Effectiveness of First-Aid and Basic Life Support Intervention Program on School Health Advisors

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Abstract

Background: school environment is the best expected setting for emergency instances that deserves first aid measures. **Aim:** The aim of the present study is to assess the effect of an intervention program regarding first-aid (FA) and basic life support (BLS) on the knowledge and practice of school health advisors. **Methods:** A quazi-experimental research design was conducted on 168 randomly selected female participants who were working in different governmental primary, preparatory and secondary schools in Unaizah city, Qassim Province, KSA. Knowledge and practice of the studied participants were tested before applying a program for FA and BLS using an interview questionnaire. Immediately after the program application, their knowledge and practice were retested using the same questionnaire and a gain after 6 months interval. **Results:** The findings revealed that 44.1% of the study sample had secondary education. Only 22% among the study group were previously attended training about FA and BLS. The study participants, generally, had poor knowledge and incorrect situational practice in the pretest. A statistically significant improvement was shown in the knowledge and practice at post and follow-up tests. **Conclusion:** First aid and basic life support intervention program showed a significant effect in the form of a remarkable increase in the participants' level of knowledge and practice. **Recommendation:** Training programs about FA and BLS should be adopted as an element of the services offered to school health advisors and updated at regular intervals.

Keywords: first aid, basic life support, school health advisor, an intervention program.

1. Introduction

First aid (FA) is defined as the aiding conducts and first care delivered for a severe illness or injury (Singletary et al., 2015). FA is backed not only with physical injury or illnesses, but also with other primary care including psychosocial support for people undergoing emotional suffering from exposing or seeing a traumatic event or injury (International Federation of Red Cross and Red Crescent Societies, [IFRCS], 2011). It is a set of trained maneuvers and skills given before regular medical aid can be attained. It must be ready accessible, easy to use by bystanders or by the victim with least or no medical equipment (Cuttle, 2009 & Markenson et al., 2012). However, Singletary et al., 2015, recommended that addition of equipment by those who trained on it, may improve care. FA can protect lives and restricted harm up to specialized help has arrived (Van de Velde et al., 2007). Bollig, Wahl & Svendsen, (2009) recommended that life-supporting first aid skills (LSFA) including basic life support (BLS) and cardiopulmonary resuscitation (CPR) should be part of basic health education for laypersons.

Moreover, Schünemann, Brożek, Guyatt & Oxman, (2013) added that first aid can be introduced by any person in any location. But, it should be refined according to circumstances, need, and regulatory controls. Accordingly, they strongly believe that education in first aid should be worldwide: everyone can and should learn first aid. International Federation of Red Cross and Red Crescent Societies, [IFRCS], (2009) reported that first aid measures can be life-saving at work, school, home and in community setting. This could include performing procedures such as: placing an unconscious patient into the recovery position, performing CPR, and stopping bleeding using pressure and evaluation.

First aider is defined as someone trained in first aid. He is the first contact person as care presenter to provide first aid measures. He must practice the perception of what to make sure to do and what not. He should weight that his first aid knowledge and skills can minimize injury and future disability (Cave et al., 2011). Accordingly, he must be taught correctly. He must avoid mistakes that mean the difference between life and death, between temporary and permanent impairment and between rapid recovery and long hospitalization (Devashish, Gaurav & Bharat, 2013). The role of first aider is to provide immediate, lifesaving, medical care before the arrival of further medical help. He should recognize, assess, and prioritize the need for first aid. He provides care by using appropriate competencies. He recognizes limitations, and seek additional care when needed (Markenson et al., 2010).

School accidental injuries and accidental contamination during school day are considered a threat to the life of the school children and adolescents. The key problems in modern societies are accidental injuries, fainting, burns, accidental falls, poisoning, cut injuries and fractures etc…. And many of young adults lose their lives or become disabled in such situations (Dasgupta, Bandyopadhyay & Das, 2014). Statistics show that accidents are one of the most common potential causes of morbidity and mortality among persons from age one to 38 years (Van de Velde et al., 2009). Children and teachers spend most of their time within school environment, which is the most expected site for these episodes that may require immediate administration of FA and BLS services (Bildik et al., 2011).

