ORIGINAL ARTICLE

Comparison of CPR training by social media networks and workshop on CPR skill of nursing and midwifery students

SARA GHORBANI[1], MANSOUR GHAFOURIFARD[2], MOHAMMADREZA DINMOHAMMADI[3], RAMEZAN FALLAH[4], ALI AGHAJANLOO[5]*

[1]*MSc. Department of Critical Care Nursing, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran & Education Development Center, Zanjan University of Medical Sciences, Zanjan, Iran*

[2]*Assistant professor of Nursing, Department of Medical Surgical Nursing, School of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran*

[3]*Associate Professor of Nursing, Department of Emergency and Critical Care Nursing, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran & Education Development Center, Zanjan University of Medical Sciences, Zanjan, Iran*

[4]*Assistant Professor of Biostatistics, Department of Epidemiology and Biostatistics, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran*

[5]*Ph.D Student of Nursing Education, Critical Care Nursing Department, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran & Education Development Center, Zanjan University of Medical Sciences, Zanjan, Iran*

Correspondence to Ali Aghajanloo, Email: aliaghajanloo2001@yahoo.com Phone numbers: +98 (21) 66421685

ABSTRACT

Background: Social medias are becoming the most important tool that students can create and share information and knowledge. This study aimed to compare the effect of social media and workshops on CPR skills of nursing and midwifery students.

Methods: In this quasi-experimental study, 59 nursing and midwifery students were randomly divided into WhatsApp-based and workshop-based training groups. CPR skills were assessed at four time-points, including before the training, one week, one month and three months after the training. Data were analyzed using descriptive statistics and Generalized Estimating Equation (GEE) by SPSS 16 software program. The significance level was considered as 5%.

Results: Before the training, both groups had low scores. However, the results showed that one week, one month and three months after the training, the mean score of CPR skill in the WhatsApp group was statistically lower than the workshop group ($p<0.001$).

Conclusions: Despite the effectiveness of both methods, the workshop had more effect on students' skills. Therefore, it seems that social media should not be considered a substitute for conventional training, such as the workshop.

Keywords: Cardiopulmonary resuscitation (CPR), nurse, midwife, student, social media network, workshop.

INTRODUCTION

Cardiac arrest is a major public health issue accounting for 15-20% of all deaths[1,2]. The initiation of optimal cardiopulmonary resuscitation (CPR) by health care providers could help more people to survive[3]. The CPR is considered as a vital procedure at which all health care providers need to be skillful in this field[4]. Since nurses are commonly first responders in hospital settings, they need to have sufficient knowledge and skills on CPR[5]. Therefore, CPR training is an essential component of the undergraduate curriculum in different fields of healthcare disciplines to prepare students for their careers in the future[6]. The literature review shows that improvements in CPR training could help students to improve their CPR knowledge and performance[7-10].

Based on developments in information and communication technologies (ICTs), there is now a new perspective on learning and teaching methods[11]. Today, e-learning approaches and interactive multimedia are suggested for students' learning[12]. For this, some capabilities of smartphones, such as social media networks, could be used for e-learning. Social media networks as an interactive smartphone-mediated facility can be used to share information between students, share ideas with other students, share personal academic interests, engage students in education and understand what they are thinking about during the education, create an effective study group, and enhance functions of e-textbooks through connecting students with social media for collaborative purposes[13]. In fact, by using social media networks, students can take more responsibility for their learning, learn in their own pace and in their own time, access a massive pool of knowledge, communicate and share their experiences and ideas with their teachers and peers in a format of articles, videos, picture, and so on; All of these activities could help them to improve their learning experiences[11].

Recently, smartphone-based education has been recommended to be utilized in different areas of medical education[14-17]. It helps to provide a flexible and self-directed learning environment for users. Furthermore, learners could access information and skills without any time and space constraints[18]. The students may come under pressure when they learn and practice procedures in a classroom or skill lab. However, the provision of a safe and non-judgmental learning environment through smartphone-based education could help students to practice many times with no time constraint and without concern about making errors[15]. The cost-effectiveness of using electronic technology in the delivery of health education has also been documented in the medical literature[19].

