



KNOWLEDGE AND ATTITUDE ABOUT BASIC LIFE SUPPORT AMONG SCHOOL TEACHERS IN EASTERN PROVINCE

Medicine

Dr. Rabab Mahdi Alhamaqi

MBBS, SBFM resident, ministry of health, eastern province, saudi arabia.

Dr. Diao Abdulwahid Alghanim

MBBS, SBFM resident, ministry of health, eastern province, saudi arabia.
*Corresponding Author

Dr. Elham Aljanahi MBBS, Family medicine consultant, SBFM trainer, eastern province, saudi arabia.

ABSTRACT

introduction: Bystander *Cardiopulmonary Resuscitation* (CPR) is a vital life-saving intervention, easy skills to learn and performed when witnessing a victim of cardiopulmonary arrest. since the School teachers are the first line of interventions in schools where students spend 7 to 8 hours per day thus any life-threatening situation could happen so, School teachers must be aware of BLS performance. this study conducted to assess the awareness and attitude of School teachers regarding BLS.

Methodology An analytic cross-sectional study through self-administered modified questionnaire among 469 from school teachers in Qatif, Dammam and Khobar city, Eastern Province, Saudi Arabia.

the questionnaire was validated by 8 experts from family medicine experts, public health and department of emergency, The questionnaire is divided into five main parts as follows: demographic data section ,Knowledge towards BLS performance ability, Attitude towards BLS. And Barriers.

Results: only 23.8 % of school teachers had previous training, about half of school teachers had poor BLS knowledge. 25.8% Knew the contact numbers for emergency ,44.4% knew what the first step in BLS.

only 14.1% are competent to do BLS if indicated. Majority of secondary school teachers are willing to enroll in BLS courses (92.9%) and Majority of them (90.7%) agree that BLS should be a part of school curriculum . in another hand only (35.3%) agreed that BLS training should be mandatory to their job's certification.

conclusion: Although a majority of teachers not received previous CPR training, and had poor BLS knowledge, willingness to have BLS training was high and having BLS as a part school's curriculum was recommended by the majority of the teachers

KEYWORDS

CPR-school teachers -knowledge – attitude.

INTRODUCTION:

Bystander *Cardiopulmonary Resuscitation* (CPR) is a vital life-saving intervention, easy skills to learn and performed when witnessing a victim of cardiopulmonary arrest.¹ it is performed by a layperson who is not part of the organized emergency-response system in a community² and present at the time of arrest.

cardiac arrest terminates more than 3 million individuals every year³, it carries a high level of mortality risk and a survival rate of less than 8%.⁴ that's mainly because 70% of cardiac arrest occurs out of hospital settings where a few of cardiac arrest victims receive effective life-saving bystander CPR.^{5,6}

bystander's effective CPR will double or triple out-of-hospital cardiac arrest (OHCA) survival rate if it initiates it immediately⁷ because according to AHA its the first link in the chain of OHCA survival.¹

In another hand, this chance will drops by 7%–10% for every minute passing without intervention . and death may occur in 10 minutes after circulation failed to promote adequate blood flow to the vital organs.⁷

However, only 32% of OHCA received bystander CPR⁸ and the European Resuscitation Council and current studies showed that Lack of CPR knowledge and training is the main reason for this low bystander CPR rate.⁹

the limitation of bystander knowledge and training of CPR is varied between countries. The major reason for this variation mainly due to the differences in education and training system.¹⁰ the Limitation on a personal level including the lack of time, lack interest to learn CPR, fear of doing harm, fear of legal responsibility, cultural issues regarding the victim's characteristics¹¹ or fear of getting an infection¹².

In Saudi Arabia, recent local study of out of hospital cardiac arrest survival showed that A low survival rate for non-traumatic OHCA and a 100% mortality rate in traumatic arrests & support the CPR public awareness campaigns efforts in order to increase the OHCA survival rates.¹³

Other recent study evaluating emergencies services in Saudi Arabia show that ambulance response time is much longer than the defined international standard and longer than other regions of the world which decrease survival rate of OHCA. During this time the victim's survival is depending on bystanders initiation of CPR.¹⁴

The Saudi Heart Association (SHA), whose responsible for the CPR activities in Saudi Arabia, released evidenced based 2015 CPR guidelines which recommend that For the OHCA victim, increasing rates of bystander CPR is a must because of its importance as one of the major components of the community Chain of Survival. Also, SHA suggest that communities may train bystanders in compression-only CPR to rescue adult OHCA as an alternative to standard CPR training.¹⁵

Methodology

2.1 Study Design

An analytic cross-sectional study through self-administered modified questionnaire to assess knowledge and attitude about BLS among school teachers was done

2.2 Study setting/ Time

This study was conducted in governmental male and female secondary schools in Qatif, Dammam and Alkhobar Cities, Eastern Province, Saudi Arabia.

the data collection started at June 2017 for 2 months duration.