Teachers are the first ones who should deliver first aid and save their lives and young adults at the school. Accordingly, school teachers should have enough knowledge regarding managing first aid in crisis situations. Nonetheless, it was evidenced that most of the teachers do not have enough first aid knowledge and correct practice in some cases (Baser et al., 2007).

Studies have shown that most of the school teachers had low level of knowledge and practice regarding FA and BLS. In a study carried out in AlMadinah Al-Munawarah City, KSA, by Wesam (2014), on 314 school instructors to identify the prevalence of first aid knowledge, a low level of knowledge about using first aid in dealing with emergencies was observed. Thirty percentage of the participants had encountered with an emergency conditions, 29% of them applied the first aid, 57.4% asked for help and the rest did nothing. Another study in Ireland, conducted by Abernethy et al., (2003) to determine the knowledge on immediate care of school sport injury among physical education teachers at schools. This also showed poor knowledge of teachers in how to treat children during emergencies.

In the Arab world, with increasing request for the school health care facilities and a high cost to contact a medical care, a health advisor is available instead of professional health care provider. He is considered to be revenues to make more efficient use of the available school health services and improving the health of the students at low cost (Jabbour, 2013). The health advisor is a school teacher who is chosen by the school to provide basic health and medical care services to the students. The school health advisors are given a limited training, supplies and support to provide essential primary health care services to the students.

Now extensive changes in schools have required that the role of SHAs is notably wide ranging. SHAs are highly skilled professionals, and are in fact the only trained teachers working between health and education. They provide an essential link between school, home and the community that helps protection the wellbeing of the students (Brown, 2015). In addition, Plant & Taylor, (2013) and Celik, (2013) added that the basic part of the role of SHA, is responsibility for creating school as long as a safe and healthful workplace. SHAs are reflected as trained health care providers on-site. He/she can be the first person at the scene of school accidents or medical emergencies. Hence, they should be trained in FA and BLS procedures and be able to put these procedures into practice. Accordingly, Hirca, (2012), recommended that SHAs need urgent, correct and repetitive trainings on the FA and BLS skills.

Thus, the professional health care providers (trained nurses or physicians) are responsible to educate and practice SHAs on FA and BLS skills. To our knowledge, it is the only study dealing with training SHAs on FA and BLS skills in KSA.

1.1 Aim:
The aim of the current study was to assess the effect of an intervention program regarding first-aid and basic life support on the knowledge and practice of male and female school health advisors.

1.2 Research Question:
The research question was: to what extent a first aid and basic life support intervention training program to school health advisors is effective in improving their knowledge and practice?

2.   Materials and Methods

2.1 Research design:
A Quasi-experimental design, was utilized to study the impact of the independent variable (first aid and basic life support intervention program) on the dependent variable (knowledge and practice of school health advisors).

2.2 Research setting:
The study was carried out in the center of educational training for trainees, Unaizah city, Qassim Province, Kingdom of Saudi Arabia.

2.3 Participants:
A systematic random sample of 168 female school health advisors was participated. Where the first name was

selected by the blind method and then followed by selection of each third name from the lists of the school health advisors present in the male and female school health units.

As self-reliant units, holons have a degree of independence and handle circumstances and problems on their particular levels of existence without reaching higher level holons for assistance. The self-reliant characteristic ensures that holons are stable, able to survive disturbances.

2.4 Sample size:

The sample size was calculated using the following equation:

$$Sample\ Size = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1+(\frac{z^2 \times p(1-p)}{e^2 N})}$$

Whereas: Population Size = N | Margin of error = e | z-score = z

e is percentage, put into decimal form. The z-score is the number of standard deviations a given proportion is away from the mean. At 0.05, desired confidence interval was used at 80%. So, z-score was 1.28 and 10% expected drop out. The sample size was 168 female school health advisors who were working in different governmental primary, preparatory, and secondary schools, Unaizah city, Qassim Province

2.5 Tools of data collection:

In order to achieve the purpose of this study, the researchers designed an interview questionnaire form to collect data pertinent to the study variables. It consisted of three parts as follows:

Part (1): Demographic characteristics of studied personnel and previous training about first aid and basic life support data Sheet: Demographic data consisted of items related to age, educational level, years of experience and previous training about first aid and basic life support.

