Sultan Qaboos University Med J, November 2018, Vol. 18, Iss. 4, pp. e507–512, Epub. 28 Mar 19
Submitted 1 May 18
Revision Req. 6 Jun 18; Revision Recd. 4 Jul 18
Accepted 5 Aug 18
doi: 10.18295/squmj.2018.18.04.013

CLINICAL & BASIC RESEARCH

Knowledge and Attitudes Towards First Aid Measures Among Medical Students at Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

*Abdulrahman Alshuwayrikh,[1] Abdulrahman Aljethaily,[1] Faris Alosaimi,[1] Osama Alshaya,[1] Abdullah Alasmari,[1] Mohammed Al-Makhdob,[1] Saleh Alkhonezan,[1] Salahuddin Khan[2]

حجم معرفة وتوجهات طلاب الطب في جامعة الإمام محمد بن سعود الإسلامية نحو الإسعافات الأولية، الرياض، المملكة العربية السعودية

عبدالرحمن الشويرخ، عبدالرحمن الجذيلي، فارس العصيمي، أسامة الشايع، عبدالله الأسمري، محمد المخضوب، صالح الخنيزان، صلاح الدين خان

ABSTRACT: ***Objectives:*** This study aimed to evaluate knowledge and attitudes towards first aid (FA) measures among medical students at the Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia. ***Methods:*** This cross-sectional study was conducted between September and December 2016 among 600 medical students in different academic years at Al-Imam Mohammad Ibn Saud Islamic University. Knowledge and attitudes towards FA measures were evaluated using a modified version of a previously validated questionnaire. Data were compared between students with previous FA training and those without previous FA training. ***Results:*** A total of 259 medical students were included (response rate: 43%). Of these, 43% had previously received FA training and 63% had witnessed an emergency first-hand. Mean theoretical (5.93 ± 2.50 versus 4.49 ± 2.08; P <0.001) and practical (4.29 ± 2.62 versus 2.90 ± 2.17; P <0.001) knowledge scores were significantly higher among students with previous FA training compared to those without training; however, there was no significant difference in mean attitude score (5.60 ± 1.66 versus 5.39 ± 1.66; P = 0.329). ***Conclusion:*** The medical students, particularly those without previous FA training, demonstrated weak levels of FA knowledge. Such findings necessitate the inclusion of FA training in medical curricula in Saudi Arabia.

Keywords: First Aid; Emergency Treatment; Medical Education; Knowledge; Attitudes; Saudi Arabia.

الملخص: الهدف: تهدف الدراسة لتقييم معرفة وتوجهات الإسعافات الأولية بين طلاب الطب في جامعة الإمام محمد بن سعود الإسلامية، الرياض، المملكة العربية السعودية. **الطريقة:** هذه دراسة مقطعية أجريت بين 600 طالب طب من مختلف السنوات في جامعة الإمام محمد بن سعود الإسلامية من سبتمبر إلى ديسمبر من عام 2016. تم تقييم حجم معرفة وتوجهات عينة من طلاب الطب نحو الإسعافات الأولية باستخدام استبيان تم التحقق منه مسبقا مع إضافة بعض الأسئلة. تمت مقارنة البيانات بين الطلاب الذين تدربوا في الإسعافات الأولية والطلاب الذين لم يتدربوا مسبقا. **النتائج:** تم دراسة ما مجموعه 259 طالب طب (معدل الإجابة: 43%). 43% من الطلاب لديهم تدريب مسبق للإسعافات الأولية و 63% شاهدوا حالة طارئة تستدعي عمل الإسعافات الأولية. متوسط المعرفة النظرية (2.50 ± 5.93 مقابل 2.08 ± 4.49؛ P <0.001) والمعرفة التطبيقية (2.62 ± 4.29 مقابل 2.17 ± 2.90؛ P <0.001) كان أعلى بشكل واضح لدى الطلاب الذين تدربوا مسبقا على الإسعافات الأولية مقارنة بالطلاب الذين لم يكن لديهم تدريب مسبق. على النقيض لا يوجد اختلاف كبير بين الطلاب المتدربين وغير المتدربين في توجهاتهم نحو الإسعافات الأولية (1.66 ± 5.60 مقابل 1.66 ± 5.39؛ P = 0.329). **الخلاصة:** هناك ضعف لدى طلاب الطب الذين تمت دراستهم في معرفة الإسعافات الأولية. مما يدل على ضرورة إدخال مادة الإسعافات الأولية في المناهج الطبية.