According to the literature review, different teaching and methods have been proposed for the developing of

CPR skills among students in various fields of healthcare professionals. These methods include watch-and-practice technique[20], video training[9,10,21-14], CPR feedback device and manikin[25], simulation[3,26], Automated audiovisual feedback[27], Peer-assisted Education[28], Virtual Simulation Game[7], Blending Teaching[29], and workshop[30]. Although there have been proposed many methods for CPR training, to the best of our knowledge, there is no study relating to the effect of social media training on CPR skills among students. Moreover, the efficacy of social media training has remained unknown as compared with other training methods. Therefore, the present study aimed to investigate the effect of social media education on CPR skills in nursing and midwifery students and to compare it with the workshop method.

MATERIAL AND METHODS

Study design and setting: This is a quasi-experimental study conducted using a pretest-posttest design. The research setting was the School of Nursing and Midwifery of Zanjan University of Medical Sciences. Based on the results of a previous study[31], a total of 26 samples for each group were enrolled. By considering the possible attrition rate, a total of 83 nursing and midwifery students were enrolled in the study and finally 59 samples completed the study (Fig. 1).

Second-year nursing and midwifery students who had no CPR experience, having no participation in similar courses on CPR, and having a smartphone to install WhatsApp Messenger as a social network participated in the study.

Nursing and midwifery students were assigned into two groups. Nursing students received WhatsApp-based training, and midwifery students received workshop-based training. We asked both groups not to share their knowledge and materials.

The nursing students received CPR training using the social network software (WhatsApp Messenger), and the midwifery students received the same contents by using the workshop method. In the WhatsApp-based group, students were first asked to install WhatsApp Messenger. Then, the primary researcher created a new channel, added the students to the channel, and provided the information and explanations on the responsibility of the students. The CPR training topics were then uploaded on the channel over a week. Students' activities and behaviors in the network were monitored continuously by the researcher. Moreover, the researcher provided the feedback on the students' activities and answered their questions. In the workshop-based training group, CPR training was conducted using a 3-hour educational workshop. The contents of education for both groups were based on American Heart Association (AHA) CPR guidelines and included the history of CPR, the chain of survival, cardiac arrest, CPR sequences, and information on how to use an automatic external defibrillator (AED).

Data collection: Data were collected at four time-points, including before the training, one week, one month, and three months after the training. Data collection tools consisted of the following: (a) Demographic questionnaire and (b) a researcher-made checklist of CPR-skill assessment. The demographic questionnaire consists of the following variables: age, gender, marital status, and clinical work experience. The checklist of CPR assessment was developed based on a literature review and the latest AHA guidelines for CPR. The checklist consisted of 20 items. Each item was scored from 0 to 2 as 0=incorrect action, 1=poor ation, and 2= correct action. The total score was the sum of scores of all items ranging from 0 to 40. The higher scores show the higher skill of students.

The same method was used for assessment of students' skills in performing CPR. All assessments were done at the skill lab by the primary researcher. The students were asked to do CPR on the manikin, and then the evaluator filled the checklist based on the students' performance. All assessments were taken by the primary researcher who had a certificate in the CPR.

Ethical Considerations: The Ethics Committee (IR.ZUMS.REC.1398.237) approved the present study. Students were assured of the confidentiality of the information collected. Furthermore, written informed consent was obtained from all participants before enrolling them in the study. They were also free to withdraw from the study at any time.

Data Analysis: The data were entered into SPSS 16.0; and analyzed using descriptive and inferential statistics. The descriptive data were presented using mean, standard deviation, and percentage. Moreover, a statistical analysis such as independent t-test and Generalized Estimating Equation (GEE) were used to compare the mean scores of the two groups and determine the training effect over time. The significance level was set at $p<0.05$.

RESULTS

The mean age of the participants in the WhatsApp and workshop group was 20.9±2.64 and 19.77±1.21, respectively; there was no statistically significant difference between the two groups in this regard ($p> 0.05$). All participants in the two groups were single. Both groups were comparable in terms of age, marital status, and having no experience in CPR. All of the participants in the workshop-based training group were female (n=27), and 63% (n=20) of the participants in the WhatsApp group were male. Moreover, none of the participants had CPR training courses in the past.

