International Journal of Community Medicine and Public Health
Fatani AA et al. Int J Community Med Public Health. 2019 Jun;6(6):2372-2377
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20192227

Original Research Article

Basic life support knowledge of family medicine residents at joint program of family medicine in Jeddah Saudi Arabia, 2017

Ammar A. Fatani*, Nayef Al Johani, Adel M. Ibrahim

Department of Family Medicine, Joint Program of Family Medicine, Jeddah, Saudi Arabia

Received: 02 May 2019
Revised: 16 May 2019
Accepted: 17 May 2019

***Correspondence:**
Dr. Ammar A. Fatani,
E-mail: ammarfatani@hotmail.com

ABSTRACT

Background: Healthcare professionals are expected to have adequate knowledge of basic and advanced cardiac life support to revive unresponsive patients. Little is known about that in health care professionals in Saudi Arabia.
Methods: we conducted this study in the joint program of family medicine to evaluate knowledge of physicians about basic life support, and to identify factors associated with the differences in their knowledge. Through a cross-sectional analytic study, all physicians in the Joint Program of Family Medicine in Jeddah were included in the study. For collection of data, a validated self-administered questionnaire was used.
Results: Out of responding physicians (n=150), females constituted 117 (78%), their mean age accounted for 27.3±2.2 years. all physicians (99.3%) reported that they had attended BLS courses before. Out of a maximum of "13", the mean score of correct answers accounted for 6.2±1.6, only 18.7% of the physicians achieved above average scores. Only qualification had statistically significant impact on the level of knowledge, the average score percentage was higher among those who have MBBS qualification only compared to their colleagues who have postgraduate degrees (48.3%±11.57% vs 39.2%±13.78%) $p<0.05$.
Conclusions: Physicians in the Joint Program of Family Medicine have deficient level of knowledge about BLS, despite of their previous BLS training. Frequent training is strongly recommended to sustain adequate level of knowledge about BLS.

Keywords: Basic life support, Knowledge, Physicians

INTRODUCTION

Cardiac arrests and accidents are the most common type of emergencies with serious consequences, the cardiac arrest alone is responsible for 15% of the global mortality, it had been estimated that the incidence of cardiopulmonary arrest is 20–140 per 100,000 people, with an alarmingly high mortality rates reaching up to 90-98%.[1,2] The great majority of cases of cardiac arrest occurs in an out-of-hospital places where there is no adequate resuscitation by health care professionals within the critical time. After cardiac arrest the chance of successful resuscitation decreases by 7-10% every one-minute delay in starting resuscitation. Therefore, early recognition, evaluation and performance of cardiopulmonary resuscitation (CPR) with immediate access to emergency medical services (EMS) are critical determinants of survival rate of cardiac-arrest, and early delivery of a shock with a defibrillator (CPR, plus defibrillation) within 3–5 minutes of collapse can result in survival rate of 49–75%.[3,4] The emergency intervention for management of cardiac arrest involves a series of simple maneuvers, which are collectively known as basic life support (BLS). These maneuvers include "recognizing the signs of sudden cardiac arrest, heart attack, stroke and foreign-body airway obstruction,

cardiopulmonary resuscitation (CPR), and defibrillation with an automated external defibrillator", these maneuvers can double or triple the chances of survival.[5] It is important that those who may be present at the scene of a cardiac arrest, have adequate level of knowledge and skills about appropriate resuscitation and the ability to apply it into practice.[6] Knowledge of basic life support and practice of simple CPR increase the chances of survival of the patient until experienced medical help are available.[7] In this regards, physicians should be able to handle the responsibility, making prompt decision and performing. Therefore, knowledge and training in resuscitation are of the utmost importance for professionals working in medical services.[8] In Saudi Arabia, ischemic heart diseases are ranked as the second leading cause of death, the available data on the overall prevalence of cardiovascular diseases (CVD) in Saudi Arabia is limited but some studies have estimated that "the prevalence of coronary heart disease is around 5.5% and hypertension prevalence is around 25.5%", and the overall mortality rate resulting from CVD accounts for 42% of the total mortality.[9,10] CPR and AED training are mandatory for all healthcare providers for renewal of license as stipulated by the Saudi Commission for Health Specialties.[11] Although several studies have been conducted to evaluate knowledge and practice of BLS among public, very little is known about it in physicians.[12,13] Therefore, and provided that family physicians are opt to work in primary health care centers of hospitals, our study aim at exploring the level of knowledge of Saudi Board candidate physicians about BLS, in an attempt to bridge the gap of our knowledge about this subject.