Part (2): knowledge questionnaire sheet: It included 16 questions, 12 closed and 4 open ended questions, covering various aspects of first aid, such as definitions, knowledge about how to deal with wounds, poisoning, chemicals, electrocution, epistaxis, burns, fractures, choking, as well as BLS. For each knowledge question, a correct response was scored one, and the incorrect was zero. All items of knowledge were summed up for each participant and then converted into a percentage score. The participant's knowledge was considered good if the total score was 60% or more and poor if it was less than 60% based on the panel of experts and similar studies (Wafike & Tork, 2014; Martin & Jolly, 2002; Contreras *et al.*, 2006).

Part (3): The assessment for the practice of first aid questionnaire sheet: It consisted of eight situations representing problems, such as fainting, choking, burns, poisoning, epistaxis, wounds, chemical/electrocution and fractures, and the first aid required for each problem. For each situation, a correct response was scored as one, and incorrect was scored as zero. The scores of the eight items were summed up and converted into a percentage score. The participant's practice was considered correct if the score was 60% or more and incorrect if less.

2.6 Content validity and reliability:

The tool was revised by 5 panel of expertise in the field of medical surgical nursing and community medicine to determine its validity. The experts' responses were represented in four points rating score ranging from (4-1); 4= strongly relevant, 3= relevant, 2= little relevant, and 1= not relevant. Validity of the questionnaires based on experts opinions were calculated and found to be = (98%). The reliability for the study tools was calculated by Cronbach's alpha, it was 0.897 for questionnaires part 2 and 0.980 for part 3.

2.7 Pilot study:

A pilot study was conducted on 17 participants who were excluded from the study sample. It was conduct to test the questionnaires for their clarity, organization, applicability and to determine the length of time needed to collect the data. The necessary modifications were done.

2.8 Field work:

An official permission letter was obtained from the Directorate of Ministry of Education for headmasters of the schools of selected participants at Unaizah City, Qassim Province. After explaining the aim of the study, Headmasters of primary, preparatory and secondary female schools asked their selected SHAs to participate. The study protocol was approved by the Ethical Research Center of Unaizah college of Medicine and Medical Sciences. Informed consent was obtained from every participant who included in the study after explanation the aim of the study and assuring them of confidentiality of the collected data.

The researcher carried out the fieldwork through assessment, planning, implementation and evaluation phases.

The assessment phase started by meeting with SHAs at school health unit. The researchers started by introducing themselves to the participants, explaining to them the importance of the study and its procedures, and inviting them to participate. The pretest was filled for needs identification. Each participant took approximately 15 minutes to complete the questionnaire. An analysis of the obtained pretest data was then done to help with the design of the intervention program.

The planning phase involved designing the program based on the needs identified from the assessment phase, in addition to literature. The content included first aid topics such as definitions, bleeding/epistaxis, fracture, poisoning, burn, chemical/electrocution chocking as well as BLS. The instructional materials which were used in the process of training were included a booklet prepared by the researchers though literature review, video tapes, power point presentation that containing information about first aid, demonstration using real objects as bandage, splints and simulator as CPR doll. The booklet was given to each participant at the end of sessions to refresh their knowledge. The program topics were organized according to priority of educational needs among the study participants. It consisted of 24 sessions including theoretical and practical parts. Each session lasts 1 hour, 2 session per day, and 2 days per week for a period of 6 weeks.

The implementation phase consisted of four sessions, two for the theoretical part and the other two for the practice part. The study participants divided into six groups. Each group numbers was 28 SHA. The implementation of the program was done with each group separately. Each group then divided into five subgroups. Each session was carried out into 1 hour, including a lecture regarding first aid and basic life support, question time, and performance of first aid and basic life support by using videos demonstration, cardiopulmonary resuscitation doll, role play situation and practical demonstration according to the following sequence; (chocking, CPR, fainting, wound, bleeding / epistaxis, fracture and burn). The sessions were held from 8 – 10 morning at the center of training trainees on Sundays and Wednesdays.

