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Awareness of dentistry students in managing cardiopulmonary emergencies in two university of Tabriz city of Iran: Should we be worried?

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Abstract

Introduction: Cardiac arrest is one of the most common causes of mortality, and incidence of cardiac arrest as well as need to CPR in dentistry offices is not uncommon. Thus, dentists should be fully familiar with the manner of CPR. This study aimed to examine the awareness of dentistry students at Islamic Azad University and Medical Sciences University in Tabriz city about the manner of management of cardiopulmonary emergencies. In this cross-sectional study, 110 last year dentistry students at dentistry faculties of Tabriz city (governmental and private) were classified randomly. The level of awareness of the students was evaluated using a researcher-made questionnaire whose reliability and validity were examined and confirmed. The questionnaire in addition to demographic information contained 16 items on awareness measurement. The answers were multiple choice, and one score was assigned to each correct response. Ultimately, the awareness score was calculated as sum of scores of correct responses. Data analysis was done using SPSS 21, and t-test. the awareness score was significantly higher at governmental university (8.03±2.18) than at Azad university (7.07±2.0). Also, 36.4% of the students had poor awareness, 60.6% had average awareness, and 2.7% good awareness about management of cardiopulmonary emergencies. The students' level of awareness about management of cardiopulmonary emergencies did not have a significant difference based on gender or academic semester. The present study results indicated poor awareness and knowledge of dentistry students in Tabriz city (governmental and Azad) with regards to CPR.

Keywords: cardiac arrest, CPR, dentistry student

Introduction

Heart disease is one of the most common diseases worldwide, associated with high morbidity and mortality, and imposing a significant burden on the healthcare system (1-3). Cardiac arrest is the most common cause of mortality in developed countries (4). Most individuals who experience cardiac arrest die before reaching the healthcare center (5,6). Thus, immediate interventions in the form of cardiopulmonary resuscitation (CPR) contribute to delaying the probability of mortality. Typically, the patients who do not receive CPR are three times more likely to die than those who receive CPR (2.5 against 8.2% (7). CPR is an emergency intervention aimed to reestablish blood delivery to the vital organs through compressing the rib cage with or without artificial respiration (8). Although CPR is done due to medical emergencies, sometimes it also performed due to dentistry emergencies as well. Occasionally, patients may experience cardiac arrest on the dentistry seat, whereby CPR can be lifesaving (9,10).

There is low probability of facing cardiac arrest in dentistry clinics. Nevertheless, it is not zero (9-13). The first report of cardiac arrest in dentistry clinic was published in 1991 (9). According to a study in 2001, the prevalence of cardiac arrest in the USA was 0.008 per 1 case annually (10). Another study in Britain indicated that the probability of confronting cardiac arrest is 2 per every 1000 patient (11). The research done in Australia also indicated that Australian dentists annually face 1-7 cases of cardiac arrest (12).

Nevertheless, the cases requiring CPR in dentistry students are rare. Dentists as one of the healthcare team members should be fully familiar with the method of CPR. Nevertheless, very sparse studies are available about examining the skills of dentists for CPR (13-15). The results of a study in Tehran in 2019 evaluating the extent of awareness of last year medical students about manner of CPR indicated their unfavorable level of awareness in this regard (16).

The aim of this cross-sectional study was to evaluate the awareness of last year dentistry students at Tabriz University of Medical Sciences and Islamic Azad University about manner of CPR in dentistry clinics. The results of this study can contribute to the requirement of organizing educational courses on the manner of CPR and predicting academic credits in this regard.

Method:

Design of Instrument: First, to design the study instrument, items that were within the scope of proposal aims (proper management of cardiopulmonary emergency) were designed under supervision of the supervisor and using library as well as internet references. Next, a draft form of the questionnaire was prepared consisting of 5 sections including two items related to demographics, 2 items linked to presentation and history of participation in CPR training classes, 16 items related to awareness measurement, 1 item linked to self-evaluation, and 1 item related to the necessity of class presentation.

Feasibility study was completed as pilot on 5 subjects using a trained inquirer in the form of face-to-face interview, and then evaluated. Thereafter, the validity (face and content)

as well as reliability of the questionnaire were inspected. The face validity was determined using quantitative and qualitative methods with 7 students. To determine the content validity, judgment of 6 experts in this regard was used, where content validity ratio (CVR) and content validity index (CVI) coefficients were used quantitively. The reliability measurement was done using internal consistency and stay ability. The internal consistency of the instrument items was checked using Cronbach alpha and on 40 subjects. The stay ability (test-retest method) was also done using intraclass correlation coefficient (ICC) for 40 subjects. According to the results of reliability test of the instrument, Cronbach alpha was calculated 0.885 and ICC 0.88. Thus, no item needed revision or omission.

