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Awareness of Newly Graduated Iraqi Dental Students to Medical Emergency Issues Related to Dental Work

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Aim: The current study aims to evaluate the awareness of a group of newly graduated Iraqi dental students to medical emergency issues related to dental work.
Materials and Methods: This cross-sectional study was conducted during the period from July 2023 to July 2024 and included 110 newly graduated students from College of Dentistry, Mustansiriyah University/ Baghdad-Iraq who agreed to participate and answered a questionnaire that consisted of 27 questions classified into three domains: the first domain about general medical issues, the second and third domains about emergency issues and its management during dental practice. After calculating total number of the correct responses for the questions of each participant, the participants were categorized according to their level of awareness as poor, fair or good.
Results: The level of awareness of the participants to medical emergency issues related to dental work was poor in 5%, fair in 65% and good in 30% of them. The total correct answers of the participants to the three domains of the questionnaire was ranged from 4-22 and the mean ± SD was 14.96 ± 3.45. The correlation analysis of the numbers of the correct answers among the three domains of the questionnaire showed a positive statistically significant correlation between first and second domains as well as between second and third domains ($P<0.001$).
Conclusion: There is a deficient awareness about medical emergency issues during dental practice among newly graduated dental students indicating the need for training courses in medical emergencies for dental students before and after graduation.

Key words: knowledge, dentists, emergencies training courses, emergency kit, academic curricula

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Introduction

Medical emergencies are serious issues that need immediate intervention by well-trained personnel who have the skills to manage these conditions through rapid assessment, immediate provision of appropriate intervention, and prompt transportation to the nearest appropriate health facility. [1]

During dental treatment, a patient may be exposed to a medical emergency and the dentist must be able to take over the condition to decrease morbidity and mortality [2] especially in old age and in medically compromised individuals who are at a higher risk for such conditions. [3] The dental clinic must be equipped with the necessary supplies to manage medical emergencies including an emergency kit containing key basic drugs to cope with such situations and to prevent consequences or legal troubles. [4]

The most common medical emergencies during dental work are anxiety, compromised airway, and an aspiration of a dental instrument. Other emergencies include syncope, postural hypotension, allergic reaction, adrenal insufficiency, hyperventilation, status asthmaticus, status epilepticus and cardiac pain. [5]

It is essential to evaluate the knowledge of newly graduated dental students about the main topics of medical emergencies in dental work. Such evaluation can provide the necessary information about the adequacy of academic curricula and that could be reflected as recommendations for curricula development and recommendations for the need of appropriate training courses after graduation. [6,7,8,9,10]

Materials and Methods

This cross-sectional study was conducted during the period from July 2023 to July 2024 and included newly graduated students from College of Dentistry, Mustansiriyah University/ Baghdad-Iraq. All the newly graduated students of the academic years (2022-2023) and (2023-2024) were invited to participate in this study and 110 of them were agreed to participate. The participants were able to ask questions about the study and get the appropriate explanation without any hint that lead their answers. The researcher clearly notified the participants to answer the questions accurately.

The questionnaire administrated in this study has based on a previously used one [11] and consisted of three domains:

The first domain included five questions that ask the participants about general medical issues to show if they took medical history and obtained vital signs during dental work, and if they were able to give intramuscular and intravenous injections.

The second domain included fifteen questions that asked the participants about their information's related to some emergency issues in dental practice. The participants were asked if they ever attended programs for training or management of emergencies and if they think they can handle medical emergencies. Also they asked them about the presence of an emergency kit in dental clinic. The participants were asked if they knew the indications of some drugs used in emergencies including adrenalin, oral glucose, ammonia inhalant, hydrocortisone and atropine. Moreover, they were asked about drugs that are used for anaphylaxis and angina pain. Other questions were about patients with prosthetic heart valve, how to extract tooth for them and what are the dental procedures that can be performed to them without antibiotic cover? In addition, the last three questions asked about meaning of the abbreviation BLS, the location of chest compression, and the rate of cardiopulmonary resuscitation.

The third domain included seven questions about the management of some medical emergencies during dental practice.

The participants were asked about their management of the following emergencies: airway obstruction, spontaneous bleeding after extraction, syncope, patient not responding to dentist even after shaking and shouting and patient with epileptic fits. In addition, the participants were asked about what can be done to do mouth to mouth CPR and how to give rescue breathing in infants.

After summation of the number of correct responses to the three domains of the questionnaire for each participant, the participants were categorized into three groups according to their level of awareness of medical emergencies during dental practice and as follows:

- First group (**Poor awareness**) included the participants who have answered correctly < 50% of the questions.
-Second group (**Fair awareness**) included the participants who have answered correctly >50% but <75% of the questions.
-Third group (**Good awareness**) included the participants who have answered correctly > 75% of the questions.