2.3 Study sample.

All male and female secondary school teachers in Qatif, Dammam and Alkhobar Cities were included.

2.3.1 inclusion & exclusion criteria.

The inclusion criterion involved all teachers in the chosen schools.

the exclusion criteria involved absent teacher, teachers whom in vacation at the time of data collection, teachers who refused participation and any other staff in the chosen schools.

2.4 Study variables.

A. -Independent variables:

- Socio-Demographic data including Age, sex, nationality, educational level, type of school, years of experience.
- Level of background knowledge.
- Source of background knowledge.
- Level of current confidence in performing BLS.

B. -Dependent variables:

- Knowledge about BLS.
- BLS performance.
- Attitude toward BLS.
- Barriers including cost, lack of interest, lack of time, lack of interest, fear of doing more harm, fear of legal responsibility, fear of getting infection & misperceptions.

2.5 Sampling Technique

The study sample was selected randomly through proportionate Stratified Random Sampling technique in multi-stages.

In the first stage, the target population was proportionally Stratified based first on gender (male and female) teachers and then proportionally Stratified based on the type of schools (government and non-government).

On the second stage, schools was recruited based on random sampling, and then teachers were recruited from the schools using convenience sampling.

2.6 Sample Size.

Sample size was calculated Based on the Saudi Ministry of education annual statistics 2017.

Sampling size (n) calculation will be done by Raosoft® calculator and based on assuming a 95% confidence interval (CI) with a degree of precision 5%, beta value of 0.02 and 80% power.

2.7 Data Collection Tool and technique

- By reviewing many similar published articles, the authors did not find a standard research questionnaire. Then, the questionnaire was constructed from tow previously validated in Arabic language questionnaires: Al-Mohaissen MA²⁵ and Ghrayeb F.A.²²
- new questions were developed based on the recent AHA guideline to meet the objectives of this research.
- The questionnaire which exists in the appendix is divided into five main parts as follows:
 - A. demographic data section: 10 items
 - B. Knowledge towards BLS: 10 multiple choice questions
 - C. performance ability: 4 multiple choice questions
 - D. Attitude towards BLS: to be asses in 7 Likert scale questions based on teachers' opinions.
 - E. Barriers: to be asses in 12 Likert scale questions based on teachers' opinions.

2.7.1 Validity

- Eight experts from family medicine experts, public health and department of emergency were asked to review the questionnaire. Its face, construct and content validity was evaluated by them until a valid questionnaire finalized.

2.7.2 Pilot study

- A pilot study was conducted on 35 teachers(whom excluded in the main study sample) to assess the questionnaire's validity & reliability.
- The authors distributed the questionnaire during work hours.
- The authors and data collectors were available to check completion of the data.
- the results of Cronbach's alpha value which was above 8 so, the questionnaire did not need any modification.

2.8 Data processing

- Response rate was not calculated because the samples was collected excced the sample size .
- Data was entered into a personal computer and analyzed by using SPSS software -version 23.
- All variables were coded before entry and checked before analysis.
- suitable statistical test to the data was applied and p-value less than 0.05 will be considered significant.

- Mean, median and Stander deviation was calculated for all continuous data while the percentage was calculated for categorical data.
- The total knowledge score was calculated by sum up the correct answers which was 13 , then less than 6 scores was considered as poor knowledge and score of 6 and above was considered as good knowledge.

RESULTS:

The study included 305 secondary school teachers recruited from alkhubar (23.8%), dammam (43%), and qatif (33.3%). The number of sample collected has exceed the target sample by 15% . All the teachers were Saudi nationality , male teachers were 40.7% whereas female teachers were 59.3 %). There were four age categories; most of the teachers were between 30–39 (44.2%) and 40–49 (44.8%). majority of the teachers has bachelors degree (91.3) . the ratio between male and female teachers was 1:1.5 . Tow-third of the sample had little or no knowledge & training about CPR (65.8%). from those who has knowledge , the sources of their BLS knowledge was vary between T.V 24.5% , Internet 20.8 % , BLS Courses (23.8%) ,other media sources (31.0%) . from those who had knowledge and previous BLS training , only (14.1%) were competent to apply bystander BLS. Majority of those who has no previous training are willing to have BLS training in the future (92.9%) . Around tow third (92.9%) of the their schools has no well trained health counselor(table 1) .

