0	

Which of the following may complicate tooth extraction?	Large periapical radiolucency	1 (4.8)	1 (3.8)	3 (5.5)	0	0	<b>0.034*</b>
	Dilacerated root	20 (95.2)	20 (76.9)	52 (94.5)	5 (83.3)	5 (100)	
	Widening of PDL space	0	0	0	0	0	
	Furcation involvement	0	5 (19.2)	0	1 (16.7)	0	
What type of radiograph should be taken to evaluate the tooth before extraction?	Periapical radiograph	13 (61.9)	15 (57.7)	24 (43.6)	1 (16.7)	3 (60.0)	<b>&lt;0.001*</b>
	Panoramic radiograph	8 (38.1)	11 (42.3)	29 (52.7)	2 (33.3)	2 (40.0)	
	Bitewing radiograph	0	0	2 (3.6)	3 (50.0)	0	
Vertical root fracture may complicate tooth extraction in endodontic-treated molars and premolars	Agree	19 (90.5)	23 (88.5)	42 (76.4)	6 (100)	4 (80.0)	0.355
	Disagree	2 (9.5)	3 (11.5)	13 (23.6)	0	1 (20.0)	
subgingival decay may complicate tooth extraction in endodontic-treated molars and premolars	Agree	16 (76.2)	25 (96.2)	3 (96.4)	5 (83.3)	4 (80.0)	<b>0.046*</b>
	Disagree	5 (23.8)	1 (3.8)	2 (3.6)	1 (16.7)	1 (20.0)	

\* statistically significant

Table 3: Case-based questions related to specialty factors

		fifth	sixth	intern	Gen Dent	OMFS	p-value
Radiographic evaluation of tooth #12 revealed hypercementosis of the root, tooth most likely to be:	Simple tooth extraction	3 (14.3)	5 (19.2)	10 (18.2)	0	0	0.745
	Surgical tooth Extraction	17 (81.0)	17 (65.4)	39 (70.9)	5 (83.3)	5 (100)	
	I do not know	1 (4.8)	4 (15.4)	6 (10.9)	1 (16.7)	0	
Which of the following reasons may contribute to simple extraction of the lower anterior	Mobility due to bone loss	21 (100)	25 (96.2)	53 (96.4)	6 (100)	5 (100)	0.971
	Radiolucent lesion	0	1 (3.8)	1 (1.8)	0	0	
	Deep restoration	0	0	1 (1.8)	0	0	
Tooth #45 most likely to be delivered by	Simple tooth extraction	16 (76.2)	17 (65.4)	37 (76.3)	6 (100)	4 (80.0)	0.452
	Surgical tooth Extraction	5 (23.8)	9 (34.6)	18 (32.7)	0	1 (20.0)	
Tooth #43 most likely to be delivered by	Simple tooth extraction	8 (38.1)	13 (50.0)	21 (38.2)	1 (16.7)	0	0.214
	Surgical tooth Extraction	13 (61.9)	13 (50.0)	34 (61.8)	5 (83.3)	5 (100)	
What are the factors affecting your decision	Poor root canal treatment	0	4 (15.4)	3 (5.5)	1 (16.7)	0	0.393
	Radiolucent lesion related to the apex of the root	3 (14.3)	1 (3.8)	4 (7.3)	1 (16.7)	0	
	Large custom-made post	13 (61.9)	18 (69.2)	2 (76.4)	4 (66.7)	5 (100)	
	The gap between the crown and tooth structure	5 (23.8)	6 (10.9)	6 (10.9)	0	0	
Tooth #47 most likely to be delivered by	Simple tooth extraction	3 (14.3)	(30.8)	8 (14.5)	0	0	0.189
	Surgical tooth	18	18	47	6 (100)	5 (100)	

	Extraction	(85.7)	(69.2)	(85.5)			
What are the factors affecting your decision	Poor root canal treatment	10 (47.6)	5 (19.2)	15 (27.3)	1 (16.7)	1 (20.0)	0.127
	Radiolucent area at the furcation	6 (28.6)	11 (2.3)	18 (32.7)	5 (83.3)	3 (60.0)	
	Open crown margin	5 (23.8)	10 (38.5)	2 (40.0)	0	1 (20.0)	

## Discussion

The study aimed to find the association between the awareness of the evaluation factors and decision-making among dental interns, general dentists, fifth-year dental students, and sixth-year dental students before tooth extraction to simplify the decision-making, improve treatment outcomes, and easily prepare the instruments before tooth extraction. Additionally, to improve patient care. Since it is a very controversial topic, the results show the knowledge and the difference in decision options. The study's findings demonstrate some variation among oral and maxillofacial surgeons owing to various schools, as well as among fifth and sixth-year dental students, which is mainly attributable to a need for more fundamental understanding. For example, most of the participants chose a periapical radiograph to evaluate the tooth before extraction, which is the best radiograph to check bone density and root configuration, while others chose a panoramic radiograph to evaluate the tooth before extraction, which is a standard radiograph for any new patient to have, minority chose bitewing radiograph for tooth evaluation before extraction which considered lack of knowledge.