الكلمات المفتاحية: الإسعافات الأولية؛ معاجة طارئة؛ التعليم الطبي؛ التوجهات؛ الممارسات؛ المملكة السعودية.

Advances in Knowledge

- *The current study found that medical students had low levels of knowledge of first aid (FA) measures, even among those who had previously received FA training.*
- *However, there were significantly higher levels of FA knowledge among medical students who had previously received FA training; this finding supports the inclusion of FA training within the medical curriculum.*

Application to Patient Care

- *Proper FA interventions can reduce patient mortality and morbidity. Enhancing FA knowledge among medical students would enable such students to more competently handle emergency situations, thus indirectly affecting medical care.*

[2]*Department of Biochemistry,* [1]*College of Medicine, Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia*
**Corresponding Author's e-mail: aaalshuwayrikh@gmail.com*

First aid (FA) is defined as the initial care applied after an injury or acute illness.[1] The goal of FA is to preserve life and prevent the patient's condition from deteriorating until professional healthcare becomes available.[2] Any person can begin FA measures in an emergency situation with minimal or no medical equipment needed.[1] In particular, healthcare providers have a duty to initiate FA measures in such situations in order to reduce patient suffering and the risk of disability and early death, especially as bystanders often expect such individuals to take appropriate action.[2–4] Thus, it is critical that medical students are properly educated in FA and basic life support (BLS) measures, particularly during the early phases of their studies.[3] It is recommended that FA training courses be included in the curricula of medical schools and colleges.[2–4]

Unfortunately, FA training is often neglected in medical curricula.[2,5] Several studies have reported disappointing results regarding levels of FA readiness among medical students and trainees.[2,3,5,6] Tan *et al.* found that more than 70% of junior doctors lacked FA knowledge and practice.[2] In a study from the Netherlands, only 38% of participants met required guidelines regarding FA and BLS knowledge.[3] A study from India found that only 13.8% of medical students had good knowledge of FA.[5] A previous Saudi Arabian study showed that medical students had poor familiarity with BLS, particularly cardiopulmonary resuscitation (CPR), with 67.36% scoring <50%.[6] In the United Arab Emirates, Das *et al.* reported that a FA training programme for first-year medical students enhanced BLS and FA knowledge and practical skills.[7] Similarly, a Turkish study showed the efficacy of such programmes, with FA and BLS training rendering medical students capable of themselves training other students.[8]

To the best of the authors' knowledge, no study has yet been published comparing knowledge levels and attitudes between medical students with and without prior FA training in Saudi Arabia. The current study aimed to assess knowledge and attitudes towards FA among medical students at the Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia, particularly with respect to how previous FA training influences students' knowledge and attitudes towards FA. Currently, a BLS certificate is required for clinical year students in the College of Medicine at Al-Imam Mohammad Ibn Saud Islamic University. This certificate is acquired through a one-day course that is provided by external entities, with the course focusing mainly on CPR.

Methods

This cross-sectional study was conducted at the College of Medicine of the Al-Imam Mohammad Ibn Saud Islamic University from September to December 2016. A convenience sample of preclinical (from preparatory until third year) and clinical (fourth year and above) medical students was recruited. The required sample size was calculated to be 234 out of a total of 600 potential participants, assuming that the knowledge and attitudes towards FA among medical students would be 50%, with a 95% confidence interval and a margin of error of 5%.