Data analysis

The data analysis was done with (IBM SPSS Statistics) version 24 including descriptive statistics (numbers, percentages, range, mean and standard deviation). Spearman rank correlation analysis was conducted to measure the correlation of the summation of the total correct answer among the three domains of the questionnaire.

Results

The response rate of the participants on the first domain of the questionnaire (general medical issues) showed that 100% of them asked the patients about their medical history but only 43.6% of them obtained the vital signs of the patients (table 1).

Table 1: Number and percentage of the correct answers about general medical issues among group of newly graduated dental students

	Questions	Correct answers N(%)
Q1	Do you take medical history from patient	110 (100)
Q2	Do you obtain filled health history (case sheet)	101 (91.8)
Q3	Do you obtain the vital signs	24 (43.6)
Q4	Can you give an intramuscular injection	64 (58.2)
Q5	Can you give an Intravenous injection	32 (29.1)

The response rate of the participants on the second domain of the questionnaire (emergency issues related to dental work) showed that the positive responses on the questions that if they had ever attended a program for training or for management of medical emergencies, if they think they can handle emergencies and if an emergency kit is available in the dental clinic, were 31.8 %, 27.3% and 39.1%, respectively. Concerning the drugs that are used in emergencies, the participants were asked if they know the indications for adrenalin, oral glucose, ammonia inhalant, hydrocortisone or atropine. Positive responses were 70%, 97.3%, 36.4%, 60% and 36.4%, respectively. When the participants were asked about the drugs that are used for anaphylaxis and angina pain, rates of correct answers were 46.4% and 75.5%, respectively. Other questions had involved asking participants about patients with prosthetic heart valve, how to extract tooth for them and what are the dental procedures that can be performed on them without antibiotic cover? . The correct answers were 67.4% and 60%, respectively. The rate of correct answers to the last three questions that were asked about the meaning of the abbreviation (BLS), the location of chest compression and the rate of cardiopulmonary resuscitation were 65.5%, 48.2% and 50%, respectively (table 2).

Table 2: Number and percentage of the correct answers about emergency issues related to dental work among group of newly graduated dental students

	Questions	Correct answers N(%)
Q1	Have you attended emergency management programs	35 (31.8)
Q2	Do you think you can handle emergency conditions	30 (27.3)
Q3	Are emergency kits available in your dental office	43 (39.1)
Q4	Do you know the indications of **(Adrenaline)**	77 (70)
Q5	Do you know the indications of **(Oral glucose)**	107 (97.3)
Q6	Do you know the indications of **(Ammonia inhalant)**	40 (36.4)
Q7	Do you know the indications of **(Hydrocortisone)**	66 (60)
Q8	Do you know the indications of **(Atropine)**	40 (36.4)
Q9	What is the first drug of choice in anaphylaxis?	51 (46.4)
Q10	When a patient gets angina pain which of the drugs should be given?	83 (75.5)
Q11	What is your plan for extraction of a tooth to patient with prosthetic heart valve?	84 (67.4)
Q12	What dental procedures performed to patients with prosthetic heart valve without giving antibiotic prophylaxis?	66 (60)
Q13	What is the abbreviation of BLS?	72 (65.5)
Q14	What is the location of chest compression?	53 (48.2)
Q15	What is the rate of cardiopulmonary resuscitation (CPR) in adult	55 (50)

The response rate of the participants to the third domain of the questionnaire (managements of some emergencies during dental work) was shown in table 3. They were asked about their management of the following emergencies: airway obstruction, spontaneous bleeding after extraction, syncope, even after shaking and shouting patient not responding to dentist and patient with epileptic fits, the correct answers were 82.7%, 67.3%, 71.8%, 58.2% and 56.4% respectively. Additionally, the rate of correct answers about asking the participants about what can be done to do mouth to mouth CPR and how can you rescue breathing in infants, were 40.9% and 24.5% respectively.

Table 3: Number and percentage of the correct answers about the managements of some emergencies during dental work among group of newly graduated students

	Questions	Correct answers N (%)
Q1	What does management of airway obstruction due to aspiration of foreign body include	91(82.7)
Q2	The primary management of spontaneous bleeding after extraction include	74(67.3)
Q3	What is the immediate action to a patient suffered from syncope	79(71.8)
Q4	What is the immediate action to a patient not responding to you even after shaking and shouting at him	64(58.2)
Q5	What is the primary management in case of epileptic fits	62(56.4)
Q6	If you do not want to give mouth to mouth CPR, the following can be done except	45(40.9)
Q7	How do you give rescue breathing in infants	27(24.5

Table 4 shows the number and percentage of the participants according to their level of awareness to medical emergency issues related to dental work. It was poor awareness in 5% of the participants, fair awareness in 65% of the participants and good awareness in 30% of the participants.