Another example is that in case-based questions, the majority agreed on the correct answer, considered good decision-making. Also, when we asked about the factors that led to their decision, each participant chose something different, which is good in the decision-making process. According to the knowledge questions, dental interns and general dentists could find the most common reason for tooth extraction, while fifth and sixth-year dental students needed help finding the correct answer due to a lack of knowledge. However, they will gain knowledge with years of experience, information, and learning. As a majority, they have good decision-making and thinking on their knowledge and experience; the minority were going into different things due to lack of knowledge and experience. Also, the majority agreed on the factors contributing to simple tooth extraction. One of the study's limitations is that we only focus on fifth, and sixth-year students, dental interns, and general dentists at KAU Dental Hospital. Also, we have a relatively small sample size of general dentists, which is considered biased in generalizing their knowledge and decision-making to all general dentists at KAU, as we suggest a larger sample size for future research to avoid any bias. The impact of the study is to determine the knowledge and awareness of making the decision simple versus surgical tooth extraction since it is very controversial clinical and radiographic among fifth-year and sixth-year dental students, dental interns, and general practitioners.

In conclusion, the study aimed to evaluate the awareness and decision-making processes among dental students, interns, and general practitioners regarding tooth extraction methods. It was found that while the majority demonstrated good decision-making based on their knowledge and experience, some variations existed due to differing levels of understanding, particularly among dental students. The significance of proper radiographic evaluation and a comprehensive understanding of extraction factors, such as periodontal involvement, root canal treatment, and bone density, was highlighted. Despite some discrepancies, participants agreed on factors contributing to simple tooth extraction. However, limitations such as the small sample size of general dentists and the focus on a single institution suggest the need for larger-scale studies to generalize findings. Nonetheless, the study underscores the importance of continuous education and training to enhance practitioners' competency in tooth extraction decision-making, ultimately improving patient care and treatment outcomes.

### **Acknowledgments**

The author thanks the support and help given by the dental interns, Sarah Alotaibi, Abdulbari Alotaibi and Jameel Makki (King Abdulaziz University, Faculty of Dentistry (KAUFD)).

### **References**

- Sambrook PJ, Goss AN. Contemporary exodontia [published correction appears in Aust Dent J. 2018 Jun;63(2):266]. Aust Dent J. 2018;63 Suppl 1: S11-S18. doi:10.1111/adj.12586
- Dym H, Weiss A. Exodontia: tips and techniques for better outcomes. Dent Clin North Am. 2012;56(1):245-x. doi: 10.1016/j.cden.2011.07.002
- Tolentino PHMP, Rodrigues LG, Miranda de Torres É, Franco A, Silva RF. Extractions in Patients with Periodontal Diseases and Clinical Decision-Making Process. Acta Stomatol Croat. 2019; 53(2):141-149. doi:10.15644/asc53/2/6
- Nayyar J, Clarke M, O'Sullivan M, Stassen LF. Fractured root tips during dental extractions and retained root fragments. A clinical dilemma? Br Dent J. 2015;218(5):285-290. doi: 10.1038/sj.bdj.2015.147
- Lee J, Kang S, Jung H-I, Kim S, Karabucak B, Kim E. Dentists' clinical decision-making about teeth with apical periodontitis using a variable-controlled survey model in South Korea. BMC Oral Health. 2020;20(1). doi:10.1186/s12903-020-1014-z
- Mecler N, Rodrigues RM, Silva AMP, et al. Role of professional expertise in the decision-making process for periodontally compromised teeth. Gen Dent. 2022;70(2):62-68.
- Almasri M. Assessment of extracting molars and premolars after root canal treatment: A retrospective study. Saudi Dent J. 2019;31(4):487-491. doi: 10.1016/j.sdentj.2019.04.011
- Vadane AK. "Difficult extraction of post-endodontically treated upper second molar: A case report". Biomedical Journal of Scientific & Technical Research. 2017;1(6). doi:10.26717/bjstr.2017.01.000485

Park KL. Which factors are associated with difficult surgical extraction of impacted lower third molars? *J Korean Assoc Oral Maxillofac Surg.* 2016;42(5):251-258. doi:10.5125/jkaoms.2016.42.5.251

Shareef RA, Chaturvedi S, Suleman G, Elmahdi AE, Elagib MF. Analysis of tooth extraction causes and patterns. *Open Access Macedonian Journal of Medical Sciences.* 2020;8(D):36-41. doi:10.3889/oamjms.2020.3784

Edward J, Aziz MA, Madhu Usha A, Narayanan JK. Comparing the Efficiency of Two Different Extraction Techniques in Removal of Maxillary Third Molars: A Randomized Controlled Trial [published correction appears in *J Maxillofac Oral Surg.* 2017 Dec;16(4):430]. *J Maxillofac Oral Surg.* 2017;16(4):424-429. doi:10.1007/s12663-016-0935-1

Alenazi A, Aleidan A, Alotheem M, Alqahtani R. Knowledge and Awareness of Postextraction Complications among Dental Seniors and Interns in Riyadh Province. *J Pharm Bioallied Sci.* 2021;13(Suppl 1):S602-S607. doi:10.4103/jpbs.JPBS\_721\_20

Brand HS, van der Cammen CCJ, Roorda SME, Baart JA. Tooth extraction education at dental schools across Europe. *BDJ Open.* 2015;1:15002. Published 2015 Oct 23. doi:10.1038/bdjopen.2015.2

Nasreen T, Haq ME. Factors of tooth extraction among adult patients attending in Exodontia Department of Dhaka Dental College and Hospital. *Bangladesh Journal of Orthodontics and Dentofacial Orthopedics.* 2013;2(1):7-10. doi:10.3329/bjodfo.v2i1.15996

Hong B, Bulsara Y, Gorecki P, Dietrich T. Minimally invasive vertical versus conventional tooth extraction: An interrupted time series study. *J Am Dent Assoc.* 2018;149(8):688-695. doi:10.1016/j.adaj.2018.03.022