A modified version of a previously validated questionnaire was used to assess FA knowledge and attitudes.[8] The final English-language questionnaire comprised 41 items, including questions about demographic characteristics (nine items), theoretical FA knowledge (11 items), practical FA knowledge (10 items) and attitudes towards FA (11 items). The questionnaire assessed various emergency situations and FA approaches, including CPR, bleeding, burns and bone fractures. The theoretical knowledge section consisted of direct questions, while the practical knowledge items were case-based. Most of the questions were reproduced with permission from Khan *et al.*[8] However, some new questions were added based on a review of the literature.[9] Most of the questions were closed-ended multiple choice questions with 3–4 distractors, with some yes/no questions. All of the questions had only one correct answer. The entire questionnaire took between 10–20 minutes to complete.

The modified questionnaire was piloted in a group of 52 random students from various academic years. Based on the findings of the pilot study, the questions were edited for clarity and the final version of the questionnaire was validated. Subsequently, the final questionnaire was distributed to 600 medical students in all academic years in the College of Medicine. Both electronic and paper versions of the questionnaire were disseminated to enhance the response rate. The paper version was distributed to all students who were physically in attendance at the College of Medicine at the time of distribution.

An Excel spreadsheet, Version 2016 (Microsoft, Redmond, Washington, USA) was used for data entry and the Statistical Package for the Social Sciences (SPSS), Version 19.0 (IBM Corp., Armonk, New York, USA) was used for statistical analysis. Data entry was verified by two researchers to ensure consistency and accuracy. A Chi-squared test was used to determine associations between sociodemographic variables and

Table 1: Emergencies witnessed by medical students at Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia (N = 259)

Type of emergency witnessed	n (%)*		
	Total	Students with prior FA training (n = 112)	Students without prior FA training (n = 147)
None	96 (37)	43 (38)	53 (36)
Burns	76 (29)	32 (29)	44 (30)
Fractures/ dislocations	65 (25)	34 (30)	31 (21)
Choking	50 (19)	27 (24)	23 (16)
Drowning	34 (13)	16 (14)	18 (12)
Heart attack	18 (7)	12 (11)	6 (4)
Seizure	16 (6)	9 (8)	7 (5)
Heat stroke	10 (4)	7 (6)	3 (2)

FA = first aid.

**Percentages do not add up to 100% as the students could select more than one option.*

knowledge and attitude scores. A student's t-test was utilised to determine significant differences in mean knowledge and attitude scores between students with and without prior FA training. A *P* value of <0.050 was deemed statistically significant.

This study received ethical approval from the Ethical Committee of the College of Medicine at Al-Imam Mohammad Ibn Saud Islamic University (#0010 7/03/2016-12). Informed consent was granted by all students who completed the electronic version of the questionnaire during completion of the online form. Those who filled in the paper version of the questionnaire gave verbal consent in addition to signed written consent.

Results

A total of 259 medical students participated in the study (response rate: 43%). Of these, 83 (32%) completed the electronic version and 176 (68%) completed the paper version of the questionnaire. Most participants (79%) were in their pre-clinical years and only 21% were in their

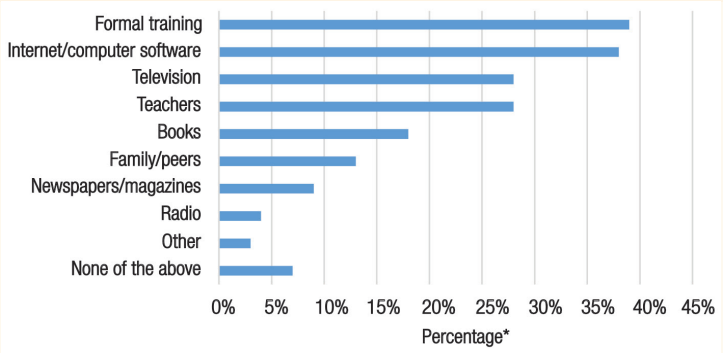

Figure 1: Sources of first aid knowledge among medical students at Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia (N = 259).