Table 4: Number and percentage of the participants categorized according to their level of awareness to general medical issues in addition to informations and managements related to emergency issues during dental practice

Awareness category	Number	Percentage
Poor awareness	33	30%
Fair awareness	71	65%
Good Awareness	6	5%
Total	110	100%

The mean ± SD of the number of total correct answers of the participants to the three domains of the questionnaire was 14.96 ± 3.45 and the range was (4 - 22) questions. The correlation analysis of the number of correct answers among the three domains of the

questionnaire showed a positive statistically significant correlation between the first and second domains in addition to that between the second and third domains (P<0.001) (table 5).

Table 5: Descriptive statistics and correlation of the summation of the total correct answers of the three domains of awareness of medical emergency issues among newly graduated dental students

Domain	Rang of correct answers	Mean±SD	Correlation between 1st & 2nd domains		Correlation between 1st & 3rd domains		Correlation between 2nd & 3rd domains	
First	1-5	3.22±0.90	R	P	R	P	R	P
Second	1-13	8.20±2.39	0.339	0.000	0.30	0.759	0.343	0.000
Third	1-7	4.03±1.34						
Total	4-22	14.96±3.45						

Discussion

In this study, an assessment of the awareness of newly graduated dental students about medical emergencies issues was conducted. Although the medical emergencies are not daily routine in dental work, it was stated that the dentists should be aware and well-trained about these conditions since its occurrence may threaten the lives of patients. [12]

It is a part of routine work that the dentist should take the medical history for all patients and the vitals should be recorded at the first visit for every patient and in every visit for the medically compromised patients to prevent any medical consequences. [13] In this study, the positive response rate about taking medical history and the vitals were (100% and 43.6%) respectively which are comparable to the results of other studies.[11,14]

In spite of the approved basics in dental practice which state that training and managements programs for emergencies and the availability of emergencies kit in dental clinic are necessary [12, 13], the results of this study showed a low percentage of enrollment in programs for training or management of emergencies (31.8%). In consequence, there is a deficiency in some skills which can be gained by these courses like doing IM or IV injection among participants. In addition, only 39.1% of them knew about the presence of emergency kit in the clinic and these results were lower than that obtained in other studies. [14, 15,16]

The participants in this study were asked if they know the indication of some drugs used in emergencies and the responses revealed that only for oral glucose, they indicated by 97.3% a positive response while concerning hydrocortisone and atropine, just 36.4% knew the indications. Moreover, only 46.4% of them knew that the drug used for anaphylaxis is adrenalin and these results were comparable with an another study. [11]

Regarding other questions asking participants about patients with prosthetic heart valve, how to extract tooth and what dental procedures can performed without antibiotic cover for them and asking participants about the meaning of the abbreviation BLS, the location of chest compression and the rate of cardiopulmonary resuscitation, the correct answers had ranged between 48.2% and 67.4% which are comparable with some differences to other studies. [13, 14]

Some of medical emergencies during dental work can cause death if not managed appropriately by the dentist [17, 18] like airway obstruction due to aspiration of foreign body during dental treatment which is a serious life-threatening medical emergency. [19] In this study, the percentage of correct answers of the participants on the management for this condition was 82.7% which is higher than that in other studies. [14, 15, 16]

Syncope is a common emergency in the dental work [20] but only 71.8% of the participants knew how to manage syncope.

Although epilepsy is a serious disease affecting brain and causes seizures or unusual behaviour as well as involuntary muscle contractions and temporary loss of consciousness [21], the management of epileptic fit during dental work is easy and is just to make patient lie on the lateral position and wait for seizures to end but only 56.4% of the participants knew the management which is comparable to previous study. [11] In addition, the correct responses were comparable with other studies concerning the questions about what can be done to accomplish mouth to mouth CPR and how can you give rescue breathing in infants. [15, 16]

The level of knowledge of dentists about oral disease [10] and preventive measures [22] were already studied but it is noted that a medical-emergency-related knowledge [6] should also continuously emphasized since this would have a reflection on their performance in promotion of health of their clients.

Conclusion

The results of this study revealed a sort of deficiency in knowing the essential information and management of medical emergency issues in dental practice among newly graduated dental students and give an indication for mandatory training courses in medical emergencies for the dentists after graduation.

Limitations and Recommendations

The sample of this study was convenience sample in which only those agreed to participate were included which is reflected as recommendation to include other colleges of dentistry and compare between them.

Ethical Approval

This study was approved by Ethical committee at College of Dentistry, Mustansiriyah University (REC Reference REC133, Study Number MUPRV005)

Data Availability

Data that support the current study are available from the corresponding author upon reasonable request.

Funding Information

No funding for this study was obtained.

Competing interest

The authors declare that they have no competing interests.

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