The questions with the highest proportion of correct responses were the Victim choking with sever SOB (72.7%), Heimlich maneuver (70%) , Victim not berating and not respond(68%) and Location of chest compression(69%). On the other hand, questions with the lowest proportion of correct responses were ER contact number (25.8%) and Chest compression per breathing(11.3%) None of teachers answers these questions correctly : When to initiate chest compression (0%) and "Location of checking pulse(0%) (table 2).

Of all respondents , 49% of school teachers had good knowledge about BLS ,while 51% had poor knowledge about BLS .

Table1.the socio-demographic characteristics of teachers

Demographic characteristics	Numbers	Percentages%
Age		
Less than 30 years	23	5
30-39 years	204	44.2
40-49 years	207	44.8
More than 49	28	6.1
Gender		
Male	188	40.7
Female	274	59.3
Level of education		
Diploma	19	4.1
Bachelor	422	91.3
Master	21	4.5
Target cities		
Alkhobar	110	23.8
Dammam	198	42.9
Qatif	154	33.3
Years of Service		
Less than 10 years	161	34.8
10-19	133	28.8
20-29	154	33.3
More than 29	14	3.0
Previous Bls Knowledge & training		
Yes	158	34.2
Little	163	35.3
No	141	30.5
If yes ,Source of knowledge		
T.V	113	24.5
Internet	96	20.8
Bls courses	110	23.8
Others	143	31.0
If previously trained, How competent you are to perform BLS?		
Competent	65	14.1
May be	179	38.7

Not competent	218	47.2
If not trained , do you wish to have BLS training		
Yes	429	92.9
No	33	7.1
Availability of BLS trained health counselor at School		
Yes	148	32.0
NO	314	68.0

Table 2 Teachers' performance on the knowledge and skills assessment (13 questions)

Items	Correct Answers (n)%	Incorrect Answers (n)%
BLS correct steps	(205) 44.4	(257) 55.6
Collapsed Victim what next	(314) 68.	(148) 32.
Breathing collapsed victim what next	(207) 44.8	(255) 55.2
ER contact number.	(119) 25.8	(343) 74.2
When to initiate chest compression	0	(462) 100.
Chest compression per breathing	(52) 11.3	(410) 88.7
When to stop BLS	(220) 47.6	(242) 52.4
complication of leaving collapses victim lying on his back	(154) 33.3	(308) 66.7
Victim choking with sever SOB	(336) 72.7	(126) 27.3
Location of checking pulse	0	(462) 100.
Location of chest compression	(319) 69.	(143) 31.
Hand positioning for chest compression	(298) 64.5	(164) 35.5
Heimlich maneuver	325 70.3	(137) 29.7

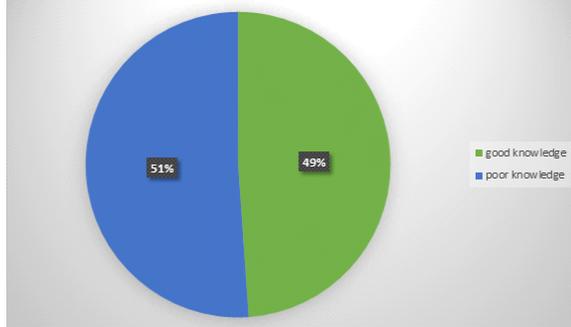


Figure 1 : knowledge about BLS among teachers

Analysis of knowledge and demographic characteristic's among teachers:

The effect of training was examined by comparing the knowledge score between teachers with and without previous knowledge and the results showed that Good BLS knowledge were significantly higher among teachers who had Previous BLS knowledge (94 41.6%) than not have previous (53 23.5%) (P = .001) and significantly higher among teachers whose were Competent to perform BLS (56.9%) compare to non-competent teachers (39.4%)(P=0.001).

good BLS knowledge were also significantly higher among teachers whose T.V was their Source of BLS knowledge (p=0.003).