METHODS

Study design

was a cross-sectional analytic study, selection criteria all family medicine residents' males and females from (level 1 to level 4) in the Joint Program of Family Medicine in Jeddah Saudi Arabia were included in the study during the research period from December 2017 to January 2018, sample size were included in this study (n=150).

Research instrument and procedure

The researcher visited the target population during research field period and contacted the leader of each level of residency to plan an appropriate time for questionnaire distribution. The questionnaire was recollected the same day.

For collection of data, we used a self-administered questionnaire which consisted of demographic characteristics of the participants, in addition to questions reflecting their knowledge about basic life support, which is based on the European Resuscitation Council Guidelines for Resuscitation in 2005: Section 2. Adult basic life support and use of automated external defibrillators, and it had been adopted for similar study assessing the knowledge of medical and paramedical personnel about BLS.[14,15]

Ethical considerations

An approval was collected from the regional Institutional Research Board (IRB) of Health Affairs and director of family medicine program in Jeddah.

Data interpretation and statistical analysis

Data entry and statistical analysis was done by using the statistical products and services solution program (SPSS) version 21. Quantitative normally distributed variables were presented as means and standard deviation (SD), and qualitative variables were expressed as frequency and percentages. T-test and ANOVA were used to explore statistical significance in differences of the level of knowledge between two groups and more than two groups respectively. Pearson correlation was carried out to find significance in the association between quantitative variables. $P<0.05$ was considered as an indication for statistical significance.

RESULTS

Out of all responding physicians (n=150), females constituted 117 (78%), their mean age accounted for 27.3±2.2 years, it ranged between 24-33 years, most of them were singles (58.2%) and 37% were married. The overwhelming majority (93%) had MBBS qualification only, while the rest (7%) had postgraduate degrees. They practiced for an average of 1.5±1.3 years after graduation either in hospitals (44.8%) or primary health care centers (40.2) (Table 1). Regarding attendance of training courses about BLS, all physicians except one (99.3%) reported that they had attended courses before, mainly in specialized centers (47.1%) and hospitals (48%) (Figure 1). While almost all physicians (97.3%) knew the correct definition of the abbreviation "BLS" and the majority of them (79.3%) knew the abbreviation "EMS", a remarkably lower percentage (22%) knew the correct definition of "AED". Almost two thirds of the physicians knew how to behave when finding someone unresponsive in the middle of the road while being alone (66.7%), the location for chest compression in adults (64%) and depth of compression in adults during CPR (65.3%). Otherwise, lower percentages of the physicians could know what to do after confirming non response of somebody after shaking and shouting at him (56.7%), how to give rescue breathing in infants (45.3%) and location of chest compression in infants (44%). Moreover, the least percentages of correct answers were recorded for their knowledge about the depth of compression during CPR in children (19.3%) and neonates (6.7%). Out of a maximum of "13", the overall mean score of correct answers achieved by the physicians accounted for 6.2±1.6, corresponding to 47.7%±11.9%, it ranged between 3-10 correct answers (Table 2). Further, the

percentages of correct answers were categorized according to a cut off level of 60% into either above average (≥60% of correct answers) or below average (<60%). Figure 2 demonstrates that only 18.7% of the physicians could achieve above average scores.

Table 1: Characteristics of the physicians (n=150).

Characteristics	No.	Percentage (%)
Gender		
Male	33	22.0
Female	117	78.0
Age		
Mean±SD	27.3±2.2 years	
Marital status (n=146)		
Single	85	58.2
Married	54	37.0
Widowed	5	3.4
Divorced	2	1.4
Qualifications		
MBBS	132	93.0
Diploma	4	2.8
Master	1	.7
Board	5	3.5
Years of practice		
Mean±SD	1.5±1.3 years	
Place of previous practice (n=87)		
Hospitals	39	44.8
PHC	35	40.2
Others	13	15.0

