

Original article

Assessment of Knowledge, Practice, and Confidence in Managing Medical Emergencies among Dentists in Libya: A Cross-Sectional Study

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Abstract

Medical emergencies that may occur in a dental office are challenges for dentists that require proper knowledge and practical confidence to provide suitable management to save patients' lives. Although this is a critical point, several studies reveal a gap in the level of knowledge and confidence among dentists in dealing with medical emergencies. This study aims to assess the knowledge, practice, and confidence of dentists in Libya in identifying urgent clinical situations in dental offices and determine the differences in the levels of understanding and other related factors such as demographic differences and years of experience, etc. An anonymous online/paper questionnaire was distributed among Libyan dentists from different Libyan cities to evaluate dentists' knowledge, practice, and confidence in managing medical crises that may be encountered in dental practice. The Questionnaire involves three sections: structured questions, a demographic section, a scenario-based single best answer assessing knowledge of medical emergencies, and a Likert-scale questionnaire evaluating levels of confidence. A total of 92 questionnaires were received, representing a response rate of 96%. The largest proportion of participants was aged 36-45 years (50%), and females represented 64% of the sample. A total of 47.7% of participants had clinical experience of more than 10 years. The highest correct response was for the meaning of tachycardia (95.4%), while the lowest response rate was observed for the compression-to-ventilation ratio for adult CPR (60.5%). Although the most common medical emergency that may be encountered even in daily practice is syncope, this condition received only 63.2% correct responses. However, other responses revealed a moderate level of identifying the early signs and symptoms of some medical emergency situations. 37.9% of participants attended a first aid and life support training course. Regarding the availability of an emergency kit, 46.2% of participants reported "Yes" and 42.9% answered "No", while the rest were unaware of its availability. In addition, the findings of overall clinical confidence in managing different medical emergency cases revealed notable variability in preparedness between participants. Despite dentists showing sufficient theoretical awareness of diagnosis and identifying early signs and symptoms of medical emergencies, significant insufficiency appeared in clinical confidence and the management of high-risk scenarios. Enhancing training programs among dentists is required; additionally, emphasising the presence of an emergency kit in the dental clinic is necessary to improve self-confidence and safeguard patients' lives, which is our responsibility as dentists.

Keywords. Medical Emergency, Knowledge, Attitude, Confidence.

Introduction

An urgent health crisis in a dental office is considered a critical clinical issue that may happen suddenly during dental therapy [1]. It may range from minor conditions such as syncope and hypoglycemia to more serious conditions such as anaphylactic reaction and heart attack, which are life-threatening situations [2]. However, these conditions represent a challenge for dentists as they require a rapid response to identify the first signs and symptoms and take immediate, suitable intervention to ensure patients' safety [3]. Therefore, dentists must have the knowledge and practical health preparedness to deal with any encountered medical emergencies with high competence and efficiency [4]. Practitioners have to improve their self-confidence by joining various basic life support training programs to handle situations in the dental clinic [5,6]. Although acute medical events occasionally occur in a dental office, their impacts are sometimes life-threatening and need to prompt intervention and correct handling [7].

Studies reveal that most dental practitioners have an acceptable degree of understanding of medical emergency conditions, while the practical confidence level in implementing first aid interventions might be lower, especially among recently graduated dentists and those who do not attend training courses [8]. Moreover, years of experience are considered important factors that enhance preparedness and self-assurance among dental staff when facing such a serious situation [9]. Assessing the knowledge and confidence in this field helps to determine weak and strong points among dental staff. This highlights the importance of developing training programs and improving healthcare quality in dental clinics [10,11]. In addition, this evaluation contributes to supporting and saving patients' lives, which is the dentist's responsibility in the clinical chair. Moreover, it increases the competencies of dental staff and enhances immediate responses to medical emergency cases. Prior research has been conducted on medical emergencies in many countries [12]. Therefore, this study involves the evaluation of knowledge and confidence among Libyan dentists in managing medical emergencies and explores the related factors. This helps provide an educational foundation and training programs for dental staff.