The evaluation phase involved immediate posttest after the intervention and a follow up assessment 6 months after intervention program.
Data collection was carried out in the period from May to October 2015.

2.9 Ethical considerations:
Ethical approval was obtained from the Research Ethics Committee in Unaizah College of Medicine, Qassim University. An administrative approval was obtained from the Directorate of Ministry of Education for headmasters of the schools of selected participants. Permission for the study was taken from the headmasters of the schools of selected participants in Unaizah city, Qassim province. In addition, each participant was informed about the purpose of the study and its importance. The researchers emphasized that participation in the study is entirely voluntary; anonymity and confidentiality were assured through coding the data. Informed consent was obtained from each participant who agreed to participate in the study.

2.10 Statistical Analysis:
Data entry and statistical analysis were done using the SPSS Statistical Package for the Social Science (version 18). Data was presented using descriptive statistics in the form of frequencies and percentages. Interval and ratio variables were presented in the form of means and standard deviations. Qualitative variables were compared using χ^2 test. Correlation analysis was used for the assessment of the inter-relationships among scored and ranked variables to identify the independent predictors of the improvements in knowledge and practice scores using r-test. Statistical significance was considered at **P<0.05**.

3.   Results:

Table 1. Demographic characteristics of the studied group and previous training about first aid and basic life support (No=168).

Socio-demographic characteristics	M ± S.D.	Range
Age (in years)	31.96±2.61	21–45
Years of experience	9.42±2.32	2–19
Education Level:	NO	%
Secondary Diplom University	74 60 34	44.1 35.7 28.2
Previous training about first aid and BLS: Yes No	 37 131	 22 78

This table shows that the mean ± SD age of the studied group was 31.96±2.6, 44.1% were secondary education and only 22% previously attended training about first aid and BLS.

Table 2. Comparison between intervention phases regarding level of knowledge about first aid and basic life support among the studied group.

Good knowledge (≥60%)	Studied group (No=168)						P1-value	P2-value
	Pre-test		Post-test		Follow up			
	No	%	No	%	No	%		
Definition	3	1.8	168	100	160	95.2	<0.001	<0.001
Bleeding/epistaxis	13	7.7	164	97.6	158	94.0	<0.001	<0.001
Chocking	14	8.3	162	96.4	155	92.3	<0.001	<0.001
Fractures	11	6.5	168	100	162	96.4	<0.001	<0.001
Burns	19	11.3	167	99.4	160	95.2	<0.001	<0.001
Poisoning	9	5.4	160	95.2	155	92.3	<0.001	<0.001
Wounds	43	25.6	161	95.8	153	91.1	<0.001	<0.001
Chemical/electrocution	21	12.5	160	95.2	151	89.9	<0.001	<0.001
Basic Life Support	0	0.0	155	92.3	149	88.7	<0.001	<0.001
Total Knowledge: Good Poor	 3 165	 01.8 98.1	 168 0	 100 00	 164 4	 97.6 2.4	<0.001	<0.001

P1 between pre-test and post-test.

P2 between pre-test and follow up.

Test of significant is chi-square test (χ^2). P-value <0.001 is highly significant.

For the studied group, the frequency of good knowledge (≥60%) regarding all components of first aid and basic life support program was significantly higher in the post intervention and follow up phases than the pre intervention phase (P<0.001).

Table 3. Comparison between intervention phases regarding situational practice about first aid and basic life support among the studied group.

Correct Situational Practice (≥60%)	Studied group (No=168)						P1-value	P2-value
	Pre-test		Post-test		Follow up			
	No	%	No	%	No	%		
Fainting	1	0.6	165	98.2	161	95.8	<0.001	<0.001
Bleeding/epistaxis	2	1.2	166	98.8	159	94.6	<0.001	<0.001
Chocking	3	1.8	164	97.6	157	93.5	<0.001	<0.001
Fractures	2	1.2	168	100	161	95.8	<0.001	<0.001
Burns	1	0.6	167	99.4	158	94	<0.001	<0.001
Poisoning	4	2.4	164	97.6	162	96.4	<0.001	<0.001
Wounds	7	4.2	168	100	161	95.8	<0.001	<0.001
Chemical/electrocution	5	3	164	97.6	157	93.5	<0.001	<0.001
Basic Life Support	0	0	161	95.8	154	91.7	<0.001	<0.001
Total practice:								
Correct	2	1.2	161	95.8	157	93.5	<0.001	<0.001
Incorrect	166	98.8	7	4.2	11	6.5		

P1 between pre-test and post-test.