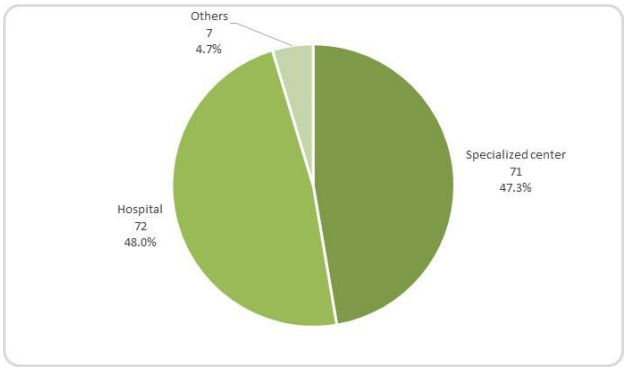

Figure 1: Places for training about basic life support.

To demonstrate factors associated with the differences in the level of knowledge of the physicians about BLS, Table 3 shows that only qualification which had statistically significant impact, where the average score percentage was significantly higher among those who have MBBS qualification only compared to their colleagues who have postgraduate degrees (48.3%± 11.57% vs 39.2%±13.78%) p<0.05. Otherwise, although the average score percentage was higher among single physicians (49.0±11.31), those who had previous practice in hospitals (48.5±12.37) and had training in BLS also in hospitals (49.8±12.05), these differences are not statistically significant p>0.05. On the same context, although a positive correlation was observed between years of practice and level of knowledge (Figure 3), and inverse correlation with the duration since attaining training about BLS (Figure 4), these observed associations are not statistically significant p>0.05.

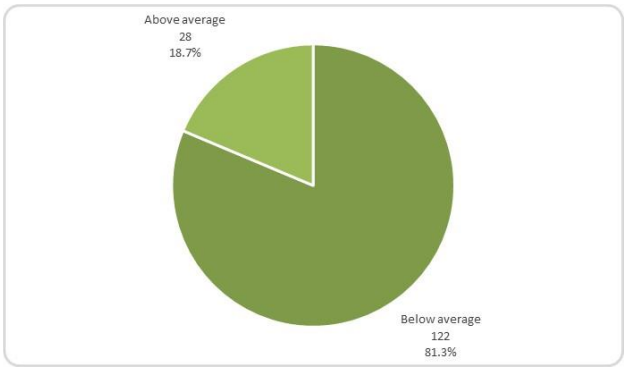

Figure 2: Level of knowledge about basic life support.

Table 2: Response of the physicians to the questions reflecting their knowledge about BLS.

Questions	No. of correct answers	%
What is the abbreviation of "BLS"?	146	97.3
When you find someone unresponsive in the middle of the road, what will be your first response? (Note: You are alone there)	100	66.7
If you confirm somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?	85	56.7
What is the location for chest compression in adults?	96	64.0
What is the location for chest compression in infants?	66	44.0
How do you give rescue breathing in infants?	68	45.3
Depth of compression in adults during CPR	98	65.3
Depth of compression in children during CPR	29	19.3
Depth of compression in neonates during CPR	10	6.7
Rate of chest compression in adult and Children during CPR	42	28.0
What does abbreviation AED stand for?	33	22.0
What does abbreviation EMS stand for?	119	79.3
If you and your friend are having food in a canteen and suddenly your friend starts expressing symptoms of choking but responsive, what will be your first response?	38	25.3

Table 3: Level of knowledge of the physicians according to their characteristics.

Characteristics	Mean±SD	P value
Gender		
Male	47.8±12.72	0.960
Female	47.7±11.75	
Marital status		
Single	49.0±11.31	0.147
Married	46.6±12.27	
Divorced/widowed	40.7±15.84	
Qualifications		
MBBS only	48.3±11.57	0.020
Postgraduate	39.2±13.78	
Place of previous practice		
Hospitals	48.5±12.37	0.844
PHC	47.0±12.62	
Others	46.7±12.74	
Place of training in BLS		
Specialized center	45.8±12.14	0.157
Hospital	49.8±12.05	
Others	47.4±10.22	

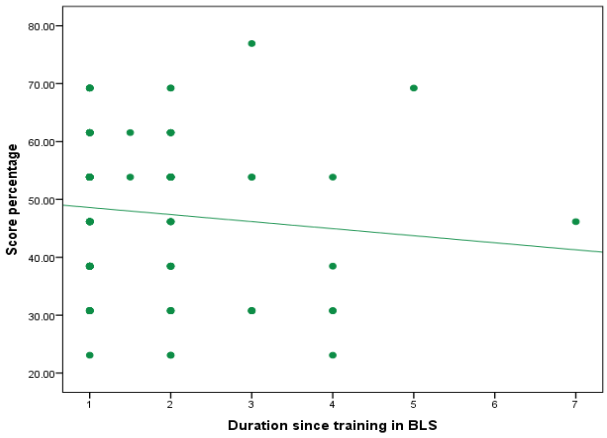

Figure 1: Correlation between duration since training in BLS and knowledge score percentage.