Table 3 shows the association between the BLS and socio-demographic characteristics of the participating teachers

	Good knowledge	Poor knowledge	X2	P value
Age			2.220	.528
less than 30	12 5.3%	11 4.7%		
31-40y	101 44.7%	103 43.6%		
41-50	96 42.5%	111 47.0%		
more than 50	17 7.5%	11 4.7%		
Sex			.584	.445
male	96 42.5%	92 39.0%		
female	130 57.5%	144 61.0%		
Level of education			.350	.839
diploma	9 4.0%	10 4.2%		
bachelor	208 92.0%	214 99.7%		
master	9 4.0%	12 5.1%		

City of Schools			5.329	.070
Qatif	87 38.5%	67 28.4%		
Dammam	90 39.8%	108 45.8%		
AL Khobar	49 21.7%	61 25.8%		
Previous BLS knowledge			14.32	.001
Yes				
Little	94 41.6%	64 27.6%		
No	79 35.0%	84 35.6%		
	53 23.5%	88 37.3%		
Willingness for BLS			.096	.757
Yes	209 92.5%	220 93.2%		
No	17 7.5%	16 6.8%		
Competency to perform BLS			14.81	.001
Yes	37 56.9%	28 43.1%	6	
Little	103 57.5%	76 42.5%		
No	86 39.4%	132 60.6%		
Health counselor			.459	.498
At school				
Yes	69 46.6%	79 53.4%		
No	157 50.0%	157 50.0%		
Source of BLS information			14.31	.003
T.V	72 63.7%	41 36.3%	1	
Internet	42 43.8%	54 56.3%		
Courses	53 48.8%	57 51.8%		
Others	59 41.3%	84 58.7%		
Years of service			.777	.855
Less than 10	78 48.4%	83 51.6%		
10-19	69 51.9%	64 48.1%		
20-29	72 46.8%	82 53.2%		
More than30	7 50.0%	7 50.0%		

Attitude of teachers regarding BLS

The majority of teachers (90.7%) reported that BLS should be a part of school curriculum while tow third of them (64.8%) felt that BLS training should not be mandatory to their job (Table 3). When asked about reason of lack of BLS training , about tow third of the teachers (66.5%) answered that they don't know any training centers and (42.4%) thoughts that lack of time is the reason . when asked about reason of lack of BLS knowledge ,(68.4%) of the teachers thought that knowing BLS is for medical staff only . about reasons of hesitancy in performing BLS , half of teachers (50%) had fear of doing more harm , (33.1%) had no confident ,(43.3%) had fear of responsibility and only (18.6%) had fear of getting infections (table 4)

Table4: attitude of school teachers regarding BLS

ITEMS	Numbers	Percentages
Reasons of lack of knowledge		
Lack of time	183	39.6
Lack of interest	81	17.5
Only medical staff should know	316	68.4
Reasons of lack of BLS training		
Lack of time	196	42.4
Cost	123	26.6
Do not know any training centers	307	66.5
Lack of interest	82	17.7
Reasons of hesitancy in BLS performing		
Fear of causing harm	231	50.0
Not confident	153	33.1
Fear of responsibility	200	43.3
Fear of infection	86	18.6
Who should have BLS training?		
Doctors	448	97.0
Medical staff	443	95.9
ER stuff only	451	97.6
teachers	380	82.3
All people	364	78.8
BLS training should be a part of School curriculum		
Agree	419	90.7
Neutral	29	6.3
Disagree	14	3.0
BLS training should be mandatory for teachers		
Agree	163	35.3
Neutral	131	28.4
Disagree	168	36.4

Discussion:

The researcher collected data from a total of 469 respondent from schools in Qatif, Dammam and Khobar city, Eastern Province, Saudi Arabia, Then about half of school teachers of our study sample respondents had poor knowledge (51.%)

Local and foreign studies have been conducted in several countries, which resulted in similar findings: In Riyadh 43% of school teachers know about CPR²⁴

Moreover, In Qassim²³ and other countries like Belgium¹⁹ and turkey²¹ that CPR knowledge among teachers is low. However, In Palestine generally got only 42.5%²².