P2 between pre-test and follow up.

Test of significant is chi-square test (χ^2). P-value <0.001 is highly significant.

Regarding practice, there was significant improvement in the correct situational practice (≥60%) in the post intervention and follow up phases than the pre intervention phase (P<0.001).

Table 4. Correlation between knowledge, practice scores and demographic characteristics of the studied personnel.

Demographic characteristics	Pre-test		Post-test		Follow up	
	Knowledge	Practice	Knowledge	Practice	Knowledge	Practice
Practice score	0.06		0.46*		0.39*	
Age	-0.11	-0.09	0.35*	0.33*	0.29*	0.31*
Education level	0.16	0.14	0.29	0.31*	0.26*	0.36*
Years of experience	0.02	0.08	0.39*	0.41*	0.36*	0.31*

* = significant

Test of significance is correlation (r) test. P-value <0.001 is highly significant.

With increasing age, education level and years of experience, both good knowledge and correct practice performance was increased significantly in the post intervention and follow up of intervention phases (P<0.001).

4. Discussion

Injury remains a significant school health concern and is often the result of at-risk physically energetic related behaviours. When children and adolescents are injured, actions taken by SHAs are of vital importance. Timely first aid and BLS act to lessen the severity of injury. Consequently, research had identified schools as an ideal setting for learning FA and BLS skills as a means of injury prevention (Reveruzzi et al., 2013).

The current study findings showed that 44.1% had secondary education and only 22% previously attended training about first aid and BLS. Two studies supported the results of the current study, the first one was done by Masih, Sharma & Kumar (2014), who reported in their study about knowledge and practices of primary school

teachers about first aid management of selected minor injuries that majority (98%) of school teachers were female and majority (86%) of them did not previously attended training about first aid. The second study carried out by Devashish et al., (2013) who reported in their study assessment of knowledge and practices of first aid among the school teachers that only 2.96% teachers had previously received first aid training. The current findings are in contrast with a study done in Jeddah, KSA by Bashir & Bakarman, (2014) on the preparedness of female primary school staff when faced with emergency cases. They detected that more than half of the respondents (58.5%) had previous training in first aid and BLS. This contrary in the finding may be revealed to awareness of teachers lived in a big city like Jeddah about importance of training programs for FA and BLS.

Regarding level of good knowledge and correct practice about FA and BLS, the present study showed that both were significantly higher in the post intervention and follow up phases than the pretest (P<0.001). These findings are consistent with Masih et al., (2014) who reported that participants' knowledge and practices were after improved a teaching program (pretest knowledge mean score was 27.32 ± 5.73 and posttest knowledge mean score was 34.76 ± 4.35 and pretest practices mean score was 14.52 ± 2.39 and posttest practice mean score was 18.52 ± 2.63).

This findings is also, in line with a study conducted in Port Said City, Egypt, by Abdella, et al., 2015 on intervention program for the kindergarten teachers about pediatrics first aids. The study results revealed that high significant improvement of knowledge and practice of the studied group in the post and follow up intervention in comparison to pre intervention. Additionally, the knowledge mean and SD for pre, post and follow intervention were 22.2 ± 5.0, 35.7 ± 4.7 and 33.3 ± 5.3; respectively. Also, the total practice was improved in post and follow up intervention compared to pre intervention as cleared by mean and SD of 17.4 ± 6.6, 16.1 ± 7.8 and 9.2 ± 5.1; respectively.

Other similar findings, which showed the effectiveness of a planned educational intervention program about FA and BLS was also observed in the form of improving knowledge and practice of the studied primary school teacher groups in India by Maloti, (2006) and in Morocco by Toure et al., (2011)

Further, the finding of the present study is supported by Li, et al., (2012) who conducted a study on pediatric first aid knowledge and attitudes among staff in the preschools of Shanghai, China. According to this study the level of first aid knowledge among personnel who care for children was low. There is an urgent need to educate preschool staffs about first aid practices and they had recommended that pediatric first aid training should be more widely offered to the preschool teachers.