Methods

This cross-sectional study was conducted to assess the knowledge, practice, and confidence of dentists in managing medical emergencies encountered in a dental office. An anonymous online/paper questionnaire was distributed among

Libyan dentists from different Libyan cities. This questionnaire-based survey consisted of three structured questionnaires. The first part included the demographic section. The second part included 23 scenario-based multiple-choice questions evaluating knowledge and practice of identifying the proper management of medical emergency conditions that may occur in the dental chair. The last part consisted of a five-point (Likert scale) evaluating dentists' confidence in managing medical emergencies ranging from the most common to rare events. The scale points ranged from 1: not confident to 5: extremely confident. The questionnaire was designed by the research team based on commonly reported medical emergency scenarios in dental practice and relevant literature. Written and oral informed consent was obtained from all participants before their participation. Participation was voluntary, and all responses were collected anonymously to ensure confidentiality. Descriptive statistics were used to summarise the data and were presented as number (n), percentage (%). Responses to the knowledge-based questionnaire were evaluated according to a predefined answer key.

Results

The demographic information of the dentists who participated is presented in (Table 1). A total of 92 dentists were involved in this study. The largest proportion of participants was aged 36- 45 years (50%), and females represented 64% of the sample. Participants who had more than 10 years of clinical experience were the majority (47.7%). The highest qualification was a bachelor's degree, which accounted for 50% of respondents, while 26.9% held a master's degree. A majority of dentists worked in private practice settings (44.2%).

Table 1. Demographic information

Variable	Category	%
Age	25-35 years	40.2%
	36-45 years	50%
	46-56 years	5.4%
	>56 years	4.3%
Gender	Female	64%
	male	36%
Types of practice	Private	44.2%
	Governmental clinic	19.8%
	University clinic	20.9%
	All of the above	15.1%
Highest qualification	Bachelor`s	50%
	Master's degree	26.9%
	Postgraduate diploma	20.5%
	PhD	The rest
Years of experience	More than 10 years	47.7%
	6-10 years	25.6%
	1-5 years	17.4%
	Less than 1 year	9.3%

As shown in Table 2, the results of the knowledge and practice of most dentists in the management of medical emergencies demonstrate varying proportions across different emergency scenarios. The highest correct response was for the meaning of tachycardia (95.4%), while the lowest response rate was observed for the compression-to-ventilation ratio for adult CPR (60.5%). Although the most common medical emergency that may be encountered in daily practice is syncope, this condition received only 63.2% correct responses. This is considered a relatively low rate, which indicates the gap in knowledge of basic emergency preparedness. However, other responses revealed a moderate level of identifying the early signs and symptoms of some medical emergency situations. A total of 37.9% of the participants attended a first aid and life support training course. Regarding the availability of an emergency kit, 46.2% of participants reported "Yes" and 42.9% answered "No", while the rest were unaware of its availability.

Table 2. Knowledge and practice

Scenario of medical emergency	Responses options	%
Radial artery is used to measure:	Blood pressure	10.6%
	Heart rate	74.1%
	Respiration	2.4%
	All of the above	12.9%
The brachial artery is used to measure:	Blood pressure	69.4%
	Heart rate	15.3%
	Respiration	9.4%
	None of the above	5.9%