Approximately 23.8 % of the sample reported that they have taken CPR course, and those with training have higher scores than those without training. Similar findings on Belgium Previous CPR training had a significant effect on knowledge ($P < 0.005$) Teachers with previous training performed better on and observed for knowledge between the different age groups ($P < 0.005$)¹⁹. Teachers between 21 and 30 years old differed significantly from teachers between 30 and 40 years old, 41–50 years old and 51–61 years old, also in Palestine were significant differences between groups ($p=0.001$)²².

opposite of the study done in AL Qassim the results shows but those with training did not have higher scores than those without training. One potential explanation for the low knowledge is that the CPR training was taken more than two years prior to this study.²³

Previous studies in Saudi Arabia have examined knowledge among teachers and knowledge among community members and health workers was also low those with training did not have higher scores than those without training²⁴

Furthermore, our study showed that knowledge varied according to type of question. For example, there was higher knowledge on question as what to do while the Victim choking with sever SOB and when do Heimlich maneuver, while there was lower knowledge on basic questions such as the emergency number and Location of checking pulse. In another hand study in Qassim showed that there was higher knowledge on basic questions such as the emergency number and calling for help immediately while there was lower knowledge on the more technical skill questions such as the use of the AED and exact depth and frequency of chest compressions²³, also in Palestine study there was higher knowledge on Number of emergency (81.9) and lower on Man collapsed what next (25.2) . in Belgium¹⁹ there was higher knowledge on (87%) correct number of ER and Lower on Correct chest compression depth and rate (33%)²²

In our study, only 23.8% of the teachers had previous CPR training which is similar to the results found in Saudi studies done in Riyadh and Qassim^{23,24} in last 3 years but this is very low in comparison to a survey among 4273 teachers done in Belgium²⁷, which showed that 59% of them had received CPR training.

Regarding reasons of lack of previous BLS training, “do not know any training centers” (66.5%) followed by “lack of time” (42.4%), were the major reasons Which is similar to those found in previous studies except that lack of time factor was the most affecting reason^{23,24,25,27,21}

Of the participants, (14.1%) felt competent to perform BLS when it indicted while (85.9%) were hesitant to do it mostly because of fear of doing harm (50%) and (43.3%) fear of responsibility . this is can be explained by the results of our current study which show low level of knowledge and skills about BLS techniques. The studies in Saudi arabia show similar results as well as the Belgium study which show that Sixty-one percent did not feel capable to perform BLS , mainly because of a perceived lack of knowledge.

The source of previous knowledge about BLS was television (24%) and other media 31% which represent the vital role of the media to increase the awareness of BLS training among the community.

Only (35.3%) support that BLS certification should be mandatory for teachers which is low compared to the studies performed in Saudi Arabia^{23,24} which showed that more than (50%) of teachers agreed to have mandatory BLS training as well as the Palestinian²² study done among school teachers in Hebron which show that (77.4%) of teachers

reported that BLS should be mandatory for teachers.

The willingness to have BLS training in the future in our study is (92.9%) which is positively high in the eastern region of Saudi Arabia compared with previous studies in done in Qassim , Riyadh , palestine turkey and united kingdom^{21,22,23,24,27}.

More than 90% of the secondary school teachers in our study thought that BLS training should be mandatory in school curriculum compared to (68%) in the Riyadh , (75%) in Qassim study and 41% in Belgium study^{23,24,27}.

In many states in the United States and united kindgdom, CPR training is mandatory for students as well for teachers as vital requirement of teacher certification and re-certification. and it was well received and studies done after mandatory inclusion of BLS showed improvement in the knowledge as wells in skills of BLS.^{5,7,24,27}

Currently BLS is not mandatory for teachers or students but As the risk of cardiac events increased in Saudi arabia as sequences of increasing prevalence of obesity, smoking and other risk factors of cardiovascular diseases, while the ambulance response rate is very long in central cities, this increase the importance of having competent well trained school teachers to improve the survival rates of out-of-hospital cardiorespiratory arrest.^{13,14}

The limitation of our study include that its covers only Saudi teachers and governmental schools

CONCLUSION:

Although a majority of teachers not received previous CPR training, and had poor BLS knowledge, willingness to have BLS training was high and having BLS as a part school's curriculum was recommended by the majority of the teachers

Recommendation:

1. We recommend that BLS training should be mandatory to all teachers at schools and universities, This training should be periodically reinforced in the form of Focused programs/seminars and hands on workshops addressing for example every 6 months as recommended by AHA for bystanders who's not always facing cardiac arrest
2. BLS training should be added to the Schools curriculum
3. In addition to enrolling in training courses, teachers must be aware of the availability of first aid kits at schools and must be trained on it.
4. Further studies in this field are greatly recommended to adress the knowledge, attitude, and practices of the BLS among school teachers after BLS training to assess the effectiveness of BLS courses in all provinces of Saudi Arabia .

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