Regarding retrieving knowledge and practice skills of FA and BLS, this is apparent in the findings of the current study which revealed that the good knowledge and correct practice regarding FA and BLS among SHAs after a period of 6 months decrease in comparison with post immediately test. This is in agreement with a study carried out at Jeddah, KSA by Bashir & Bakarman, (2014) who concluded that female primary school staff were found to have insufficient level of knowledge and practice of FA and BLS. Although more than half of them had previous received training. Another study done in China by Feng et al., (2014) on the effects of pediatric first aid training on preschool teachers. They suggested that the retention of knowledge and skills about first aid declined over time. In the pretest, 1067 people responded with a mean of 21.0 correct answers out of 37 questions, whereas in the post-test period, the mean score increased to 32.2 correct answers (P <0.001). There was a decrease in scores from post-test to 6 months after training, whereas after 6 months the mean score decrease to 28.5 correct answers. However, the mean at the 6-month was higher than the pretest mean (P < 0.001).

Moreover, an American study was conducted by Olympia, Wan & Avner, (2005) on school nurses, it was reported that despite the presence of emergency response plan in the majority of the participating schools, only 33% of the schools were practicing the plan in a periodic interval and 35% of the schools had never practiced the plan. This means that practical training should be repeated in regular intervals to improve the skills and update the knowledge of the first aid provider.

Regarding correlations between knowledge and practice scores and demographic characteristics, the main findings from this study showed that with increasing age, education level and years of experience, both good knowledge and correct practice performance were increased significantly in the post intervention and follow up of intervention phases (P<0.001). This means that the correlation is in a positive direction and when knowledge increases practices also increases. This is congruent with Meissner, Kloppe & Hanefeld, (2012) who reported that training should start at an early age, be repeated at regular intervals and be hands-on oriented because receiving theoretical training only is not enough for good performance.

The findings of current study are also consistent with a recent Egyptian study by Abdella, et al., 2015, who found significant association between improving knowledge and practice with teachers' age, years of experience and previous training session. Another study conducted by Perera & Molligoda, (2014) on knowledge and practices regarding FA among school teachers. They concluded that there is a significant positive association between age,

previous FA training, work experience and improving knowledge level about FA and BLS. This is consistent with the American study by Olympia, et al., (2005) where the knowledge was found to be better with trained teachers compared to those without training.

In summary, FA and BLS are crucial for saving life and minimizing the magnitudes of injuries and illnesses until gaining help from the medical practitioner or nurse. SHAs are responsible persons in the schools for delivering FA and BLS in these circumstances. Unfortunately, the results endorse a universal lack of knowledge and practice regarding FA and BLS among SHAs school teachers. Considering these facts, the researchers would like to recommend necessity and importance of FA and BSL intervention program among SHAs in a regular bases.

4. Conclusion

Although the importance of having knowledge regarding FA and BLS as well as the ability to practice them in school, unfortunately, the majority of the studied SHAs had low level of knowledge and practice pre-intervention. The intervention program of FA and BLS was effective in improving knowledge and enhancing practice of SHAs.

5. Recommendations

First aid and basic life support training should be compulsory for all SHAs in the schools. This training should be periodically continued re-assessment and updated at regular intervals. It should be a part of school health advisors' continuous professional development.

Replication of this program with larger sample size for confirmation and improvement of its procedures and content. Furthmore, researches are needed to assess the impact of such programs on the incidence and consequences of school-age student injuries.

References

Abdella, NH., Nagwa Rizk Mohammed Abu-Elenen, NR., Elkazaz, RH. and Moussa, MM. (2015). Intervention program for the kindergarten teachers about pediatrics first aids. American Journal of Research Communication, 3(5):178-194. Available at: www.usa-journals.com.

Abernethy, L., MacAuley, D., McNally, O and McCann, S. (2003). Immediate care of sport injury. nj Prev. 9:270-273 doi:10.1136/ip.9.3.270.

