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Knowledge, Attitude and Practice Regarding the Management of Bleeding after Tooth Extraction Among Dental Students, Interns and Dentists in Saudi Arabia

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Abstract **Introduction:** Uncontrolled bleeding increases the risk of morbidity and consequences during dental surgery; thus, it's critical to be prepared to handle and treat these situations should they arise. During tooth extraction surgery, bleeding is a frequent symptom and can be caused by a few conditions, including hepatitis, hemophilia, high blood pressure and other illnesses. Several treatment plans, including pressure packs, sutures, antifibrinolytic medicines, plasma-rich platelets, fibrin sealant dressings and powder clots, have been employed to control complications following surgery. **Objectives:** To evaluate dental students, interns and practitioners in Saudi Arabia about their knowledge, attitudes and practices regarding managing bleeding after tooth extraction **Methodology:** This is a cross-sectional study conducted between July 2024 to February 2025. Our questionnaire was developed after rigorous Author TAA did the Conceptualization, searched for articles of a similar kind. A total of 22 statements were used. All data were loaded into an Excel sheet and statistical analysis was performed using SPSS version 20. A chi-square test was conducted. A significance threshold of $p<0.05$ was applied. **Results**: In a study evaluating the knowledge, attitudes and practices regarding the management of bleeding post-tooth extraction among dental students, interns and dentists in Saudi Arabia, 394 participants were surveyed. The mean age was 24.7 years, predominantly female (50.3%) and mainly from the Southern Region (49.0%). While 64.21% rated their knowledge of dental awareness for bleeding disorders as high, only 41.9% felt confident in their understanding of bleeding management. Notably, 45.9% demonstrated a strong grasp of appropriate strategies, yet 23.1% had low knowledge levels, underscoring the need for enhanced educational initiatives. Statistically significant correlations were found between knowledge and factors including gender, region, academic year and GPA. **Conclusion:** While our study indicates a solid foundational understanding of bleeding management among dental students, interns and practitioners in Saudi Arabia, it also highlights significant gaps that necessitate targeted educational interventions.

Key Words Knowledge, Awareness, Bleeding, Clinical control

INTRODUCTION

Exodontia is the process of using surgical equipment to remove a tooth from the alveolar socket and any supporting structures [1]. During tooth extraction surgery, bleeding is a frequent symptom and can be caused by several conditions, including hepatitis, hemophilia, high blood pressure and other illnesses [2]. Before beginning extractions, a full history is crucial so that the appropriate safety measures may be taken beforehand [3]. Inherited bleeding disorders such as hemophilia or von Willebrand disease (VWD) are characterized by spontaneous bleeding, impaired hemostasis and a high risk of intra- or postoperative bleeding [4].

Medication such as anticoagulants and antiplatelets increases the risk of bleeding after surgery [5]. After extraction, bleeding could occur due to complications and if

it is not treated effectively quickly, it could not only cause intolerable pain in patients but also cause shock and other adverse reactions [6]. Several treatment plans, including pressure packs, sutures, antifibrinolytic medicines, plasma-rich platelets, fibrin sealant dressings and powder clots, have been employed to control complications following surgery [7].

Studies have been published on the knowledge, importance and management of uncontrolled bleeding in dental surgical procedures among dental professionals. This research included 166 people aged 21 and above. 92.8% of participants were aware of some of the medical problems related to uncontrollable bleeding during dental surgical procedures, whereas the remainder were uninformed or unsure. 92.2% of participants agreed that medical history is crucial in dental surgical operations, while the remainder disagreed [8]. According to the survey, 93.4% of students routinely perform extractions in their practices. Among those, 32.5% have faced issues and just 20% are confident in dealing with them. The remaining 64.8% of students who have not had issues are not confident in managing them in Prasad *et al.* [9]. In 2020. The study revealed that 33.33% of interns and final-year students but only 4% of third-year students, were familiar with hemostatic medications.30% of interns, 28% of final-year interns and 16.67% of third year were familiar with prophylactic FFP transfusions. This demonstrates that interns are more knowledgeable on how to deal with bleeding problems [10].

In this study, our objective is to determine the knowledge, attitude and practice regarding the management of bleeding post-extraction among dental students, interns and dentists in Saudi Arabia.

Objectives

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METHODOLOGY

Study Design and Setting

This is a cross-sectional study followed STROBE guidelines, conducted in Saudi Arabia between July 2024 to February 2025. The study's participants were dental students, interns and dentists, both male and female, in the Kingdom of Saudi Arabia.