**Percentages do not add up to 100% as the students could select more than one option.*

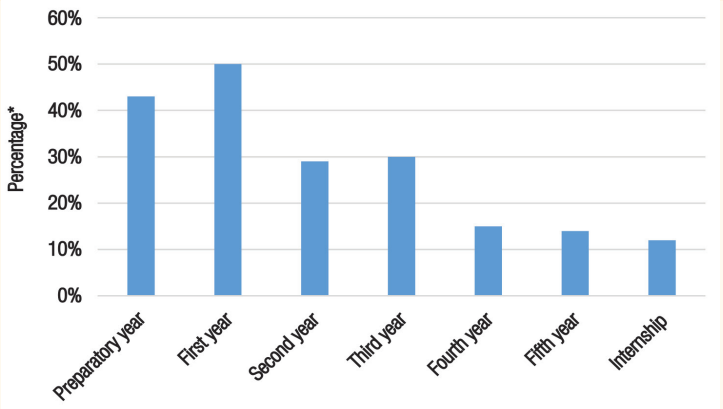

Figure 2: Opinions on the most appropriate time to include first aid training in the medical curriculum among medical students at Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia (N = 259).

**Percentages do not add up to 100% as the students could select more than one option.*

Table 2: Mean first aid-related knowledge and attitudes scores among medical students at Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia (N = 259)

Variable	Mean score ± SD			*P* value*
	Total	Students with prior FA training (n = 112)	Students without prior FA training (n = 147)	
Theoretical knowledge	5.10 ± 2.36	5.93 ± 2.50	4.49 ± 2.08	<0.001
Practical knowledge	3.51 ± 2.47	4.29 ± 2.62	2.90 ± 2.17	<0.001
Attitude	5.47 ± 1.66	5.60 ± 1.66	5.39 ± 1.66	0.329
Total	14.08 ± 5.28	15.81 ± 5.64	12.78 ± 4.63	<0.001

SD = standard deviation; FA = first aid.
**Using a student's t-test.*

clinical years. A total of 112 (43%) students had had previous FA training, while the remaining 147 (57%) had not. The most frequently witnessed emergencies were burns (29%), fractures/dislocations (25%) and choking (19%). Those with prior FA training had less frequently witnessed emergencies compared to those without training (62% versus 64%) [Table 1]. Students had acquired FA-related knowledge from various sources, the most common being formal training (39%), the Internet/computer software (38%), television (28%) and teachers (28%) [Figure 1]. Most of the students (43–50%) believed that FA training and education should be incorporated into the curriculum during the first two years of their degree programme [Figure 2].

Overall, the mean attitude score was higher than the theoretical and practical knowledge scores (5.47 ± 1.66 versus 5.10 ± 2.36 and 3.51 ± 2.47, respectively). The overall mean combined knowledge and attitude score was significantly associated with prior FA training (15.81 ± 5.64 versus 12.78 ± 4.63; *P* <0.001). In addition, the mean scores for both theoretical (5.93 ± 2.50 versus 4.49 ± 2.08; *P* <0.001) and practical (4.29 ± 2.62 versus 2.90 ± 2.17; *P* <0.001) knowledge questions were significantly higher among students with prior FA training compared to those without. However, there was no significant difference in mean attitude scores between the two groups (5.60 ± 1.66 versus 5.39 ± 1.66; *P* = 0.329) [Table 2].

The frequency of correct or positive responses to knowledge and attitude items is shown in Table 3. In terms of theoretical knowledge, the rate of correct responses ranged from 34–86%. Less than half of the students (34%) knew the correct ratio of chest compressions to rescue breaths when performing CPR on an adult patient. There was a significant difference in the frequency of correct responses to this item among FA-trained and untrained

Table 3: Correct/positive responses to first aid-related knowledge and attitude questionnaire items among medical students at Al-Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia (N = 259)