Evaluation of students: In this cross-sectional and validation study, 110 last year medical students at dentistry faculties of Tabriz city were randomly classified, and in line with the volume of such students at Islamic Azad and Medical Sciences Universities, they were chosen in 2022-2023. The individuals participate in the research after receiving their consent.

The final questionnaire included 20 items consisting of 2 items related to demographics, 2 items linked to presentation and history of participation in CPR training classes, 16 items related to awareness measurement, 1 item linked to self-evaluation, and 1 item related to the necessity of class presentation as multiple-choice, and filled by participants in a written format. Ultimately, the awareness score of the subjects was calculated based on the key of items (assignment of score 1 to each correct response) as sum of scores of the correct responses.

For data analysis, SPSS 21 was used. Data normality was tested by Shapiro-Wilk test, and normal data distribution was found. Thus, for comparing the level of awareness in terms of gender, academic semester, and type of university, t-test was employed.

Results

In this study, 110 last year dentistry students of dentistry faculties in Tabriz city were investigated. Fifty-four (49.1%) were from governmental University and 56 (50.9%) from Azad University. Also, 55 students were male and 55 were female. Further, 91.8% of all students had not participated in CPR training classes, and only 6.4% presented some content as instructor in CPR training classes. According to the self-evaluation of students, 30.9% had preparation for CPR, and 26.3% considered organizing educational classes as essential.

The results of Table 1 show that the awareness score of the students has been significantly higher in the governmental University compared to the Azad University. Also, 36.4% of the students had weak awareness, 60.6% had average awareness, and 2.7% showed good awareness regarding management of cardiopulmonary emergencies (Table 2).

The awareness score of the students did not show significant difference between male and female students in both governmental and Azad Universities (Diagram 1). The awareness score of the students did not show any significant difference either at different academic semesters in the two universities (Diagram 2).

During semester 10, the emergency score of female students was significantly higher than that of their male counterparts in the governmental University, but there was no

significant difference in Azad University. During semester 11, no significant difference was found between the awareness score of females and males in both of the universities (Table 3).

Table 1. Comparing the awareness score of students about the manner of management of cardiopulmonary emergencies in terms of type of university

	Mean	SD
Governmental	8.0370	2.18021
Azad	7.0714	2.09638
P VALUE		**0.020**

Table 2. The frequency of the level of awareness about the manner of management of cardiopulmonary emergencies in terms of university

Total	**Azad University**	**Governmental university**	
(%4.63)04	(%9.24)42	(%6.92)61	Poor
(%9.06)76	(%4.55)13	(%7.66)63	Average
(%7.2)3	(%8.1)1	(%7.3)2	Good

Diagram 1. Comparing the awareness score of students about the manner of management of cardiopulmonary emergencies in terms of gender in the two universities

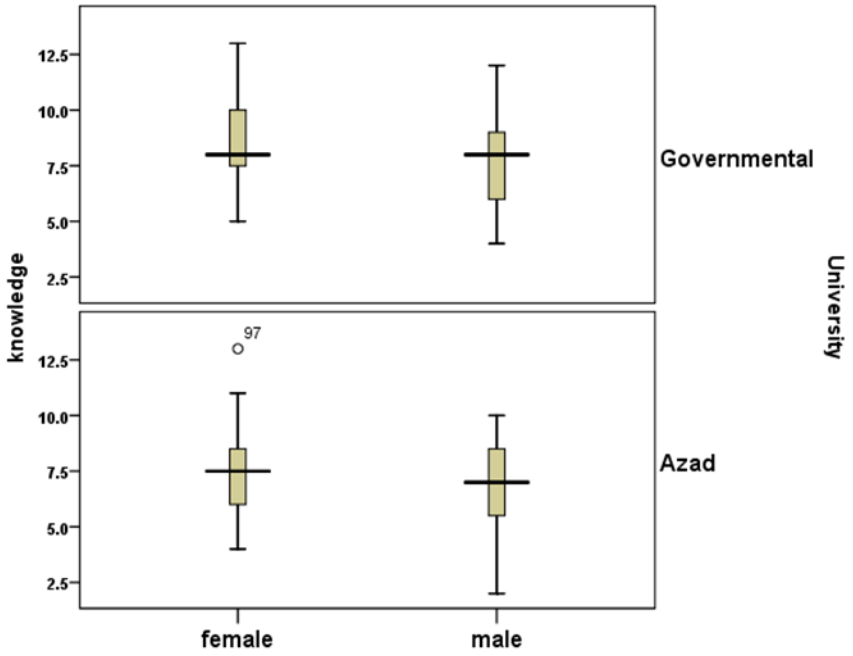

Diagram 2. Comparing the awareness score of students about the manner of management of cardiopulmonary emergencies in terms of academic semester in the two universities