Before the training, the students in both of the groups had merely a limited skill about CPR. Before the training, the mean scores in the WhatsApp- and the workshop group was 1.71±1.95 and 2.07±2.46, respectively. The results showed that the mean scores were similar between the two groups and there was no statistically significant difference between the two groups in the mean scores before the training ($p=0.54$). However, the mean scores in the WhatsApp (27.09±7.52) and the workshop (34.37±5.56) groups showed a statistically significant difference one week after the training ($p=0.001$). One month after the training, the mean score in the WhatsApp-based training group was 31.12±6.07, and in the workshop-based training group was 36.11 ± 2.83; these values were statistically significant ($p=0.001$). Moreover, there was a significant difference between the mean score in the WhatsApp

(31.21±5.76) and workshop (35.25 ± 3.30) groups at the point of three months later (p=0.001) (Table 1).

The results of the GEE test demonstrated that by controlling confounding variables, the mean score in the workshop-based training group was 5.5 points higher than in the WhatsApp-based training group at three time points after the training. These differences were statistically significant (p=0.001) (Table 2).

Table 1. Comparison of the mean score of CPR skill in workshop and WhatsApp groups

Variable	Group		P-value
	Workshop group(n=27) Mean±SD	WhatsApp group (n=32) Mean±SD	
Pretest (T0)	2.07±2.46	1.71±1.95	0.54
Week 1 (T1)	34.37±5.56	27.09±7.52	0.001
Month 1 (T2)	36.11±2.83	31.12±6.07	0.001
Month 3 (T3)	35.25±3.30	31.21±5.76	0.001

Table 2. Generalized estimating equation (GEE) analysis of longitudinal outcome of the CPR skill among workshop and WhatsApp groups.

Variable	GEE (Interaction between time and groups)					
	β	SE	95%CI		Wald X2	P-value
			Lower	Upper		
Intercept	45.534	6.5549	32.686	58.381	48.254	0.001
Group (WhatsApp vs. workshop)	-5.539	1.0718	-7.640	-3.438	26.707	0.001
Gender (WhatsApp vs. workshop)	0.734	1.227	-1.670	3.139	0.358	0.53
Age (WhatsApp vs. workshop)	-.541	.2982	-1.125	.044	3.286	0.70
Pretest (WhatsApp vs. workshop)	-.085	.1844	-.446	.277	.210	.647