Sample Size

Using an estimated sample size of 384 and a suitable error of 5%, the 95% Confidence Level. Standard deviation (= 1.96) was taken into consideration, getting the following Q: (1-0.50) = 50%.

Therefore, the expected minimum sample size required for the research is n = (1.96)^2X 0.50X0.50/(0.50)^2 = 384 persons.

Inclusion and Exclusion Criteria

For inclusion criteria were as follows: Dental students, interns and dentists who live in Saudi Arabia and agree to participate in this study. Exclusion criteria are any non-dental practitioners.

Method for Data Collection, Instrument and Score System

First of data collection was done in the form of the participants' responses to the questions. The questionnaire included demographic features such age, gender, specialty, Region and visit reasons (such as emergency or referral or checkup) Second is Awareness of bleeding disorders and their management participants were asked about them. Did the patient encounter any bleeding No disorder patient before if yes, how did you manage this Perform the procedure without the case physician consent, causes of hemophilia A and about the Von Willebrand disease classified Management of Von Willebrand disease patients is similar to patients with Hemophilia A in your opinion, what is the best measure to stop bleeding [11]. Also, they were asked about the safest analgesic for patients with Bleeding disorders [11]. The last part is an Assessment of knowledge about bleeding disorders and their management with Standard Therapeutic Target Range (STTR) for patients taking warfarin and aspirin and about the minimal duration for Aspirin and warfarin termination before the dental procedure [12]. Our questionnaire was developed after rigorous Author TAA did the Conceptualization and searched for articles of a similar kind.

Scoring System

In all, 22 statements served to assess the participants' attitudes and degree of knowledge. 6 statements for demographics, 16 for knowledge, one point was given for correct answers and zero points were given for incorrect answers. The original Bloom's cut-off points, were 80.0%-100.0%, 60.0%-79% and 59.0%, The participants were divided into the knowledge score varied from 0 to 19 points and were classified into three levels as follows: those with a score of 11 or below (≤11) were classified as having a low level of knowledge, those with scores between 12 and 14 as having a moderate level of knowledge and those with scores 15 or above (≥15) as a high level of knowledge.

Pilot Test

The questionnaire was distributed to 20 individuals and asked to fill it out. This was done in an attempt to assess the study's viability and the simplicity of use of the questionnaire. The pilot study's results were excluded from the study's final review.

Analysis and Entry Method

After being gathered, the data were loaded into an Excel sheet and statistical analysis was performed using SPSS version 20. A chi-square test was conducted. A significance threshold of $p<0.05$ was applied.

RESULTS

Table 1 displays various demographic parameters of the participants with a total number of (394). The mean age of

Table 1: Sociodemographic characteristics of participants (n = 394)

Parameter		No.	Percent (%)
Age (Mean:24.7, STD:3.6)	22 or less	87	22.1
	23 to 24	146	37.1
	25 to 26	87	22.1
	27 or more	74	18.8
Gender	Female	198	50.3
	Male	196	49.7
Residential region	Northern Region	26	6.6
	Southern Region	193	49.0
	Center Region	82	20.8
	Eastern Region	39	9.9
	Western Region	54	13.7
Nationality	Non-Saudi	11	2.8
	Saudi	383	97.2
Academic level	First-year	10	2.5
	Second year	6	1.5
	Third year	21	5.3
	Fourth-year	24	6.1
	Fifth year	41	10.4
	Sixth year	125	31.7
	Dentist	87	22.1
	Intern	80	20.3
GPA (grade point average)	A working dentist	87	22.1
	Excellent (No Less Than 3.50 Out Of 4.00) Or (No Less Than 4.50 Out Of 5.00)	151	38.3
	Very Good (From 2.75 To 3.49 Out Of 4.00) Or (From 3.75 To 4.49 Out Of 5.00)	121	30.7
	Good (From 1.75 To 2.74 Out Of 4.00) Or (From 2.75 To 3.74 Out Of 5.00)	30	7.6
	Satisfactory (From 1.00 To 1.74 Out Of 4.00) Or (From 2.00 To 2.74 Out Of 5.00)	5	1.3

