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Dentists' preparedness and knowledge of medical emergencies in dental offices in Yasuj City in 2016

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ABSTRACT

Background and Purpose*: Medical emergencies in dental offices are unavoidable. Saving lives and sustaining health of patients against diseases and emergency situations is the most serious challenge in all medical treatment as well as dental treatment, therefore if dentists lack the adequate knowledge and don't know how to cope with such situations, the patient's life will be threatened. This study was carried out to determine dentists' knowledge and preparedness of medical emergencies in dental offices in Yasuj in 2016.*

Material and Method*: This is a descriptive cross-sectional study. Research tool is a questionnaire with 4 parts. Data was gathered and encrypted then transmitted to SPSS software, version 15. Chi-square and Fisher tests were used. Statistical significance level was set at p< 0.05.*

Result: *The highest measure of knowledge belonged to male specialists with mean and standard deviation of [7±1.7] and the least measure of knowledge belonged to female specialists with mean and standard deviation of [5.2±2.5]. Furthermore, female dentists' knowledge of medical emergencies was more than males. There is a significant relation between number of available drugs in offices and gender.*

Conclusion: *Overall, measure of knowledge of dentists in Yasuj City obtained 1.5 ±5.7 which is considered to be average. There is a significant relation between number of available drugs in offices and gender.*

KEYWORDS: *Emergency, Knowledge, Dentist*

INTRODUCTION

Medical emergencies refer to those sudden and unexpected medical situations which pose an immediate risk to a person's life or long-term health if immediate actions won't be taken[1]. Medical emergencies in dental practices are unavoidable and they're one of the most complicated situations a practicing dentist could deal with. Due to the importance of saving lives and sustaining health of patients against diseases and emergency cases in all medical treatment as well as dental treatment, if dentists lack the adequate knowledge and don't know how to cope with such situations, the patient's life will be threatened [2]. Preparedness and ability to deal with medical emergencies in dentistry requires adequate equipment, appropriate medications as well as sufficient scientific background [3].

Every day many people in different countries around the world are subjected to dental treatment from young to elderly. Among them there are patients with various systemic diseases [4]. For example; a study in Netherlands showed 37.2 percent of patients referred to dentists suffered from systemic diseases. The Most frequently problems were Cardiorespiratory, Cerebral diseases and Seizures[5,6]. In a study by Girgler and et al. among 887 British dentists, demonstrated the most common emergency events, reported by dentists, in each year were as followed: Vasovagal Syncope [1.9 cases] Hypoglycemia [0.17 cases] Angina [0.17 cases] Epilepsy [0.17 cases] Choking [airway obstruction] [0.09 cases] Asthma [0.6 cases] Hypertension Attacks [0.023 cases] Anaphylaxis [0.013 cases], MI [Myocardial Infarction] [0.3 cases] and Cardiac Arrest [0.2 cases], respectively [7]. In modern dentistry there are such factors which Increases the occurrence of medical emergencies in dental offices such as; increasing aging population, advances in medical science and survival of a greater number of patients with systemic problems, Patients with tendency to less and prolonged appointments, increases in medications prescribed by dentists [5].

Malamed states in his book that the emergency kit is a set of drugs [Epinephrine, Diphenhydramine, Oxygen, Nitroglycerin, Diazepam, etc.], and equipment [Suction, Suction tips, Tourniquet, Scalpel, Catheter, etc.] which are essential in dealing with life-threatening situations [8]. The results of different studies around the world showed that emergency medications and emergency equipment should be available in a dental office [9-13].

Despite dental emergencies are not common in dental offices and could be highly prevented by taking a medical history and evaluating physical condition of the patient, however emergency situations rarely occur in dental offices and could cause a very dramatic and painful condition, so the dental staff specially dentists should have adequate knowledge in coping with emergency events and prevention alone is not sufficient [2].

Studies and statistics illustrate in 1.1-4.1 percent of emergency situations occurred in dental clinics; included [Cardiopulmonary Resuscitation] or CPR 8. While nearly half of the dentists around the world aren't able to perform CPR correctly [7,14,15]. According to studies Iranian dentists' knowledge considered weak in several cities, therefore they weren't fully prepared to handle medical emergencies and had insufficient training in managing them [3,4,16,17].

Since this study hadn't been carried out in Yasuj before, the aim of this study was to assess the knowledge and preparedness of dentists to manage medical emergencies in 2016, in Yasuj.