Item	Correct/positive responses, n (%)			*P* value*
	Total	Students with FA training (n = 112)	Students without FA training (n = 147)	
Theoretical knowledge				
What does CPR stand for?	194 (75)	90 (80)	104 (71)	0.105
Which of the following is the correct ratio of chest compressions to rescue breaths when performing CPR on an adult?	87 (34)	70 (63)	17 (12)	<0.001
What is the proper definition of an open fracture?	126 (49)	68 (61)	58 (39)	0.001
Why should you act quickly for a casualty with severe bleeding?	129 (50)	66 (59)	63 (43)	0.015
Does FA require expensive equipment?	224 (86)	94 (84)	130 (88)	0.386
Practical knowledge				
What would be your first step if you encountered a person with profuse leg bleeding due to a gunshot wound?	139 (54)	60 (54)	79 (54)	>0.999
What would you do first for a person who has burnt his hand with coffee? The affected area is 2–3 inches in size and is red, swollen and painful.	113 (44)	49 (44)	64 (44)	>0.999
Which of the following would you do if a woman's dress sleeve were to catch fire and adhere to her burnt skin?	32 (12)	16 (14)	16 (11)	0.526
What would you encourage your colleague to do if he were to become distressed by a piece of food lodged in his airway?	109 (42)	51 (46)	58 (39)	0.393
What should you do to a person who has fallen down with a suspected thigh fracture?	86 (33)	55 (49)	31 (21)	<0.001
Attitude				
If you have good knowledge of FA, you should not hesitate to use it when needed.	195 (75)	90 (80)	105 (71)	0.299
Do you support including FA in the medical college curriculum?	220 (85)	94 (84)	126 (86)	0.501
Would you like to give a basic idea of FA techniques to your fellow students?	189 (73)	81 (72)	108 (73)	0.730
Do you think FA decreases the burden of hospitals?	177 (68)	82 (73)	95 (65)	0.258
Do you think FA increases patients' survival rates?	259 (100)	112 (100)	147 (100)	>0.999

*FA = first aid; CPR = cardiopulmonary resuscitation. *Using a Chi-squared test.*

students (63% versus 12%; P <0.001). In contrast, there were no significant differences between FA-trained and untrained students in terms of awareness of the meaning of the abbreviation 'CPR' (80% versus 71%; P = 0.105) and whether FA requires expensive equipment (84% versus 88%; P = 0.386).

In general, there was a low level of practical knowledge among the cohort, with the rate of correct responses ranging from 12–54%. Over half (54%) of the students knew what to do when encountering a bleeding gunshot victim, but only 12% knew how to handle a patient with burning cloth attached to skin. Only one practical knowledge question—which involved dealing with a thigh fracture—displayed a significant difference between students with prior FA training and those without (49% versus 21%; P <0.001).

With regards to attitudes, the rate of positive responses ranged from 68–100%. All of the participants believed that FA increases survival rates and most students (85%) supported the inclusion of FA training into the medical curriculum. There were no significant differences in the rate of positive responses between FA-trained and untrained students for any of the attitude items (P >0.050 each).

Discussion

In the current study, medical students at the Al-Imam Mohammad Ibn Saud Islamic University were found to have poor levels of FA knowledge, especially in terms of the practical aspects of FA. The inclusion of FA training in the medical curriculum could improve this deficiency.[7,8] Additionally, the study observed a significant difference in knowledge between students with and those without prior FA training; this finding highlights the importance of including FA in medical education. However, no significant differences were noted in attitude between FA-trained and untrained students. This could imply that willingness to act in emergencies is not enhanced by FA training. On the other hand, the lack of difference between the groups may reflect a lack of confidence among previously trained students. In particular, students untrained in FA showed significant weaknesses regarding their knowledge of diverse emergency situations, indicating that FA training should focus on different types of emergencies (e.g. fractures, burns and bleeding).

The rates of correct responses to certain FA knowledge questions in the current study varied from those reported in other studies. The proportion of students in the present study who knew the correct CPR compression-to-breath ratio was lower than that reported in a previous study conducted in Saudi Arabia (34% versus 53%).[6] In a study from Pakistan, Abbas *et al*. found that 52% and 37.6% of students with and without FA training, respectively, knew how to deal with a bleeding person; in comparison, this percentage was 54% in both groups in the present study.[10] The question regarding management of a choking victim was answered correctly by 42% of the students in the current cohort; this is similar to that noted in Abbas *et al*.'s study (45.6% and 41.6% for trained and untrained students, respectively), yet lower than that reported by Mejia *et al*. in Peru (53.4%).[10,11] Only 33% of the participants in the present study knew how to deal correctly with a bone fracture. This is higher than that reported by Joseph *et al*. in South India (12.5%), yet lower than that observed in Khan *et al*.'s study in Pakistan (44.5%).[4,5] Support for the inclusion of FA training was high among current students (85%); Khan *et al*. reported similar findings (94.4%).[4]