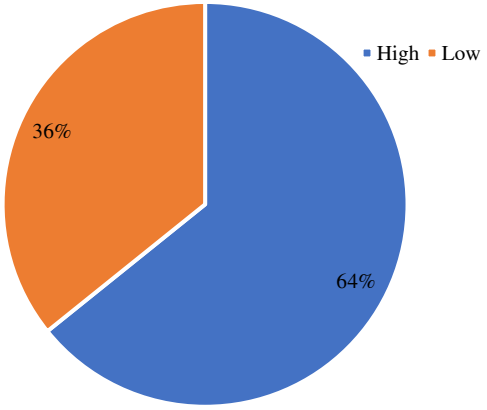

Figure 1: Illustrates knowledge about the benefits of dental awareness of bleeding disorders across Saudi Arabia

the cohort is 24.7 years, standard deviation of 3.6, implying that the sample is relatively young with the aging of 49% of the sample in the range of 23 to 24 years, i.e., 37.3%. It is almost in favor of the gender; females increased by 50.3% and males rose by 49.7%. Participants come from throughout the country, most geographically from the Southern Region (49.0%) but with a minority distribution to the Northern (6.6%) and Eastern (9.9%) Regions. The overwhelmingly majority (97.2%) are Saudi nationals, thus, a highly localized demographic. Overall, as per the academic levels, participants in their sixth year of study (31.7%) are found to be in a relatively higher proportion and participants are also classified into the majority performance category with excellent GPA (38.3%).

As shown in Figure 1, Out of 394 respondents 64.21%, 253 of them rated the knowledge they have about the benefits of dental awareness for bleeding disorders in Saudi Arabia as high. In contrast, 35.79% (141 people) rated their knowledge to be low.

Table 2 shows the data in a complete overview of what know, what attitude and what the practices done by dental students, interns and practicing dentists in Saudi Arabia consist of a sample size of 394 persons. Almost half (57.1%) of the respondents stated that they have come across patients with bleeding disorders, thus reflecting a good deal of exposure to this essential aspect of dental practice. The large majority (83.8%) knew safe analgesics for patients with such disorders and a very large proportion (84.0%) recognized direct pressure to be the primary method of managing prolonged bleeding, indicating a good basic understanding of hemostatic techniques. In addition, 80.7 percent of respondents admitted that diurnal blood pressure variation affects control of bleeding, illustrating an awareness of the patient's physiology. While, however, 41.9% deemed their knowledge of bleeding disorders to be good, a startling 89.8% expressed that they wanted to further educate themselves through lectures and workshops.

As shown in Figure 2, The data further reveals that 75.89% (299 individuals) strongly agreed medical history has a significant role to play in dental surgical procedures. Furthermore, 19.80% (78 people) agree with this statement, making a total agreement of 95.69%. However, 4.31% (17) are still neutral (5.79%) while 2.03% (8) support right-wing populist 5.79%) and 2.27% (9) supported populist left (5.79%).

Table 2: Parameters related to knowledge, attitude, and practice regarding management of bleeding after tooth extraction among Dental students, interns and dentists in Saudi Arabia (n = 394)

Parameter		No.	Percent (%)
Did you have a bleeding disorder patient before?	No	169	42.9
	Yes	225	57.1
Did you know what a safe analgesic is for patients with bleeding disorders?	No	64	16.2
	Yes	330	83.8
How do you manage prolonged bleeding primarily? *	Applying hemostatic agents	227	57.6
	Crushing the foramen socket with a hemostat	79	20.1
	Direct pressure over the socket	331	84.0
	Suturing	263	66.8
Do you think Diurnal variation of blood pressure is also one of the causes of uncontrolled bleeding post-extraction?	No	76	19.3
	Yes	318	80.7
Did you know about one or more of the management of bleeding?	No	45	11.4
	Yes	349	88.6
How would you rate your knowledge about the benefits of dental awareness about bleeding disorders across Saudi Arabia?	High	253	64.2
	Low	141	35.8
Are you aware of anticoagulant medications?	No	56	14.2
	Yes	338	85.8
Do you know about vitamin K deficiency?	No	61	15.5
	Yes	333	84.5
Do you know the normal value for the bleeding time test?	No	84	21.3
	Yes	310	78.7
If bleeding continuously after 2- days post-extraction, is it a danger sign?	No	50	12.7
	Yes	344	87.3
Do you know the causes of hemophilia A?	No	75	19.0
	Yes	319	81.0
Do you know the classification of von Willebrand disease?	No	122	31.0
	Yes	272	69.0
How do you grade yourself regarding knowledge of bleeding disorders?	Good	165	41.9
	Average	202	51.3
	Poor	27	6.9
Do you think that you need to learn more about bleeding disorders (Lectures-workshops)?	No	40	10.2
	Yes	354	89.8
Are you aware of some medical conditions associated with uncontrolled bleeding in dental surgical procedures?	No	33	8.4
	Yes	361	91.6
Do you think medical history plays an important role in dental surgical procedures?	Strongly Agree	299	75.9
	Agree	78	19.8
	Neutral	17	4.3