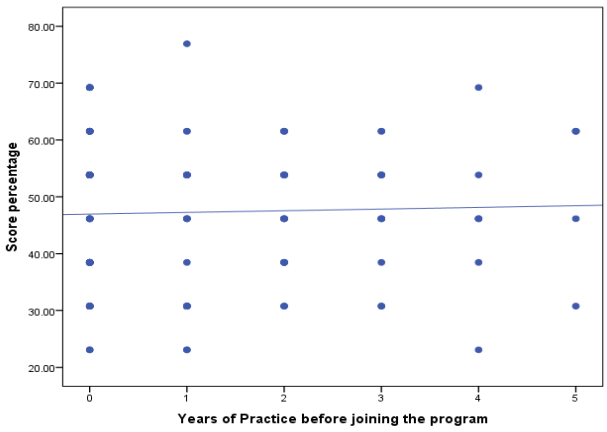

Figure 2: Correlation between years of practice and knowledge score percentage.

DISCUSSION

Along the past few decades there has been a growing concern about the significant burden of cardiovascular diseases, in terms of morbidity and sudden cardiac arrest. Together with other causes of cardiac arrest such as suffocation, near-drowning, electrocution injuries, or any other hazards, basic life support (BLS) and cardiopulmonary resuscitation (CPR) became crucial for saving lives.[16] Effective CPR and survival of the cases depend on immediate intervention based on adequate knowledge and practical skills for resuscitation.[2,8,17] Our findings revealed that our physicians in the postgraduate family board had poor theoretical knowledge about basic life support, only 18.7% of them could achieve above average scores. Similar results were reported in various settings, for example among physicians in a university hospital in Jamaica, newly qualified physicians in general hospitals in New Zealand, physicians in nursing college in India, residents in a university hospital in Turkey, and physicians working on-call duties in Finland.[18-22] The poor level of knowledge of our physicians comes despite of previous training in BLS; as training in BLS is a conditional prerequisite for renewal of license of physicians in Saudi Arabia, as stipulated by the Saudi Commissions for Health Specialties.[11] This controversy was observed also in other studies, where the level of knowledge was not related to remote training on BLS, for several reasons.[18,19,21] One of the reasons was reported by Howell et al is the attrition of knowledge among trainees after two years of training.[18] In this regards, Yang and his colleagues, through a systematic review of researches about retention of BLS knowledge, found that the knowledge or skills deteriorate over time ranging between 6 weeks to 2 years after training.[23] In the same line, our results showed inverse correlation between the level of knowledge and the duration since attaining training about BLS, despite of being statistically not significant, but it still of practical importance, and support the assumption of Yang et al, they stated that "the current recommendation of a two year interval appears to be very elongated as health care professionals' are unable to retain the knowledge of the skill within this timeframe" Therefore, they strongly recommend that "that healthcare professionals' need to have shorter intervals between CPR training in an attempt to enhance the retention of CPR knowledge and skill in order to place them in a better position when performing CPR at a cardiac arrest".[23] Another reason reported by Aranzábal-Alegria et al who claimed that attitude and concern of the physicians about the subject under training is influenced by their insight about the future need of its utilization in their practice, this assumption explain partly the attrition of knowledge among our physicians, as they are expecting that their future practice will very rarely include critical life threating situations in the primary health care setting.[2] Besides, among one of the problems that needs to be solved, as stated by Lo et al is the methodology used during the training, they asserted that training in BLS and ALS should be executed by using

experience-based learning, and advocated combined use of theoretical-practical training and new technologies on CPR formation.[24]