MATERIAL AND METHODS

Since the present research describes studied situations for a more reasonable perception and decision, it's descriptive. The study was carried out in a specific year [2016] so it's cross-sectional. The research is practical since it was conducted with the aim of achieving practical results. The studied population was participated dentists in Yasuj who were evaluated by census.

Research tool was a questionnaire with 4 parts designed by the performer et al. The first part was dentists' demographic information including age, gender, year of office foundation, number of patients per day, working hours per day and academic degree [professional doctorate or PhD]. In the second part, five questions were asked about the operation and in the third part, 10 multiple-choice questions were asked about medical emergencies. Eventually, in the final part a list of emergency drugs and equipment, needed for the dentists, was given. This questionnaire was based on a similar study conducted in Kerman. According to Medical Emergencies written by Malamed and the assessments conducted by Malamed. The reliability of this questionnaire, using Coefficient Cronbach's Alpha, was [0.76] and reliability of the questions calculated 0.7-0.95 [2,3,7].

Gathering information was done in dental offices in person. After explaining about the questionnaire, the purpose and the consent were asked from the dentists so that the questionnaires were filled without referring to scientific books. The questionnaire was anonymous and information was confidential. For each correct answer measure 1 and each incorrect answer measure 0 were determined to distinguish dentists with correct answers and dentists whose answers were false then total measure of knowledge was calculated. The minimum measure of knowledge to pass the test was obtained by linear transformation of distance between two numbers, maximum and minimum measure of knowledge were calculated by distance between zeros to ten. Measure 1-5 was considered weak, 6 average, 7 good, and more than 8 was very good [4]. Data was encrypted and then transmitted to SPSS software version 15. T-test and Chi-Square test and Fisher test were used. Statistical significance was set at $p< 0.05$.

RESULTS

Totally 70 dental practitioners in Yasuj participated in this study; 58 [82.9%] general dentists and 12[17.1%] dental specialists. Among them 43[61.4%] were males and 27[38.6%] were females. The average age of participants was 30.2 years with standard deviation of 17.6. The average number of patients referred to dental offices was 7.8 with standard deviation of 5.3. The average working hours per day was 2.1±5.6. Overall 6 participants [8.6%] have been working in their offices before 1996 and 3 dentists [4.3%] have been working between 1997 to 2001, 5 participants [7.1%] have been working between 2002 to 2006, 23 dentists [32.9%] between 2007 to 2011 and 12participants have been working in their offices between 2012 to 2016. Results of second part of the questionnaire are shown in table 1.

Table-1: Results of Second part of the questionnaire.

		General Dentist		Dental Specialist	
		Male	**Female**	**Male**	**Female**
Attending medical emergency workshops in dentistry	Yes	14[24.1%]	7[12.1%]	3[25.0%]	2[16.7%]
	No	23[39.7%]	14[24.1%]	3[25.0%]	4[33.3%]
Be trained in medical emergency workshops in university	Yes	30[51.7%]	16[27.6%]	4[33.3%]	6[50.0%]
	No	7[12.1%]	5[8.6%]	2[16.7%]	0[0.0%]
Demand to be trained again	Yes	33[56.9%]	20[34.5%]	5[41.7%]	5[41.7%]
	No	4[6.9%]	1[1.7%]	1[8.3%]	1[8.3%]
Serum injection ability	Yes	19[32.8%]	7[12.1%]	3[25.0%]	3[25.0%]
	No	18[31.0%]	14[24.1%]	3[25.0%]	3[25.0%]
intramuscular injection ability	Yes	33[56.9%]	16[27.6%]	6[50.0%]	5[41.7%]
	No	4[6.9%]	5[8.6%]	0[0.0%]	1[8.3%]
The experience of encountering medical emergencies over the past one year	Yes	15[25.9%]	13[22.4%]	2[16.7%]	2[16.7%]
	No	22[37.9%]	8[13.8%]	4[33.3%]	4[33.3%]
Taking medical history of patients	Yes	37[63.8%]	21[36.2%]	6[50.0%]	6[50.0%]
	No	0[0.0%]	0[0.0%]	0[0.0%]	0[0.0%]

Taking history of any medical emergency experiences during previous dental treatment	Yes	36[62.1%]	21[36.2%]	6[50.0%]	5[41.7%]
	No	1[1.7%]	0[0.0%]	0[0.0%]	1[8.3%]

According to results of table 3, due to gender [female and male] and academic degree [general dentist, dental specialist] highest measure of knowledge belonged to male specialists with mean and standard deviation of [7±1.7] and the least measure of knowledge belonged to female specialists with mean and standard deviation of [5.2±2.5]. Furthermore, female dentists' knowledge of medical emergencies was more than males.