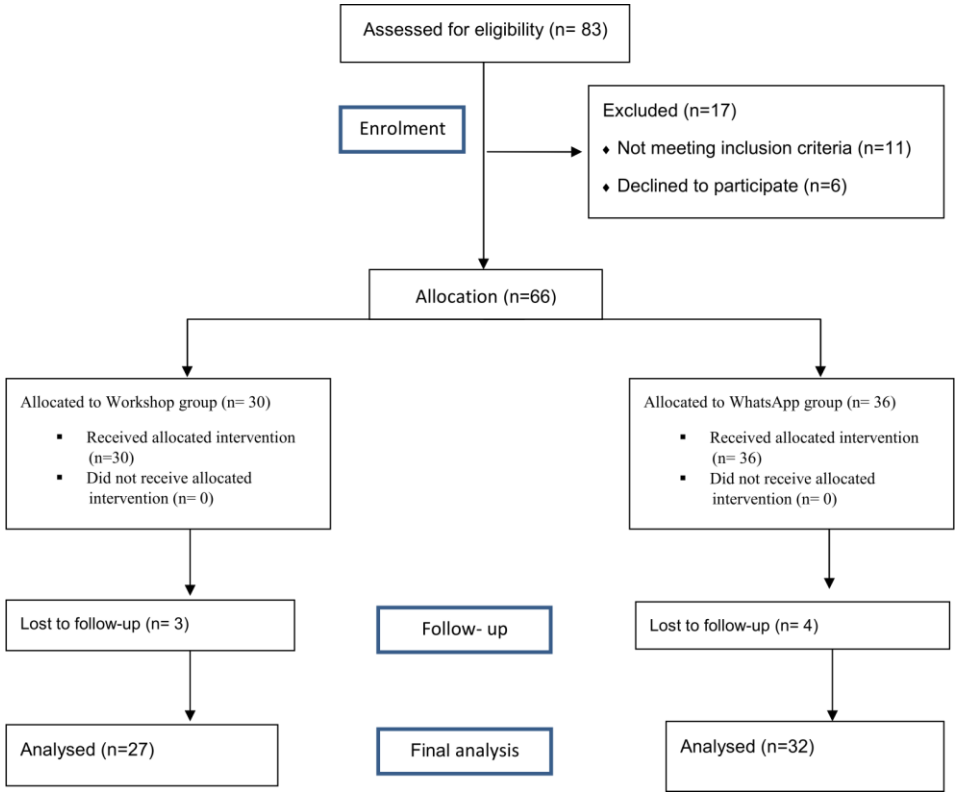

Fig 1: Research process

DISCUSSION

The results showed that students' skills to perform CPR increased significantly among both groups after the training. However, the mean scores of CPR skills in the workshop group were higher than the WhatsApp group in three time points, and this difference was statistically significant. This result is in line with a study done by Rehberg et al. (2009) that the findings indicated that CPR training based on the computer did not develop the quality of CPR performance as compared with traditional classroom-based training [32]. They concluded that computer-based CPR education could be a possible facility for training of lay rescuers, but is not a suitable method for CPR training in health care professionals.

The results showed that social media such as WhatsApp is not alone an effective method for training of

CPR; this result is not in line with other studies[33,34]. In a quasi-experimental study, Zia Ziabari et al. (2019) allocated 100 medical interns who have completed the emergency medicine course into two groups. One group received distance education by Telegram software for three consecutive months, and the other group did not receive any education in the field of CPR. The results showed that the mean score of basic life support (BLS) awareness among the telegram group was significantly higher than in another group. A probable reason could be that they evaluated the effect of social media training on CPR knowledge, but we evaluated CPR skills. Tobase et al. (2017) showed that the online course was an effective method for teaching and learning BLS skills[34].

Nord et al. (2016) compared the influence of 30 min mobile application-based and the 50 min DVD-based on students' skills in CPR. After six months follow-up, the DVD-based group showed significantly better performance in CPR skills compared with the app-based group[35].

According to the literature review, there is no consistency in the studies in the field of CPR training. A probable reason could be related to the diversity in the teaching methods, sample size, location, and research designs. In another study, Ahn et al. (2011) showed that sending a reminder phone message to watch the CPR training videos can be useful in improving the retention of CPR skills[36]. They concluded that sending a reminder video clip by mobile phone could have a good influence on the retention of skills among lay responders. It seems that mobile-based education could be effective in the lay responders. Moreover, it alone is not a suitable method for improving CPR skills, but it could be used as an adjuvant method for CPR training.

According to the results of our study, students in the workshop group showed a better performance compared with social media training. Reder et al. (2006) believe that CPR skills are a set of hard psychomotor skills and actions that needs hands-on practice. They argue that computer-assisted training only could be useful for explaining the series of actions needed for CPR skills, not for CPR practices[37].

It seems that computer-based and mobile-based education improves cognitive skills. Therefore, since the CPR skills need psychomotor skills, it requires face-to-face and practical training.

Limitations: The present study is the first study that examined the effect of social media on CPR-skill and provided more information on this area. However, the study has some limitations. The limitations of the present study consisted of the following: Small sample size, the impossibility of random allocation, and the lack of blinding. Furthermore, all students in the field of the midwifery in Iran are female. Therefore, all participants in the workshop group were female, and this could be considered as a limitation.

CONCLUSION

Based on the results of the present study, it was found that despite the effectiveness of both WhatsApp- and workshop-based CPR training methods on CPR skills, workshop-based training had a better effect on students' performance. Therefore, it seems that the workshop is recommended as an effective method for CPR training. In conclusion, mobile-based CPR training using social media networks should not be considered a substitute for conventional training such as the workshop. Rather, social media networks can be used as an adjuvant method with other teaching methods by considering the limitations of educational facilities and the advantages of social media training, including cost-effectiveness, timelessness, generality, user-friendliness, etc. These findings help the medical educators for selecting the appropriate method for teaching the CPR. Therefore, the evaluation of the combination of social media training and other teaching methods is recommended for future studies.

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