Tachycardia means:	The heart rate rises above 100 The heart rate is less than 100 The heart rate is less than 80 None of the above	95.4% 0.0% 1.1% 3.4%
Normal vital measurements for an adult patient are	Pulse 60 to 100 beats per minute, Blood pressure 120/80 mmHg Respiration 12 to 18 breaths per minute a and b None of the above	11.5% 1.1% 85.1% 2.3%
The most common medical emergency occurring in dental practice is:	Hypoglycemia Syncope Hypotension Seizures	32.2% 63.2% 4.6% 0.0%
Dyspnea, wheezing, sweating and perioral cyanosis are all symptoms of:	Angina Asthma Syncope Hypoglycemia	10.5% 72.1% 7.0% 10.5%
Sweating, feeling tired, disorientation, and headache are symptoms of:	Angina Asthma Hypoglycemia Syncope	4.7% 2.3% 80.2% 12.8%
Signs and symptoms of anaphylaxis reaction are:	Cyanosis, swelling of face, tongue and lip Severe itchy erythematous rash Rapid pulse All of the above	3.4% 6.9% 3.4% 86.2%
Sweating, pain in chest referred to the left arm, neck and into the left mandible are signs and symptoms of	Asthmatic attack Ischemic shock Angina Tachycardia	1.1% 10.3% 82.8% 5.7%
How do you position a patient having a syncope attack?	Lie down or sit with their head between their knees for at least 10 to 15 minutes. Lie down with the patient's legs raised above heart level if possible All of the above None of the above	4.7% 70.6% 23.5% 1.2%
.....is used to measure the level of blood sugar	Glucometer Glucose tolerance test Pulse oximeter None of the above	74.7% 13.8% 1.1% 10.3%
How do you deal with a patient experiencing an epileptic attack?	Inject atropine Inject cyclosporine Inject diazepam Inject epinephrine	6.0% 0.0% 91.7% 2.4%
The recommended drug and dose for anaphylaxis is:	1:1000 IV Corticosteroid 1:100 IM Epinephrine 1: 1000 IM Epinephrine 1:1000 IV Epinephrine	11.8% 7.1% 67.1% 14.1%
Route of administration of epinephrine in anaphylaxis:	IV IM in the lateral thigh Subcutaneous Oral	23.8% 75% 1.2% 0.0%
How do you manage a patient with no pulse?	Call help and start CPR Transport him to the hospital immediately without any intervention Inject 1:1000 IM Epinephrine None of the above	90.5% 2.4% 6% 1.2%
In case of angina, the drug of choice is:	Sublingual Nitroglycerine Oral Dilantin	91.7% 4.8%

	IV saline	0.0%
	Corticosteroid	3.6%
Initial management of a hypoglycemic patient who is unconscious:	IV glucagon or dextrose	77.6%
	Give oral sugar	17.6%
	Sit patient upright	4.7%
	Epinephrine IM	0.0%
First step in managing an asthma attack in a dental clinic:	Give epinephrine	6.9%
	Use patient's own inhaler and oxygen	88.5%
	Start CPR	4.6%
	Call an ambulance without treatment	0.0%
Compression-to-ventilation ratio for adult CPR is:	15:2	13.6%
	30:2	60.5%
	5:1	13.6%
	Continuous compression only	12.3%
Which local anesthetic has the highest risk of allergy:	Lidocaine	8.1%
	Articaine	15.1%
	Esters like procaine	68.6%
	All have the same risk	8.1%
Have you ever attended training in first aid and emergency life support courses?	Yes	37.9%
	No	62.1%
	If yes, how many times have you attended?	46.4%
	once	
Have you encountered a medical emergency before?	Yes	61.6%
	No	38.4%
Is there an emergency kit in your clinic?	Yes	46.2%
	No	42.9%
	I do not know	10.7%

From Table 3, an Independent-sample t-test was used to assess the impact of clinical resources and attending a first aid training program on dentists' mean confidence levels. The outcomes showed statistically significant differences for both factors. First, the mean confidence level among dentists who work in clinics provided with a first aid emergency kit demonstrated a moderate to high confidence level according to the five-point Likert scale criteria, compared to those without access to an emergency kit ($p < 0.001$). Similarly, participants who had attended first aid training exhibited significantly greater self-confidence than their untrained counterparts ($p = 1.24 \times 10^{-10}$, $p < 0.001$). Overall, these findings indicate that both the structural availability of emergency equipment and formal emergency training are important independent determinants in substantially enhancing dentists' confidence.