The least percentages of correct answers recorded by our physicians were their knowledge about the depth of compression during CPR in children (19.3%) and neonates (6.7%). According to the American Heart Association Guidelines for cardiopulmonary resuscitation and emergency cardiovascular care Circulation, there are five essential components to accomplish high quality CPR: : minimizing interruptions of chest compressions, performing chest compressions with adequate frequency and depth, achieving complete chest expansion between compressions, and avoiding excess ventilation.[25] Therefore, we consider our physicians in the current study totally incompetent to perform BLS for children and neonates. While almost all of our physicians (97.3%) knew the correct definition of the abbreviation "BLS", a remarkably lower percentage (22%) knew the correct definition of "AED". These findings could be explained by the facts that "BLS" is the popular title for the course attended by the physicians, hence, it is logic to be familiar with its definition. But for the definition of "AED", they are unfamiliar with it, that could be explained by the advocate of Einav et al (2017) who suggested that many primary care clinics are under-equipped especially with AED, and their physicians are under-prepared to initiate life-saving services.[26]

The only factor significantly associated with difference in level of knowledge about BLS was the qualification, where the average score was significantly higher among those who have MBBS qualification only compared to their colleagues who have postgraduate degrees. Same results were identified in Jamaica, where consultants and chief residents were not able to perform CPR according to new CPR guidelines compared to more junior staff. They explained it by the possibility that "junior staff are more likely to have training in the most recent guidelines, and they are usually the first call person and responsible for carrying out the majority of acute emergencies which may require resuscitation". They emphasized on the necessity of frequent refresher courses, with financial subsidies to encourage participation.[18]

There are limitations, that should be considered when interpreting the findings of the current study, first is being applicable only on physicians in Family Board postgraduate, it lacks generalizability of the results on physicians in other sittings. Second, is the inability to access their actual skills in CPR practice in simulated situation, which represent the other crucial facet of their competence in performance of CPR.

CONCLUSION

From the findings of our study we conclude deficient knowledge of the physicians in the Family Board about Basic Life Support, despite of the previous training in BLS, that could be attributed to the attrition of knowledge along time. The only factor significantly associated with the difference in the level of knowledge about BLS was the qualification, with relative better knowledge among those with MBBS only as being newly graduated with recent updated knowledge about new guidelines. It is strongly recommended to provide frequent updated BLS training courses for the physicians apart from the routinely provided BLS training for renewal of the license.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Alotaibi O, Alamri F, Almufleh L, Alsougi W. Basic life support: Knowledge and attitude among dental students and Staff in the College of Dentistry, King Saud University. Saudi J Dental Res. 2016;7(1):51-6.
2. Aranzábal-Alegria G, Verastegui-Diaz A, Quinones-Laveriano DM, Quintana-Mendoza LY, Vilchez-Cornejo J. Factors influencing the level of knowledge of cardiopulmonary resuscitation in hospitals in Peru. Colombian J Anesthesiol. 2017;45(2):114-21.
3. Monsieurs KG, Nolan JP, Bossaert LL, Greif R, Maconochie IK, Nikolaou NI, et al. European resuscitation council guidelines for resuscitation 2015 section 1. Executive summary. Resuscitation. 2015;95:1-80.
4. Stotz M, Albrecht R, Zwicker G, Drewe J, Ummenhofer W. EMS defibrillation-first policy may not improve outcome in out-of-hospital cardiac arrest. Resuscitation 2003;58(3):277-82.
5. Almesned A, Almeman A, Alakhtar A, AlAboudi A, Alotaibi A, Al-Ghasham YA, et al. Basic life support knowledge of healthcare students and professionals in the Qassim University. Int J Health Sci. 2014;8(2):141.
6. Mellor R, Woollard M. Skill acquisition by health care workers in the Resuscitation Council (UK) 2005 guidelines for adult basic life support. Int Emerg Nursing. 2010;18(2):61-6.
7. Steen P, Kramer-Johansen J. Improving cardiopulmonary resuscitation quality to ensure survival. Current Opinion Critical Care. 2008;14(3):299-304.
8. Bandeira AC, Delmondes T, Oliveira A, Maia J, Guanaes A, Cruz V, Vilas-Boas F, et al. Assessment of the general knowledge of emergency physicians from hospitals of the city of Salvador (Brazil) on the care of cardiac arrest patients. Critical Care. 2007;11(3):100.
9. Mokdad A, Jaber S, Aziz MIA, AlBuhairan F, AlGhaithi A. The state of health in the Arab world, 1990-2010: an analysis of the burden of diseases,