Table-2: Knowledge of medical emergencies due to gender [male, female] and academic degree

	General Dentist	**Dental Specialist**	**total**
Male	5.4±1.4	7.0±1.7	5.6±1.5
Female	6.1±1.2	5.2±2.5	5.9±1.6
total	5.6±1.4	6.1±2.2	5.7±1.5

Table-3: T-test results

T-test **Results** **Variables**	**T statistics**	**P-value**	**Mean Difference**	**95%of difference**
Mean measure of knowledge in gender	-0.81	0.42	-0.31	[-1.1,0.45]
Mean measure of knowledge in academic degree	-0.69	0.51	-0.46	[-1.9 , 1.0]

The independent samples t-test are used to compare mean measure of knowledge for males and females and general dentists and dental specialists. The mean measure of knowledge was 1.4±5.6 for general dentist and 2.2±6.1 for dental

specialist [p-value =0.51]. The result shows there's not a significant difference for the mean measure of between male and female dentists.

Table 4 illustrates frequency and percentage of suggested drugs by dentists for dental offices. According to results of table 5 some recommended drugs were as followed; Nitroglycerin pills, Dextrose, Hydrocortisone Vial, Adrenaline, and Diazepam Vial which were proposed by more than half of dentists to be maintained in dental offices. The least recommended drug was Sodium Bicarbonate which was only suggested by [5.7%] of dentists.

Table-4: frequency and percent of suggested drugs by dentists

Suggested drug	frequency	percent
Nifedipine	6	8.6
Nitroglycerin pill	62	88.6
Dopamine	6	8.6
Adrenaline	41	58.6
Antihistamine Vial	32	45.7
Hydrocortisone Vial	44	62.9
Sodium Bicarbonate	4	5.7
Oxygen	64	91.4
Bronchodilator Inhaler	18	25.7
Ammonia	12	17.1
Glucose	47	67.1
Atropine Vial	17	24.3
Ringer Serum	20	28.5
Diazepam Vial	40	57.1

Due to table 5 among 29 determined drugs and equipment the most common emergency equipment and drugs in dental offices were; Suction, Suction tip, Oxygen, Scalpel, Nitroglycerin pills, Epinephrine Vial, respectively. Which were available in over the half of dental offices. Verapamil was the least common drug.

Table-5: Available emergency drugs and equipment in offices

Type of drug	frequency	percent
Epinephrine Vial	42	60
Diphenhydramine Vial	13	18.6
Oxygen	60	85.7
Nitroglycerin pills	49	70
Diazepam Vial	25	35.7
Verapamil	3	4.3
Antihistamine Vial	16	22.9
Nifedipine	10	14.3
Lidocaine	59	84.3
Procaine	16	22.9
Sodium Bicarbonate	5	7.1
Bronchodilator Inhaler	12	17.1
Phenylephrine	5	7.1
Dextrose	21	30
Hydrocortisone Vial	26	37.
Propranolol	13	18.6
Atropine Vial	10	14.3
Ammonia	5	7.1
Glucose	22	31.4
Sodium Serum	19	27.1
Ringer Serum	8	11.4
Dopamine	8	11.4
Suction	62	88.6
Suction Tip	61	87.1
Tourniquet	11	15.7

Scalpel	52	74.3
Cricothyrotomy Needle	12	17.1
Angiocath	21	30
Serum Set	29	41.4

By evaluating available drugs in offices in 83% of offices Capsule, in 15.6% CPR kit, in 2.8% Ambu bag and in1.4% lead shielding were maintained. In 14.2% of offices no emergency equipment was reported. Therefore, a significant deficiency is observed in required emergency equipment in dental offices.

