Level of confidence in exodontia among senior dental students and interns in Madinah: a cross-sectional study

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ABSTRACT

Objective: This study aimed to assess the level of confidence regarding exodontia among senior dental students and interns in Madinah, Saudi Arabia.

Methods: A cross-sectional descriptive observational study was conducted using an online-based self-administered questionnaire consisting of 34 close-ended questions. It was divided into four sections, including demographic data, theoretical knowledge, clinical knowledge, and the level of confidence of exodontia.

Results: The study group comprised of 84 participants. Most participants were females, 53.6%, and half were dental interns. Around 88.1% reported that they had sufficient knowledge to decide if a tooth was indicated for extraction or not. Almost 77.4% thought they had sufficient knowledge to assess case difficulty, and 72.6% had sufficient knowledge about the essential investigations needed to assess the difficulty of the case. However, 33.3% were less confident about extracting an ankylosed tooth, while 50% might need help, and 35.7% were less confident about extracting a partially impacted third molar and less confident about handling medical emergencies during dental extraction.

Conclusion: The present study revealed that there is a need to enhance the level of confidence and knowledge related to exodontia among dental students and interns. Proper diagnosis of complex cases and choosing a suitable surgical procedure are essential factors in achieving the treatment outcome and could influence a good prognosis.

Keywords: Exodontia, knowledge, confidence, dental students, Saudi Arabia.

Introduction

Exodontia or tooth extraction is a complete, painless removal of a tooth or root with minimal trauma to surrounding structures, so the wound heals uneventfully with no post-operative prosthetic problems [1]. Tooth extraction is a widespread procedure that is carried out in dental clinics due to multiple factors, such as non-restorable carious teeth, compromised periodontium, dental pathologies, crowding, and pericoronitis.

For senior dental students and interns, exodontia should be considered a basic clinical skill; at this level, students are frequently tested on their level of knowledge and extraction technique to evaluate their competency and prepare them to work unsupervised after graduation. However, theoretical knowledge and clinical skills are insufficient.

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Having a high level of self-confidence, good judgment, and appropriate decision-making skills are very crucial characteristics, a competent dentist should acquire. In addition, the awareness of having skill limitations in managing some difficult clinical cases or even acknowledging that a particular case is beyond the precipitator’s ability to handle is a trait of a good dentist. Measuring the confidence level is one way of assessing the practitioner’s competency. One study suggested that the more familiar one becomes with completing a procedure, the more they are confident in it [2].

The confidence level of senior dental students and interns can be evaluated through their capability to provide a comprehensive treatment plan and proper prosecution procedures. Similar studies were published in Saudi Arabia, but none were conducted in the Medina region. A similar cross-sectional study was published in 2021; the study aimed to measure the student’s confidence level in performing 41 basic procedures in various categories such as dental emergencies, aesthetics, orthodontics, prosthodontics, and surgery [3]. Another similar study was published in 2015, conducted at AlJouf University. The study aimed to evaluate the confidence level in performing wide oral and maxillofacial surgical procedures, such as surgical extractions, surgical placement of implants, incision and drainage of dental abscesses, and taking biopsies [4]. These previously mentioned studies concluded that students’ self-confidence is low in performing dental extraction procedures. However, none of these studies shed light on the probable causes of this problem.

This study aimed to explore and evaluate the level of confidence regarding exodontia among senior dental students and interns in the Medina region and assess their case management and decision-making skills. In addition, this research would guide us to find the existing gap regarding this aspect.

Subjects and Methods

A cross-sectional descriptive observational study was conducted between 30 September, 2022 and 30 April, 2023 among dental students and interns during their clinical years at Taibah University, College of Dentistry, Madina, Saudi Arabia. Dental students and interns of both genders were eligible for participation. The sampling technique for this study was a convenient sampling technique. Dental seniors and interns were the target groups for this study. On the other hand, preclinical students, dental consultants, and students from other universities were excluded.

This study used an online self-administered questionnaire in the English language. The questionnaire was distributed to the participants as a Google Form via different media platforms. The questionnaire begins with participation approval, and then it has 34 questions divided into four main sections. Section 1 is concerned with the participant’s demographic data, including their gender and level of education (dental sixth-year students and dental interns only). Section 2 mainly covers the theoretical knowledge of exodontia and contains eight questions about sufficient knowledge, head and neck anatomy, appropriate anesthesia, tooth innervation, dealing with medically compromised patients, medical emergencies, case selection, and the knowledge to select instruments. Section 3 consists of 10 questions about clinical exodontia knowledge. The last section consists of 14 questions to assess the level of confidence. All of them are in the form of a Likert scale, and finally, open-ended questions. The participants submitted their answers anonymously and were coded during the data analysis. Participation in this study was voluntary; all participants’ information is confidential and not obtained in the questionnaire.