injuries, and risk factors. The Lancet. 2014;383(9914):309-20.
10. El Bcheraoui C, Memish Z, Tuffaha M, Daoud F, Robinson M. Hypertension and its associated risk factors in the kingdom of saudi arabia, 2013: a national survey. Int J Hypertension. 2014;2014.
11. Abolfotouh M, lnasser M, erhanu A, l-Turaif D, lfayez A. Impact of basic life-support training on the attitudes of health-care workers toward cardiopulmonary resuscitation and defibrillation. BMC Health Services Res. 2017;17(1):674.
12. Roccia WD, Modic PE, Cuddy MA. Automated external defibrillator use among the general population. J Dental Educ. 2003;67(12):1355-61.
13. Ong M, Yap S, Chan K, Sultana P, Anantharaman V. Knowledge and attitudes towards cardiopulmonary resuscitation and defibrillation amongst Asian primary health care physicians. Open Access Emerg Med OAEM. 2009;1:11.
14. Handley A, Koster R, Monsieurs K, Perkins G, Davies S, Bossaert L, et al. European Resuscitation Council Guidelines for Resuscitation 2005: Section 2. Adult basic life support and use of automated external defibrillators. Resuscitation. 2005;67:S7-S23.
15. Roshana S, Batajoo K, Piryani R, Sharma M. Basic life support: knowledge and attitude of medical/paramedical professionals. World J Emerg Med. 2012;3(2):141.
16. Flynn J, Archer F, Morgans A. Sensitivity and specificity of the medical priority dispatch system in detecting cardiac arrest emergency calls in Melbourne. Prehospital Disaster Med. 2006;21(2):72-6.
17. Buck-Barrett I, Squire I. The use of basic life support skills by hospital staff; what skills should be taught? Resuscitation. 2004;60(1):39-44.
18. Howell P, Tennant I, Augier R, Gordon-Strachan G, Harding-Goldson H. Physicians' Knowledge of Cardiopulmonary Resuscitation Guidelines and Current Certification Status at the University Hospital of the West Indies, Jamaica. The West Indian Med J. 2014;63(7):739.
19. Price C, Bell S, Janes S, Ardagh M. Cardio-pulmonary resuscitation training, knowledge and attitudes of newly-qualified doctors in New Zealand in 2003. Resuscitation. 2006;68(2):295-9.
20. Chandrasekaran S, Kumar S, Bhat S. Awareness of basic life support among medical, dental, nursing students and doctors. Indian J Anaesthesia. 201054(2):121.
21. Sener S, Ersoy G, Õzsaraç M, Aksay E, Koyuncu N. The current status and factors affecting the level of knowledge regarding basic life support measured in resident physicians. Tip Fakültesi Dergisi. 2006;2:95-101.
22. Iirola T, Lund VE, Katila AJ, Mattila-Vuori A, Pälve H. Teaching hospital physicians' skills and knowledge of resuscitation algorithms are deficient. Acta Anaesthesiologica Scandinavica. 2002;46(9):1150-4.
23. Yang C, Yen Z, McGowan J, Chen H, Chiang W, Mancini ME, et al. A systematic review of retention of adult advanced life support knowledge and skills in healthcare providers. Resuscitation. 2012;83(9):1055-60.
24. Lo B, Devine A, Evans D, Byars D, Lamm O, Lee RJ, et al. Comparison of traditional versus high-fidelity simulation in the retention of ACLS knowledge. Resuscitation. 2011;82(11):1440-3.
25. Ecc Committee. 2005 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation. 2005;112(24 Suppl):IV1.
26. Einav S, Wacht O, Kaufman N, Alkalay E. Cardiopulmonary arrest in primary care clinics: more holes than cheese: a survey of the knowledge and attitudes of primary care physicians regarding resuscitation. Israel J Health Policy Res. 2017;6(1):22.

Cite this article as: Fatani AA, Johani NA, Ibrahim AM. Basic life support knowledge of family medicine residents at joint program of family medicine in Jeddah Saudi Arabia, 2017. Int J Community Med Public Health 2019;6:2372-7.