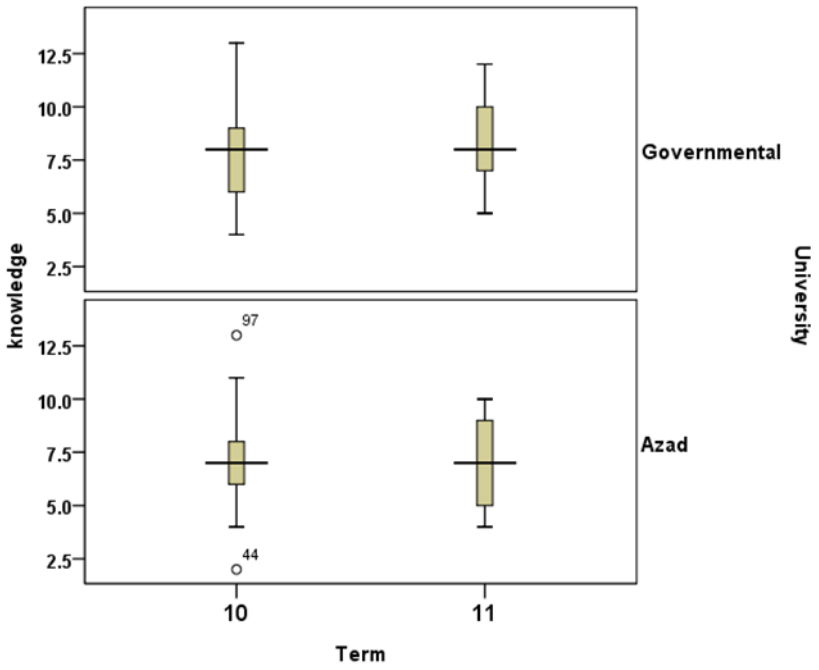

Table 3. Comparing the awareness score of students about the manner of management of cardiopulmonary emergencies in terms of gender and academic semester in the two universities

Total	Azad	Governmental		

SD	Mean	SD	Mean	SD	Mean		
2.30922	8.2414	2.44050	7.5714	2.06559	8.8667	**Female**	
2.04205	6.7931	1.97122	6.8000	2.19014	6.7857	**Male**	**10 semesters**
.014		.358		.014		P VALUE	
1.95841	7.3462	1.97929	6.9286	1.89896	7.8333	**Female**	
2.22745	7.8077	2.12132	7.0000	2.10311	8.6154	**Male**	**11 semesters**
.658		.735		.341		P VALUE	

Discussion

In the present study, the level of awareness of students about the manner of management of cardiopulmonary emergencies did not differ significantly between different universities of Tabriz city. The mean score of awareness was significantly higher in the governmental University (8.03±2.18) as compared to Azad University (7.07±2.09) out of total score of 16. Further, 61% of students in Tabriz city showed average level of awareness, 36.4% indicated poor awareness, and only 2.7% presented good level of awareness.

Part of studies inside Iran showed results concurring with the present study. In this regard, the findings of HosseiniAlmadvari et al. (2021) indicated that the level of awareness of the general dentists in Yazd city about the preliminary principles of CPR was not acceptable, and 60.4% of dentists showed poor awareness in this regard. According to these researchers, training the preliminary principles of CPR led to enhancement of awareness up to a good level by 68.8%, and thus they recommended to organize suitable educational courses with suitable intervals to enhance the knowledge and skills of dentists (16). According to the results of Baghaee et al. (2014), the students of dentistry clinic course at Urmia University of medical sciences had very poor knowledge of the principles of basic and advanced CPR. Indeed, 95% had absolutely no theoretical or practical training along their academic course in this regard. None of the subjects had any history of close observation of or participation in CPR either (17).

