

Impact of Continued Social Network-based Learning Based on Midwives Knowledge and Implementation of the Helping Babies Breathe Program

Abstract

Background: The Helping Babies Breathe (HBB) program is a simple neonatal resuscitation protocol implemented in low-resource clinical systems. Therefore, it is necessary to train midwives on the implementation of this program and ensure the sustainability of the learned materials. The present study aimed to assess the impact of continued social network-based learning based on midwives knowledge and implementation of the HBB program. **Materials and Methods:** This randomized controlled field trial was performed on 50 midwives who were selected by the available sampling method. All midwives attended the HBB workshop; thereafter, in the intervention group, the learned materials were reinforced for 3 months using WhatsApp messenger. Data were collected using Objective Structured Clinical Examination (OSCE), which was administered before the HBB program and 3 months later (HBB guide; 2th Ed, 2018). The data were analyzed in SPSS software (version 19) using independent and paired t-tests. **Results:** Based on the results, the mean knowledge score was not significantly different in both groups (control and intervention) immediately after the workshop. The mean scores of knowledge and skill variations did not decrease significantly in the WhatsApp group during the 3 months; nonetheless, a marked decrease was observed in the control group ($t_{21} = 16.68, p < 0.05$). **Conclusions:** The results of this study pointed out that continued social network-based education promoted the knowledge and skills of health care providers, highlighting the importance of social networks in education.

Keywords: *Helping babies breathe, infant, knowledge, learning, newborn, resuscitation, social networking*

Introduction

Birth asphyxia is one of the major perinatal problems which caused 1 million neonatal deaths annually.^[1] Approximately 10% of new-borns need some assistance to start breathing well after birth, and about 1% of them require extensive resuscitative measures to survive.^[2] About 30% of neonatal resuscitation procedures are not performed, or resuscitation is not carried out properly.^[3,4] One of the barriers posed to neonatal resuscitation is the complicated methods used to adopt this procedure. To tackle this problem, the American Academy of Pediatrics has proposed a simplified method of neonatal resuscitation curriculum called Helping Babies Breathe (HBB).^[2] It seems that the simplicity of this method has encouraged its implementation in society; therefore, more neonates worldwide can benefit from resuscitation services.

The HBB relies on the golden minute when it is vital to stimulate breathing and use bag-and-mask ventilation (Ambu bag). The presence of at least one person trained in resuscitation is required during every delivery. It is worth noting that resuscitation training should be based on facts, skills, attitudes, and appropriate teaching methods and aids (mannequin and moulage). Furthermore, the elusive nature of educational materials in the field of resuscitation is one of the problems presented to health workers. Therefore, their knowledge and skills should be improved through continuous and appropriate training over time.^[5] Numerous studies have been conducted to find more effective educational methods in neonatal resuscitation. It is worth mentioning that one of the major concerns of these studies is to ensure the maintenance of learned knowledge and skills over time.^[6-8] New teaching

Seyyed-Mohammad Reza Hosseini¹,
Reza Naghdi²,
Zahra Atarodi-Kashani³,
Gholamreza Sharifzadeh⁴,
Ferdows Bameri⁵

¹Department of Emergency Nursing School of Nursing and Midwifery, Birjand University of Medical Sciences, Birjand, Iran, ²Msc Emergency Nursing, Department of Emergency Medical Services, Kerman University of Medical Sciences, Kerman, Iran, ³Department of Nursing and Midwifery, Assistant Professor, Iranshahr University of Medical Sciences, Iranshahr, Iran, ⁴Department of Epidemiology and Biostatistics, School of Health Social Determinants of Health Research Center, Birjand University of Medical Sciences, Birjand, Iran, ⁵Msc Emergency Nursing, Iran Hospital, Iranshahr University of Medical Sciences, Iranshahr, Iran

Address for correspondence:
Mr. Ferdows Bameri,
Iranshahr University of Medical Sciences, Iran Hospital,
Sistan and Baluchestan, Iran.
E-mail: nurse2012b.ferdows@gmail.com

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methods, including problem-solving, group discussion, cooperative teaching model, e-learning, clinical education, and evidence-based medicine, have been effective in the enhancement of learning.^[9] Researchers believe that all instructional methods lead to learning; however, the depth and stability vary in different teaching methods.^[6-10] In this regard, the results of one study showed that after watching videos of real resuscitation, the quality of resuscitation performance of the learner improved the short-term outcomes of resuscitation (e.g., resuscitation time, Apgar, pulse return, and the neonate's skin color during resuscitation), in comparison with resuscitation workshops using mannequins. Nevertheless, the resuscitation performance in these two educational methods was not significantly different.^[10] Also, the results of a study by Borhanzahi *et al.*^[11] suggested that the use of workshops and WhatsApp messenger for training were effective in nurses' electrocardiogram (ECG) interpretation skills. However, nurses in the WhatsApp group obtained higher skill scores as compared to their peers in the workshop and control groups.

Given that midwives are the first medical personnel in contact with neonates in need of resuscitation, their education is of paramount importance. Moreover, the distance, wide distribution of midwives workplaces, travel risks, and the high costs of holding retraining courses and repeating training impose serious limitations on their training. Therefore, it is of utmost importance to find a reliable method for the maintenance of the learned instructional materials. In light of the aforementioned issues, the present study aimed to assess the impact of continued social network-based learning based on midwives knowledge and implementation of the HBB program.