Bashir, S. and Bakarman M. (2014). Are Our Children in Safe Hands? Evaluating the preparedness of primary school staff in Jeddah, Saudi Arabia in responding to health related emergencies. Life Science Journal, 11(11): 986-989. http://www.lifesciencesite.com/lsj/life1111/173_27427life111114_986_989.pdf

Başer, M., Çoban, S., Tasci, S., Sungur, G. and Bayat, M. (2007). Evaluating First-aid Knowledge and Attitudes of a Sample of Turkish Primary School Teachers. Journal of Emergency Nursing, 33(5): 428–432. http://dx.doi.org/10.1016/j.jen.2006.11.003

Bildik F, Kılıçaslan İ, Doğru C, Keleş A, Demircan A. (2011). The Need for First Aid Awareness among Candidate Teachers. Turkish Journal of Emergency Medicine, 11(4), 166 – 170.

Bollig, G., Wahl, HA. & Svendsen, MV. (2009). Primary school children are able to perform basic life-saving first aid measures. Resuscitation, (80), 689-692. Available at: www.sciencedirect.com

Brown, E. (2015), The role of the school health advisor. Available at: https://www.northumbria.ac.uk/static/5007/hces/rsha.pdf.

Cave DM, Aufderheide TP, Beeson J, Ellison A, Gregory A, Hazinski MF,Hiratzka LF, Lurie KG, Morrison LJ, Mosesso VN Jr, Nadkarni V, Potts J,Samson RA, Sayre MR, Schexnayder SM. (2011). Importance and implementation of training in cardiopulmonary resuscitation and automated external defibrillation in schools: a science advisory from the american heart association. Circulation, 123(6):691–706.

Celika, S. A. (2013). Media comparison study on first aid instruction. Health Education Journal, 72(1):95-101.

Contreras, E. Rojas-Ramirez, JA., Mendoza-Patino, N. and Contreras-de la parra, CB. (2006). Pharmacological performance: an alternative assessment procedure for undergraduate students. Proc.West. Pharmaccol. Soc. 49:172-172.

Cuttle, L., Pearn, J., McMillan, JR., and Kimble, RM. (2009), A review of first aid treatments for burn injuries. Burns; 35, 768-775. Available at www.sciencedirect.com.

Devashish, AR., Gaurav, JD. & Bharat, B. (2013). Assessment of knowledge and practices of first aid among the school teachers of Vadodara City. IJRRMS, 3(4), 21-22.

Dasgupta, A., Bandyopadhyay, L. and Das, M. (2014). Effectiveness of health education in terms of knowledge acquisition of first-aid measures among school students of a rural area of West Bengal. Med. Res. Chron., 1 (2), 84-91. Available at: www.medrech.com.

Feng, L., Sheng, X., Zhang, J., Jiang, F. and Shen, X. (2014). Effects of pediatric first aid training on preschool teachers: a longitudinal cohort study in China. BMC Pediatr. 14: 209. doi: 10.1186/1471-2431-14-209.

Hirca, N. (2012). Does teachers' Knowledge Meet First Aid Needs of Turkish Schools? Review of Turkish Literature. Journal of European Education, 2(2): 15-23.

International Federation of Red Cross and Red Crescent Societies [IFRCS]. International first aid and resuscitation guidelines. Geneva, 2011.

International Federation of Red Cross and Red Crescent Societies [IFRCS]. First aid for a safer future: focus on Europe. Paris: French Red Cross, 2009.

Jabbour, KK. (2013). AN exploratory study of the critical need for school health programs in Lebanon. BJSEP. 7(2): 264-279.

Li, F., Jiang, F., Jin, X., Qiu, Y., and Shen, X. (2012). Pediatric first aid knowledge and attitudes among staff in the preschools of Shanghai, China. BMC Pediatrics, 14(12):121.

Markenson, D., Ferguson, JD, Chameides, L et al. (2012). Part 17: first aid: 2010 American Heart Association and American Red Cross guidelines for first-aid. Circulation, 122 (Suppl 3): S934-S946.