The present study was limited by the low number of participants in their clinical years. This was likely because most clinical students were undertaking their clinical rotations outside of the college during the distribution of the survey. In addition, the students who completed the online questionnaire had more time and space to complete it than those who completed the paper version. Finally, the findings of the present study were based on data from a single cohort of one medical college in Riyadh; as such, the results cannot be generalised to all medical colleges in Riyadh or to other regions of Saudi Arabia. Larger randomised trials involving multiple cohorts are recommended to provide a higher level of evidence.

Conclusion

This study found that the overall level of FA knowledge among medical students attending the Al-Imam Mohammad Ibn Saud Islamic University was low, predominantly in terms of practical questions. There was a significant difference in knowledge between students with prior FA training and those without, although there was no difference in attitudes between the two groups. These findings support the inclusion of FA in the formal medical college curriculum, particularly in the early stages of medical education.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

FUNDING

No funding was received for this study.

References

1. Singletary EM, Zideman DA, De Buck ED, Chang WT, Jensen JL, Swain JM, et al. Part 9: First aid - 2015 International Consensus on First Aid Science with Treatment Recommendations. Circulation 2015; 132:S269–311. https://doi.org/10.1161/CIR.0000000000000278.
2. Tan EC, Severien I, Metz JC, Berden HJ, Biert J. First aid and basic life support of junior doctors: A prospective study in Nijmegen, the Netherlands. Med Teach 2006; 28:189–92. https://doi.org/10.1080/01421590500312847.
3. Tan EC, Hekkert KD, van Vugt AB, Biert J. First aid and basic life support: A questionnaire survey of medical schools in the Netherlands. Teach Learn Med 2010; 22:112–15. https://doi.org/10.1080/10401331003656538.
4. Khan A, Shaikh S, Shuaib F, Sattar A, Samani SA, Shabbir Q, et al. Knowledge attitude and practices of undergraduate students regarding first aid measures. J Pak Med Assoc 2010; 60:68–72.
5. Joseph N, Kumar G, Babu Y, Nelliyanil M, Bhaskaran U. Knowledge of first aid skills among students of a medical college in Mangalore City of South India. Ann Med Health Sci Res 2014; 4:162–6. https://doi.org/10.4103/2141-9248.129022.
6. Alanazi A, Alsalmeh M, Alsomali O, Almurshdi AM, Alabdali A, Al-Sulami M, et al. Poor basic life support awareness among medical and College of Applied Medical Sciences students necessitates the need for improvement in standards of BLS training and assessment for future health care providers. Middle East J Sci Res 2014; 21:848–54. https://doi.org/10.5829/idosi.mejsr.2014.21.05.82335.
7. Das M, Elzubeir M. First aid and basic life support skills training early in the medical curriculum: Curriculum issues, outcomes, and confidence of students. Teach Learn Med 2001; 13:240–6. https://doi.org/10.1207/S15328015TLM1304_05.
8. Altintaş KH, Aslan D, Yildiz AN, Subaşi N, Elçin M, Odabaşi O, et al. The evaluation of first aid and basic life support training for the first year university students. Tohoku J Exp Med 2005; 205:157–69. https://doi.org/10.1620/tjem.205.157.
9. Tsegaye W, Tesfaye M, Alemu M. Knowledge, attitude and practice of cardiopulmonary resuscitation and associated factors in Ethiopian university medical students. J Gen Pract 2015; 3:206. https://doi.org/10.4172/2329-9126.1000206.
10. Abbas A, Bukhari SI, Ahmad F. Knowledge of first aid and basic life support amongst medical students: A comparison between trained and un-trained students. J Pak Med Assoc 2011; 61:613–16.
11. Mejia CR, Quezada-Osoria C, Moras-Ventocilla C, Quinto-Porras K, Ascencios-Oyarce C. [Level of knowledge in medical emergencies among medical students of Peruvian universities]. Rev Peru Med Exp Salud Publica 2011; 28:202–9.