The data from the Google form were entered into the Statistical Package for Social Science 16 (version 16, Inc, Chicago, IL) for analysis. The sample characteristics were reported using descriptive analysis. Descriptive statistics were used, and the frequencies and percentages were calculated.

Results

Out of a total of 84, more than half of the participants were females (53.6%). Half of the participants were interns, while the other half were in their final year of undergraduate studies in dental school (Table 1).

As expected, most participants (88.1%) reported that they have sufficient knowledge to decide if a tooth is indicated for extraction or not. Around 79.8% of participants agreed that they had sufficient knowledge to choose the appropriate anesthesia for each patient. Furthermore, 94% of participants agreed that they have sufficient knowledge about the nerves that supply the teeth and their surrounding structures, while 77.4% of participants agreed that they have sufficient knowledge about the considerations before starting dental extraction for medically comprised patients. Most of them reported that they have sufficient knowledge about the medical emergencies that might occur during dental extraction, such as syncope, hypoglycemia, and seizures. However, 77.4% thought they had sufficient knowledge to assess case difficulty, and 72.6% had sufficient knowledge

Table 1. Demographic variables of the participants (n = 84).

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>39 (46.4)</td>
</tr>
<tr>
<td>Female</td>
<td>45 (53.6)</td>
</tr>
<tr>
<td>What is your education level? (Academic year)</td>
<td></td>
</tr>
<tr>
<td>Dental intern</td>
<td>42 (50)</td>
</tr>
<tr>
<td>Last year dental student</td>
<td>42 (50)</td>
</tr>
</tbody>
</table>
Level of confidence in exodontia

Table 2. Distribution of responses according to theoretical knowledge assessment (n = 84).

<table>
<thead>
<tr>
<th>Theoretical knowledge assessment</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>I am not sure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have sufficient knowledge to decide if a tooth is indicated for extraction or not</td>
<td>74 (88.1)</td>
<td>0 (0)</td>
<td>10 (11.9)</td>
</tr>
<tr>
<td>I have sufficient knowledge to choose the appropriate anesthesia for each patient</td>
<td>67 (79.8)</td>
<td>3 (3.6)</td>
<td>14 (16.7)</td>
</tr>
<tr>
<td>I have sufficient knowledge about the nerves that supply the teeth and its surrounding structures</td>
<td>79 (94)</td>
<td>0 (0)</td>
<td>5 (6)</td>
</tr>
<tr>
<td>I have sufficient knowledge about the considerations before starting dental extraction to medically comprised</td>
<td>65 (77.4)</td>
<td>5 (6)</td>
<td>14 (16.7)</td>
</tr>
<tr>
<td>I have sufficient knowledge about the medical emergencies that might occur during dental extraction (syncpe, hypoglycemia, seizures, and so on)</td>
<td>69 (82.1)</td>
<td>5 (6)</td>
<td>10 (11.9)</td>
</tr>
<tr>
<td>I have sufficient knowledge to assess case difficulty</td>
<td>65 (77.4)</td>
<td>2 (2.4)</td>
<td>17 (20.2)</td>
</tr>
<tr>
<td>I have sufficient knowledge about the essential investigations needed to assess the difficulty of the case</td>
<td>61 (72.6)</td>
<td>4 (4.8)</td>
<td>19 (22.6)</td>
</tr>
<tr>
<td>I have sufficient knowledge of suturing techniques</td>
<td>59 (70.2)</td>
<td>17 (20.2)</td>
<td>8 (9.5)</td>
</tr>
</tbody>
</table>

Table 3. Distribution of responses according to clinical knowledge assessment (n = 84).