Chi-square and Fisher exact tests used to assess the relation between variables. There was a significant relation between gender and the number of available emergency drugs [p=0.008]. There wasn't significant relation between gender and measure of knowledge[p=0.6], the year of office foundation and measure of knowledge[p=0.33], the year of office foundation and the number of available emergency drugs[p=0.54], number of patients per day and measure of knowledge[p=0.65], number of patients per day and the number of available emergency drugs[p=0.95], academic degree and measure of knowledge[p=0.09] and academic degree and the number of available emergency drugs [p=0.78].

DISCUSSION

According to findings over the half of dentists hadn't attended medical emergency workshops. Moreover, more than ¾ of dentists were trained for medical emergencies in university, while 90% demanded to be trained again for medical emergency situations. So, it can be concluded universities couldn't provide an appropriate training for students.

Nearly half of dentists have encountered at least one of the medical emergency cases over the last year, which is a high prevalence, thus it's required to provide special measures to prevent and control such events. In an assessment carried out in southern provinces of Saudi Arabia demonstrated approximately 67% of dentists faced with emergency situations over the past 3 years which is greater than present studied population. In population of Saudi Arabia less than 45% dentists had the ability to perform CPR and less than 1/3 equipped with basic emergency kits and drugs in their offices [18].

Taking medical history of patients prior to starting the treatment is a substantial step in preventing medical emergencies which is fortunately done by all dentists. Over 90% of cases the experience of medical emergency in previous dental treatment was recorded. These two procedures provide an appropriate diagnostic field for dentistry as well as medical science [19]. According to results shown in table 2, knowledge of medical emergencies of female dentists evaluated higher than males, however it wasn't statistically significant [p=0.06]. There is a significant relation between gender and available drugs in offices [p=0.008]. In Amir Chaghmaghi study the mean measure of knowledge in males was higher than females [20], which is in conflict with results of present study. However in Mollashahi's

research there wasn't statistical significant relation between males and females' measure of knowledge which is similar to results of this study [21].

A study by Hashemipour in Kerman, in 2007, demonstrated that 24.7% of dentists have coped with emergency cases. Among them the most frequent situation was Vasovagal Syncope. Their mean measure of knowledge evaluated 5.89 of 10. Total average number of emergency medications and equipment in their offices were 19.6% and 31.4%, respectively [4]. In a study conducted in 2012 by Praveen and et al Ankola in Belgaum City, in India, showed that most of the dentists were finely prepared to face with medical emergencies. Moreover it demonstrated Vasovagal Syncope was the most frequent medical emergency followed by; Hypoglycemia, Epilepsy Seizures and Respiratory Attacks, respectively [22].

In a research by Khami and et al. in 2014, stated less than 60% of dentists in Tehran City had adequate knowledge about symptoms of Hypoglycemia, Chest Pain of Cardiac Origin and performing CPR correctly, as well less than 25% could pass the test [23].

In 2014 Nawab Azam and et al. claimed according to knowledge, performance and access to equipment and medication the mean measure of knowledge and performance were higher in female dentists rather than males in Yazd [Iran]. Furthermore, there was a direct and significant relation between measure of knowledge and performance which is both in conflict with results of present study. It also demonstrated knowledge and performance of general dentists in Yasuj City considered average. Therefore, updating medical emergency knowledge particularly for those who had been graduated for a considerable years ago, seems essential. It should be noted the questionnaire wasn't like the questionnaire used in this study. It was also designed by performer [24]. In present study, the most available drug in offices was Nitroglycerin [70%]. In Athertone et al. research the most reported drug was Glucose and the most available equipment was Tracheal Tube in different sizes. While only 31.4% of offices contained Dextrose [25]. Amirchaghmaghi stated there was a significant inverse relationship between age, work experience and measure of knowledge. Therefore, the more age and work experience were, the less measure of knowledge is achieved. It 24could be because of their less updated information [20]. In Mollashahi and et al. study in Zahedan City there wasn't significant relation between measure of knowledge and age or measure of knowledge and year of graduation [21].

CONCLUSION

Overall, knowledge of medical emergencies in dentistry, in Ysouj, in 2016 obtained1.5 ±5.7 which is deemed to be average. There is a significant relationship between gender and number of available medications in offices, however there wasn't significant relation between gender and measure of knowledge, year of office foundation and measure of knowledge, number of available drugs in offices and measure of knowledge, number of patients per day and measure of knowledge, academic degree, and measure of knowledge. Thus, it's recommended further studies provide standard questionnaire as well as constant evaluation of dentists' preparedness and knowledge of medical emergencies in a greater statistical population.

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