Part of the studies abroad also indicated poor knowledge of dentistry students about CPR. In the study by Ilyas et al. (2020), Lahuri students and dentists had proper attitude to training basic life support, but a considerable number did not have any general knowledge about CPR as well as other life supporting methods, and had never been trained about basic life support (BLS) (18). Furthermore, in the study by Ravikumar et al. (2020), although most dentistry students of Savita dentistry college enjoyed good knowledge about CPR, they did not have sufficient self-confidence for performing it, since most students lacked practice and

knowledge about CPR (19). Alkandari et al. (2017) also reported insufficient knowledge of general dentists in Kuwait about CPR.

The study by Ekici et al. (2020) suggested insufficient knowledge of general dentists of Turkey about CPR. They found that only 1.3% of dentists had experienced at least one case of cardiac arrest. Furthermore, 34.2% of the Turkish dentists showed preparation for CPR, though 73.7% had received CPR training (20).

However, the study by Alazmi et al. (2021) reported different results about the awareness of dentists in Saudi Arabia with regards to CPR. Indeed, 60% of dentists showed good awareness. One of the reasons behind the high level of awareness in that study was participation of 75% of students in CPR training courses (21).

In the present study, 30.9% of students announced preparation for CPR, and 91.8% had not received the necessary training in this regard. Furthermore, 26.3% considered organizing educational classes as essential. Announcement of readiness by dentists for CPR was greater in studies by Skopa et al. as well as Laurant et al. In these studies, 50% of the participants believed that they can perform CPR (22,23). In the study by Gupta et al. (2023), 69.9% emphasized that they have a sense of readiness and confidence for managing medical emergency conditions and performance CPR (24). It should be noted that in the present study, lack of CPR training for students had claimed a very large percentage. Meanwhile, the results of other studies indicated that dentistry students receive CPR training. Indeed, in the study by Alazmi et al. (2021), 75% of students in Saudi Arabia had been trained and considered their knowledge in this regard as sufficient (21).

This type of difference in the results of studies can be due to various methodologies. It seems that practical evaluations would be more accurate for skill determination. For example, Hussain et al. employed practical test for his analysis and all of his participants failed. Theoretical knowledge together with practical presentation and regular practice are determining factors for full CPR skills (25). Another reason behind the differences in the results of level of awareness across different studies could be the scientific knowledge and expertise of dentists. In the present study, investigation has been performed on dentistry students in their 10th and 11th semesters. However, part of studies has been performed on general practicing dentists as well as dentistry specialists.

In the present study, the level of awareness of students about the manner of management of cardiopulmonary emergencies did not show significant difference in terms of gender or academic semester. In line with this finding, Amir Chakhmaghi et al. did not find any significant difference in the awareness of dentistry male and female dentists about common medical emergencies in the office. Nevertheless, in the study of these researchers, the level of awareness diminished with increase of age (26). In the study by Hosseini-Almadvari et al. (2021), gender and working background did not have any significant impact on the level of awareness of the dentists (16).

Unlike the present study results, Alkandari et al. (2017) reported considerably higher knowledge score among female general dentists compared to male counterparts in Kuwait,

and in the study by Singh et al. in India men showed higher scores. It should be noted that CPR training considerably affects the CPR knowledge of individuals (27).

The results of studies regarding working background and clinical experiences indicated that those with more than 10 years of clinical practice had better CPR knowledge compared to less experienced individuals (28). In the present study, the reason behind lack of difference of awareness regarding academic semester has been the short time difference in 10th and 11th semesters; the short difference of these two semesters rarely makes increasing experience possible.

Without sufficient training and practice, a considerable volume of theoretical information is forgotten after 12 months, and after 18 months no sufficient practical skills would remain. Thus, dentistry specialists should continue reviving the knowledge and receive constant skill training.

According to Girdler et al., the total incidence of emergencies (except for syncope) per each dentistry is 0.7% annually (29). In this regard, and according to the results of Gupta et al., educational workshops and training for dealing with medical emergency situations in dentistry offices should be mandatory. This would help the dentist form their self-confidence in the management of such situations without any worries. Existence of suitable equipment and infrastructures in dentistry clinics is recommended in order to facilitate management of this situation (24).

Conclusion: Based on the results obtained in this research, it should be guaranteed that training medical emergencies in future would target the deficits of dentistry students in BLS.

The present study had some limitations including small sample size which may limit the generalizability of results. Further, lack of assessing the practical knowledge of students is another limitation; assessment of solely the theoretical knowledge is not sufficient to ensure CPR qualifications. Acknowledgments:

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Conflict of Interest: no conflict of interest

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