<table>
<thead>
<tr>
<th>Clinical knowledge assessment</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is taking a radiograph essential before extracting any tooth</td>
<td></td>
</tr>
<tr>
<td>It is only necessary for the remaining roots</td>
<td>8 (9.5)</td>
</tr>
<tr>
<td>It is not necessary in the case of a simple mobile tooth</td>
<td>3 (3.6)</td>
</tr>
<tr>
<td>It depends on the practitioner’s judgment</td>
<td>12 (14.3)</td>
</tr>
<tr>
<td>It is necessary for all cases</td>
<td>61 (72.6)</td>
</tr>
<tr>
<td>Maximum number of cartridges given to a patient depends on the</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>81 (96.4)</td>
</tr>
<tr>
<td>Age</td>
<td>38 (45.2)</td>
</tr>
<tr>
<td>Height</td>
<td>8 (9.5)</td>
</tr>
<tr>
<td>Gender</td>
<td>11 (13.1)</td>
</tr>
<tr>
<td>Medical condition</td>
<td>66 (78.6)</td>
</tr>
<tr>
<td>The forceps shown in this image are used to remove</td>
<td></td>
</tr>
<tr>
<td>Upper teeth</td>
<td>3 (3.6)</td>
</tr>
<tr>
<td>Lower teeth</td>
<td>81 (96.4)</td>
</tr>
<tr>
<td>When extracting a tooth using a forceps, the first force applied is</td>
<td></td>
</tr>
<tr>
<td>Apical force</td>
<td>72 (85.7)</td>
</tr>
<tr>
<td>Buccal force</td>
<td>8 (9.5)</td>
</tr>
<tr>
<td>Lingual force</td>
<td>2 (2.4)</td>
</tr>
<tr>
<td>Tractional force</td>
<td>2 (2.4)</td>
</tr>
<tr>
<td>Single conical root can be easily removed from the socket using which type of force</td>
<td></td>
</tr>
<tr>
<td>Apical force</td>
<td>3 (3.6)</td>
</tr>
<tr>
<td>Lingual force</td>
<td>1 (1.2)</td>
</tr>
<tr>
<td>Rotational force</td>
<td>80 (95.2)</td>
</tr>
</tbody>
</table>

about the essential investigations needed to assess the difficulty of the case (Table 2).

Around 72.6% used to take a radiograph as an essential procedure before exodontia. Most of the participants stated that the maximum number of anesthesia that can be given to patients depends on weight (96.4%), age (45.2%), and medical condition (78.6%). Furthermore, 85.7% correctly answered that apical force should be applied first when extracting a tooth using a forceps, and 95.2% chose rotational force to extract a single conical root easily (Table 3).

Most participants were highly confident in giving profound local anesthesia, performing simple extraction, and extracting remaining roots 90.5%, 94%, and 78.6%, respectively. However, 33.3% were less confident in extracting ankylosed teeth, while 35.7% were less confident in extracting a partially impacted third molar and less confident in handling medical emergencies.
Level of confidence in exodontia

Table 4. Distribution of responses according to confidence level assessment (n = 84).

<table>
<thead>
<tr>
<th>Confidence level assessment</th>
<th>Less confident</th>
<th>Highly confident</th>
<th>With help of the supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident enough to give profound local anesthesia</td>
<td>3 (3.6%)</td>
<td>79 (94%)</td>
<td>2 (2.4%)</td>
</tr>
<tr>
<td>I am confident enough to perform simple extraction</td>
<td>3 (3.6%)</td>
<td>79 (94%)</td>
<td>2 (2.4%)</td>
</tr>
<tr>
<td>I am confident enough to extract remaining roots</td>
<td>7 (8.3%)</td>
<td>66 (78.6%)</td>
<td>11 (13.1%)</td>
</tr>
<tr>
<td>I am confident enough to manage fractured crowns or roots during the extraction procedure</td>
<td>25 (29.8%)</td>
<td>21 (25%)</td>
<td>38 (45.2%)</td>
</tr>
<tr>
<td>I am confident enough to extract ankylosed tooth</td>
<td>28 (33.3%)</td>
<td>14 (16.7%)</td>
<td>42 (50%)</td>
</tr>
<tr>
<td>I am confident enough to extract a partially impacted third molar</td>
<td>30 (35.7%)</td>
<td>20 (23.8%)</td>
<td>34 (40.5%)</td>
</tr>
<tr>
<td>I am confident and have the ability to handle medical emergencies during dental extraction</td>
<td>33 (39.3%)</td>
<td>29 (34.5%)</td>
<td>22 (26.2%)</td>
</tr>
<tr>
<td>I am confident enough to do sutures following a surgical extraction</td>
<td>18 (21.4%)</td>
<td>49 (58.3%)</td>
<td>17 (20.2%)</td>
</tr>
</tbody>
</table>

Discussion

Exodontia is a common procedure in dental clinics. Dental seniors and interns should acquire the necessary knowledge and proper clinical skills to perform the extraction procedure with minimal complications. The level of confidence varies depending on the presence of the supervisor during the procedure. Therefore, this study aimed to evaluate the level of confidence in exodontia among dental seniors and interns in the Medina region. In addition, it points out the contributing factors that might affect self-confidence.

Monitoring students during clinical sessions is considered one of the key components of the educational process that is used to enhance the quality of clinical teaching [5]. Previous studies reported an apparent lack of confidence in undertaking surgical exodontia among dental students during their clinical years, including poor self-perceived knowledge and low level of confidence [6].