*Results may overlap

Table 3: Shows knowledge regarding the management of bleeding after tooth extraction score results

	Frequency	Percent
High level of knowledge	181	45.9
Moderate knowledge	122	31.0
Low knowledge level	91	23.1
Total	394	100.0

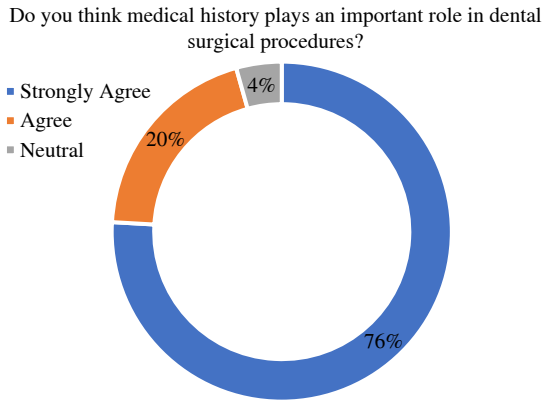

Figure 2: Illustrates whether importance of medical history in dental surgical procedures among participants

Table 3 presents the data regarding knowledge of bleeding post-tooth extraction management, offers useful insight into the knowledge and preparedness with which individuals in this important area of dental care can understand and go prepared about this critical one. Interestingly, 45.9% of respondents showed a high level of knowledge of appropriate bleeding management strategies, denoting a level of understanding of the appropriate methodology. However, while 31.0% exhibited moderate knowledge, suggesting there is room for improvement through targeted educational interventions. Nevertheless, this ought to be taken as seriously as the fact that 23.1% of participants had low knowledge.

Table 4 shows that knowledge regarding the management of bleeding after tooth extraction has a

Table 4: Relation between knowledge regarding management of bleeding after tooth extraction and sociodemographic characteristics

Parameters		Knowledge level		Total (N = 394)	p-value*
		High level of knowledge	Moderate or low knowledge		
Gender	Female	80	118	198	0.027
		44.2%	55.4%	50.3%	
	Male	101	95	196	
		55.8%	44.6%	49.7%	
Age	22 or less	38	49	87	0.138
		21.0%	23.0%	22.1%	
	23 to 24	71	75	146	
		39.2%	35.2%	37.1%	
	25 to 26	32	55	87	
		17.7%	25.8%	22.1%	
	27 or more	40	34	74	
		22.1%	16.0%	18.8%	
Residential region	Northern Region	12	14	26	0.0001
		6.6%	6.6%	6.6%	
	Southern Region	67	126	193	
		37.0%	59.2%	49.0%	
	Center Region	47	35	82	
		26.0%	16.4%	20.8%	
	Eastern Region	28	11	39	
		15.5%	5.2%	9.9%	
	Western Region	27	27	54	
		14.9%	12.7%	13.7%	
Nationality	Non-Saudi	8	3	11	0.071
		4.4%	1.4%	2.8%	
	Saudi	173	210	383	
		95.6%	98.6%	97.2%	
Academic level	First year	0	10	10	0.011
		0.0%	4.7%	2.5%	
	Second year	1	5	6	
		0.6%	2.3%	1.5%	
	Third year	6	15	21	
		3.3%	7.0%	5.3%	
	Fourth year	10	14	24	
		5.5%	6.6%	6.1%	
	Fifth year	17	24	41	
		9.4%	11.3%	10.4%	
	Sixth year	64	61	125	
		35.4%	28.6%	31.7%	
	Dentist	48	39	87	
		26.5%	18.3%	22.1%	
	Intern	35	45	80	
		19.3%	21.1%	20.3%	
Grade point average (GPA)	A working dentist	48	39	87	0.014
		26.5%	18.3%	22.1%	
	Excellent	70	81	151	
		38.7%	38.0%	38.3%	
	Good	6	24	30	
		3.3%	11.3%	7.6%	
	Satisfactory	1	4	5	
		0.6%	1.9%	1.3%	
	Very Good	56	65	121	
		30.9%	30.5%	30.7%	

*p-value was considered significant if ≤0.05

statistically significant relation to gender (p-value = 0.027), residential region (p-value = 0.0001), academic level (p- value = 0.011) and GPA (p-value = 0.014). It also shows a statistically insignificant relation to age and nationality.