Table 3. Results of the Likert scale

Statement	Not confident at all	Slightly confident	Moderately confident	Very confident	Extremely confident
Syncope	17 (19.5%)	16 (18.3%)	24 (27.5%)	12 (13.7%)	18 (20.6%)
Hypoglycemia	7 (8.0 %)	13 (14.9%)	23 (26.4%)	20 (22.9%)	24 (27.5%)
Epileptic seizures	14 (16%)	33 (37.9%)	24 (24.5%)	7 (8.0%)	9 (10.3%)
Asthma	15 (17.2%)	25 (28.7%)	27 (31.0%)	10 (11.4%)	10 (11.4%)
Anaphylaxis	18 (20.6%)	29 (33.3%)	25 (28.7%)	7 (8.0%)	8 (9.1%)
Adrenal crisis	38 (43.6%)	22 (25.2%)	16 (18.3%)	9 (10.3%)	2 (2.2%)
Angina	32 (36.7%)	22 (25.2%)	22 (25.2%)	6 (6.8%)	5 (5.7%)
Performing CPR	33 (37.9%)	22 (25.2%)	17 (19.5%)	8 (9.1%)	7 (8.0%)
Managing local anaesthetic toxicity	24 (24.5%)	26 (29.8%)	24 (24.5%)	7 (8.0%)	6 (6.8%)
Overall confidence in managing medical emergency	17 (19.5%)	24 (24.5%)	27 (31.0%)	15 (17.2%)	4 (4.5%)

Discussion

Although a medical emergency in a dental clinic does not frequently occur, serious life-threatening events might occasionally be encountered [12]. A dental office is a stressful environment for many patients seeking dental treatment, as it involves clinical activities in which patients are at risk of medical emergencies, especially medically compromised patients [13]. As lifestyle has changed and healthcare has improved, patients with complex medical conditions have

increased; therefore, dentists are increasingly treating such patients [14,15]. The incidence of medical events in a dental office varies, as previous research indicates. Syncope is the most frequent minor medical emergency encountered by dental professionals, while the most serious life-threatening events such as cardiac arrest are rare [12]. This survey revealed a significant disparity between the theoretical and clinical competencies, with participants exhibiting a high level of understanding of the management of medical crises in contrast to limited clinical proficiency. Several Studies have demonstrated a gap between theoretical knowledge and clinical confidence in dealing with encountered medical emergencies [12,13,16]. The deficiency in practical skills was justified by the absence of training and lack of updates after graduation, as well as a lack of workshops in the undergraduate curriculum [17].

Dentists and students demonstrate a high level of theoretical knowledge about the most common medical emergencies, and this knowledge decreases for more advanced events [16]. Moreover, the level of confidence is low compared to the level of knowledge. However, most studies showed that dentists and students have a lack of confidence in managing complex medical emergencies, which leads to refusing or avoiding the treatment of patients with a high risk of a medical emergency by dental practitioners [13]. In addition, research reveals a lack of clinical preparedness. Approximately 20% of dental offices lack emergency equipment, while other clinics have scarce equipment [16]. The availability of an emergency kit in a dental clinic is associated with increased self-perceived competence and willingness to treat high-risk patients [16]. These previous findings are consistent with the results of this study. The findings of this assessment related to self-confidence revealed that dentists are not fully prepared to handle medical situations, with adrenal crises being the most challenging scenario, as shown in Table 3. 43.6% of dentists are not confident at all in dealing with such crises, followed by performing CPR (37.9%) and angina (36.7%), respectively, while the highest confidence level was reported for managing hypoglycemia. The majority of the remaining responses fell within the slightly to moderately confident ranges.

Conclusion

While these investigation results indicated that dentists possess adequate theoretical knowledge regarding medical emergencies and their management, their practical competency was found to be deficient, coupled with a lack of confidence in managing life-threatening emergency situations. The results of previous studies emphasize the importance of preparing dental staff with structured, hands-on training and providing access to essential emergency resources. Moreover, providing dental clinics with essential emergency equipment and medication, which in turn gives the confidence of dental practitioners to treat all patients. Therefore, this survey strongly recommends incorporating mandatory emergency training programs into the dental internship curriculum, with yearly updates to ensure competency retention.

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Conflict of interest. Nil

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