Evidence showed that undergraduates usually thought that they were competent to perform a variety of routine clinical tasks that are considered simpler procedures and/or procedures in which they had the most clinical experience [7]. Of note, the lowest scores of confidence were related to more complex procedures and procedures in which they had the least clinical experience. Theoretical and clinical knowledge regarding exodontia is essential to perform safety practices and achieving treatment outcomes [8].

Present results highlighted a relatively high level of theoretical knowledge among participants while less level of confidence, especially when managing complex cases and/or medically compromised patients. There is no doubt that essential knowledge regarding the management of medically compromised cases has been taught during the dental school curriculum. Although previous studies suggested that increased clinical time in complex procedures might help increase final-year students’ confidence [7].

Assessing the difficulty of the cases and would be reflected in the treatment plan, therapeutic procedures, and prognosis. For example, recent evidence revealed that prophylactic antibiotics might reduce the risk of infection, dry socket, and pain following exodontia and increase mild and transient adverse effects [10]. In addition, patients at a higher risk of infection are more likely to benefit from prophylactic antibiotics, as infections in this group of patients are common and might be associated with complications and, therefore, are more difficult to treat [10].

Variety of surgical interventions used for management of complex cases and/or possible complications. Incidence of medication-related osteonecrosis of the jaw (MRONJ) in individuals taking intravenous bisphosphonates for advanced cancer and/or other illnesses is widely reported in the literature, and antibiotic prophylaxis suggested to provide some benefits; however, preventive treatments thought to be more effective than standard care for reducing the incidence of MRONJ [11]. Hence, medically compromised patients, in particular, need a conservative approach to management with their treating medical specialists. Furthermore, adjunctive procedures might be suggested to further improve the treatment outcomes, such as alveolar ridge preservation strategies that are indicated to minimize the loss of ridge volume that typically follows tooth extraction [12,13]. In addition, employing different surgical techniques for tooth extraction, especially wisdom teeth, along with placing protein-rich plasma in sockets might reduce the incidence of dry sockets, swelling, and trismus [14].

Truly, all previously mentioned techniques might require...
a high level of knowledge and refined surgical techniques
to achieve optimal results.

Different academic teaching strategies have been used
to provide undergraduate students with the required
theoretical knowledge and clinical skills during their
years of study [15]. Measuring related learning outcomes
is of paramount importance to improve the quality of
teaching delivered in the dental school and to aid in
preparation for their entry into the dentistry practice.

One explanation for why most students score relatively
low in confidence in dealing with medical emergencies
during dental extraction, performing extraction of
complex cases such as ankylosed or partially impacted
third molars, is that they are considered the most invasive
procedure that students are exposed to during their
clinical years and often not allowed to operate such cases
so they might end up with less clinical exposure and even
if they are clinically competent as dentists, they might
feel not competent to conduct such surgical procedures.

When assessing theoretical knowledge, the responses
from the participants indicate that their undergraduate
teaching was sufficient to prepare them for related clinical
scenarios [16,17]. However, there is always a tendency to
underestimate the acquired clinical skills until you have
the chance to apply this clinical knowledge in clinical
practice.

The results of the present study showed that it is crucial
to ensure that students have sufficient opportunity to
undertake the required knowledge and clinical skills
to perform exodontia safely. The lack of confidence in
different aspects of the management of complex cases
is an example that further efforts would be warranted
for enhanced student learning outcomes. Therefore, it is
paramount that dental students must be equipped with the
knowledge and skills to provide appropriate management
for their future patients.

The limitation of this study could be attributed to the
fact that dental students have different performance and
academic caliber, thus disclosing a wide variation in the
level of education, which was not adequately assessed by
the current study methodology. Furthermore, the sample
size of the current study was relatively small, which
might impact the generalizability of the present results.

Despite these limitations, this study provides valuable
information on the level of confidence and knowledge of
senior dental students and interns to perform exodontia,
and it allows a rational understanding of the educational
and training needs. Given the present results, there is
perhaps sufficient evidence for the need to provide more
education and training for dental students regarding
surgical and non-surgical exodontia.

Conclusion
The present study revealed the necessity to increase
the knowledge and confidence about exodontia and
acquire the necessary skills among dental students and
interns. A collaboration between dental schools by
sharing knowledge and enhancing the undergraduate
curricula regarding oral surgery teaching and its related
aspects might help establish higher standards required
in exodontia among dental students and interns to be
independent practitioners and to address the gap of
knowledge to be covered during the foundation training
years.

List of Abbreviations
MRONJ Medication-related osteonecrosis of the jaw

Conflict of interest
The authors declare that there is no conflict of interest
regarding the publication of this article.

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Consent to participate
Written informed consent was obtained from all the
participants.

Ethical approval
The study protocol was approved by the Ministry of
Education Taibah University College of Dentistry Research

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