Markenson, D., Ferguson, JD, Chameides, L et al. (2010). Part 13: first aid: 2010 American Heart Association and American Red Cross International Consensus on first-aid science with treatment recommendations. Circulation, 122 (Suppl 2): S582-S605.

Maloti, DK. (2006). Effectiveness of planned teaching programme on knowledge regarding first aid in selected conditions among primary school teachers working at schools at B.K. Nagar, Bangalore. Community Medicine Dept. M.S. Ramaiah Institute of Nursing Education and Research, 1-130.

Martin, IG. and Jolly, B. (2002). Predictive validity and estimated cut score of an objective structured clinical examination (OSCE) used as an assessment of clinical skills at the end of the first clinical year. Med.Educ. 36:418-425.

Masih, S., Sharma, RK. And Kumar, A. (2014). Knowledge and practice of primary school teachers about first aid managemet of selected minor injuries among children. International journal of Medicie and Public Health. 4(4): 458-462. doi: 10.4103/2230-8598.144114.

Meissner TM, Kloppe C, Hanefeld C. (2012). Basic life support skills of high school students before and after cardiopulmonary resuscitation training: A longitudinal investigation. Scand J Trauma Resusc Emerg Med. 20:31. doi:10.1186/1757-7241-20-31.

Olympia RP, Wan E, Avner JR. (2005). The Preparedness of schools to respond to emergencies in children: a national survey of school nurses. Pediatrics, 116: e738-e745.

Plant N, Taylor K. (2013). How best to teach CPR to schoolchildren: a systematic review, Resuscitation, 84(4):415–421.

Perera, L. and Molligoda, H. (2014). Knowledge and Practices Regarding First Aid among School Teachers in the Kurunegala Zonal Educational Division. Proc. KDU International Research Conf. on expanding development horizons through education, research and innovation. Ratmalana Sri Lanka, 125-132. Available at: www.kdu.ac.lk.

Reveruzzi, Bianca, Buckley, Lisa, Dingli, Kelly, Chapman, Rebekah L., Sheehan and Mary C. (2013). School-based first aid training and the implications for traffic injury prevention: a randomised controlled trial. In International Traffic Medicine Association 23rd World Congress, 19 - 22 May.

Singletary EM, Zideman DA, De Buck EDJ, Chang WT, Jensen JL, Swain JM, Woodin JA, Blanchard IE, Herrington RA, Pellegrino JL, Hood NA, Lojero-Wheatley LF, Markenson DS, Yang HJ. (2015), on behalf of the First Aid Chapter Collaborators. Part 9: first aid: 2015 International Consensus on First Aid Science with Treatment Recommendations. Circulation, 132(suppl 1):S269–S311. Available at http://circ.ahajournals.org DOI: 10.1161/CIR.0000000000000278.

Schünemann H, Brożek J, Guyatt G, Oxman A. (2013), GRADE Handbook. Available at: http://www.guidelinedevelopment.org/handbook/.

Touré, B., Léye Benoist, F., Faye, B., Kane, AW., and Kaadioui, S. (2011). Primary School Teachers' Knowledge Regarding Emergency Management of Avulsed Permanent Incisors. Journal of Dentistry, Tehran University of Medical Sciences, 8(3): 117-122.

Van de Velde S, Heselmans A, Roex A, Vandekerckhove P, Ramaekers D, Aertgeerts B. (2009). Effectiveness of nonresuscitative first aid training in laypersons: a systematic review. Annals of Emergency Medicine, 54(3):447-57.

Van de Velde, S., Broos. P., Bouwelen, MV., et al. (2007). European first aid guidelines. Resuscitation, 72: 240-251.

Wafik, W. and Tork, H. (2014). Effectiveness of a first-aid intervention program applied by undergraduate nursing students to preparatory school children. Nursing. Nursing and Health Sciences, 16, 112-118. doi: 10.1111/nhs.12083.

Wesam, M. (2014). Assessment of first aid knowledge among school instructors in AL-Madinah AL-Munawarah city, Saudi Arabia, Proc. 6th scientific conference for male and female students, Higher Education, Makka. Available at: https://prezi.com/fz0leqy1eia9/copy-of/?