DISCUSSION

The present study aimed to evaluate the knowledge, attitudes and practices of dental students, interns and practitioners in Saudi Arabia concerning the management of bleeding following tooth extraction. This is a very important topic as uncontrolled bleeding can cause significant morbidity and complications during dental procedures. Our findings show that dental professionals had a mixed level of awareness and preparedness in this area, in line with previous research in this area. A large share of our participants, 64.21%, rated their knowledge of bleeding disorders as high, an encouraging sign for their foundational knowledge. Despite this, the fact that 35.79% reported low levels of knowledge

levels dampens a little, as there is still a huge gap to be filled here. These findings are consistent with those of Eltohami, who found that most dentists knew the correct protocols for local measures to control postoperative bleeding but a large number lacked full knowledge on how to manage patients on anticoagulant therapy, such as warfarin [13]. Additionally, our work found that only 41.9% of participants reported that they had good knowledge, similar to what Alsheef *et al.* [14] noted in the education needs of dental professionals managing patients on antithrombotic medications.

Significantly encouraging was exposure of our participants to patients with bleeding disorders; a staggering 57.1 percent of them should have engaged one. It is very important, for practical use and enhances theoretical. In a manner parallel to this, Kalsi *et al.* [15] emphasized the significance of practical fields in the management of patients with inherited bleeding disorders and believed that continued affiliation with such cases could improve dentists' fidelity and competency in managing bleeding complications. Additionally, our results show that 83.8% of respondents recognised safe analgesics for patients with bleeding disorders, which agrees with Pereira *et al.* [16], who state that understanding analgesic options within anticoagulation therapy is crucial.

Despite these strengths, however, our study revealed that only 45.9% of participants had a high level of knowledge concerning appropriate management strategies for bleeding post-extraction. This is an important finding, given that in a body of research by Eltohami *et al.* [13], 98.2 percent of the doctors they studied followed the right approaches towards local hemostatic measures. This disparity implies knowledge gaps between theory and practice that must be addressed with targeted educational interventions that bridge the gap that we found in our cohort.

Our study showed a significant association between bleeding knowledge and demographic factors (gender, residential region, academic level and GPA) by statistical analysis. The finding is by the work of Golkari *et al.* [17], which revealed that demographic factors significantly affected dentists' willingness to provide treatment to patients with selected generic diseases, including those with bleeding disorders. These associations point to its implications and it probably should be tailored educational programs specific to ethnic groupsto reach the dental practitioners' competence in the professional aspect of managing bleeding complications. Our participants strongly endorsed the importance of a comprehensive medical history in dental surgical procedures and 75.89% suggested that it was critical. This is consistent with recommendations in the literature that rigorous patient assessment is required to reduce the risk of bleeding disorders [18]. Yet the finding that a considerable portion of our participants were moderate (31.0%) or low (23.1%) in knowledge of bleeding management represents an important opportunity for improvement. The study by Dagher *et al.* [19] echoes that many dental practitioners have inadequate knowledge about infection control measures, similarto management of bleeding complications.

Our study results also emphasize the importance of continuous education and training in the provision of safe bleeding disorder care in dental practice. Ninety-nine-point eight percent (89.8%) of participants expressed their desire to acquire further education via lectures and workshops, which shows readiness for attending more lectures and workshops. This also fits with the propensity that Ahmad and Al-Harbi [20] determined, emphasizing that dental professionals need to continue to receive ongoing education to update their knowledge about ways to manage different dental conditions.

However, our study has several limitations in terms of our cross-sectional study design, hence limits us from making inferences about causal relationships from the data. Furthermore, a reliance on self-reported measures might also have introduced bias because participants might have overrated their knowledge and the practices they were undertaking. Additionally, the homogeneity of the sample on the demographic scale (mainly Saudi nationals) may limit the generalizability of the findings to larger populations. Our future research should be longitudinal and use a more diverse sample to validate and extend our results.

CONCLUSIONS

According to our study, dental students, interns and dentists in Saudi Arabia have a good, sound understanding of bleeding management fundamentals but they also suffer from large gaps in their knowledge that require further training. Incorporation of comprehensive training programs for bleeding disorders and their management may further improve the ability of dental professionals to be prepared for patients with bleeding disorders, thereby improving patient care and outcomes. The contribution of the findings in this study to the growing body of literature on the need for continuous professional development comes from the fact that they provide illustrated into the management of complex medical conditions.

Acknowledgement

We acknowledge all of the volunteers who provided samples for this research.

Conflicts of Interest

The authors declare no conflict of interest.

Ethical Approval

After fully explaining the study and emphasizing that participation is optional, each participant gave their informed consent. The information gathered was safely stored and utilized exclusively for study.

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