Materials and Methods

This randomized controlled study was conducted on 50 mid-wives working in maternity facilities of Iranshahr University of Medical Sciences from November to February 2019. The participants were selected by the available sampling method. The sample size was calculated at 25 cases based on a study by Seto and the formula for comparing the means (a 95% confidence interval and 80% test power).^[7] Since many deliveries still take place outside the hospitals and HBB is a simple program with minimal equipment, the midwives in maternity facilities were selected as the target group. The instruments of the present study contained a HBB questionnaire and three OSCEs [OSCE Bag-Mask Ventilation (BMV), OSCE A, and OSCE B].

The questionnaire contains 18 four-option items. Furthermore, the following tests were administered to the learners: BMV test, including four items (choosing the right instrument, starting Bag-Mask ventilation, maintenance of ventilation, and improved ventilation), OSCE A, which consisted of 12 questions and 4 items on essential term

neonate care (preparation for birth, initial and necessary measures for newborn care, management of neonatal apnea, care for spontaneously breathing neonates), and OSCE B, which contained 23 questions and 7 items on essential preterm neonate care (preparation for birth, care for neonates with apnea, provision of essential care in the Golden Minute, Care for neonates with resistant apnea, corrective measures for the neonate during BMV, proper ventilation criteria, care of the neonate with a normal heart rate, and breathing after ventilation) (HBB guide; 2nd Ed, 2018).

The inclusion criteria were as follows: obtaining a score of at least 9 out of 12 in OSCE A, 17 out of 23 in OSCE B, a complete score (14 points) in the BMV test immediately after participation in the HBB program workshop, midwives with a college education, and midwives who had access to the Internet and WhatsApp messenger. On the other hand, the subjects in the intervention group who did not receive and study 50% of the submitted materials were excluded from the study. After obtaining the code of ethics and the approval of the Vice-Chancellor for Health Affairs of Iranshahr University of Medical Sciences, the information of the midwives of the maternity facilities was collected. Necessary coordination was made with the participants via phone; thereafter, they completed the two forms of informed consent and demographic characteristics.

To assess the midwives knowledge, the HBB Questionnaire was administered to all participants who attended the HBB workshop. Following that, immediately after the workshop, the knowledge and skills of midwives were evaluated using the tools in the HBB training package; subsequently, the subjects were randomly assigned to two groups: intervention and control. In the intervention group, the contents of the educational workshop were reviewed twice a week for 3 months by the researcher in the form of short texts, WORD, PDF, POWER POINT files, images, short videos, and podcasts via WhatsApp messenger. It is noteworthy that the group members who did not receive, view, or read the new message were privately reminded. No intervention was performed for the control group during the 3 months. Three months after the workshop, the learning sustainability was assessed using the knowledge and skill assessment tools in the HBB training package. In adherence to ethical principles, a training session was held for the control group after the end of the post-test. Two subjects were excluded from the intervention group (one person did not participate in the post-test and one person left the social network group during the intervention), and three cases were ruled out of the control group (they did not participate in the post-test). Data were analyzed in SPSS (version 19; SPSS Inc., Chicago, Illinois) using descriptive statistics, paired *t*-test, and independent *t*-test.

Ethical considerations

The present article was extracted from a Master's thesis in Emergency Nursing approved by the Research Ethics

Committee of Birjand University of Medical Sciences and Health Services (Ethical code: IR.BUMS.REC.1398.211). All participants participated voluntarily in the study and signed informed consent to do that.

Results

There was no statistically significant difference between the two groups in terms of variables, such as age and work experience. The subjects were divided equally between the two groups [$t_{43} = -0.98, p > 0.05, t_{43} = -0.25, p > 0.05$; Table 1]. There was no statistically significant difference between the two groups in the mean score of the HBB program knowledge in the pre-test ($p = 0.20$). In the post-test stage, the two groups did not significantly differ in mean knowledge score ($p = 0.18$). Nonetheless, the mean score of knowledge variation was significantly different between the two groups ($p = 0.04$). Although the mean knowledge score decreased over time in the WhatsApp group, this decrease was not statistically significant ($df = 22, p = 0.25$). Nonetheless, the mean knowledge score decreased over time in the control group, and this decrease was statistically significant [$df = 21, p < 0.001$; Table 2].

The mean post-test score of the HBB skill in the two groups was significantly lower than the mean score obtained in the pre-test. However, the mean post-test score of the skill level and the mean score of skill variations were significantly different between the two groups. Moreover, the mean post-test score of skill level was significantly higher in the WhatsApp group, as compared to that in the control group [$p < 0.05$; Table 3].

Discussion

This study was conducted in maternity facilities where caregivers could practically face the resuscitation of a real neonate. Given that the HBB has newly emerged, the

American Association of Pediatrics and the Department of Neonatal Health are striving to encourage the use of this program, even among ordinary people in the community. This indicates the need to consider this issue; therefore, selecting an appropriate method in terms of effectiveness and motivation is essential. The present study aimed to investigate the possibility of using social networks to maintain the learned materials in HBB training and determine the effectiveness of continued social network-based training on the sustainability of HBB training.

The results of the present study demonstrated no statistically significant difference between the intervention and control groups in terms of post-test knowledge; nonetheless, the mean post-test score was higher in the intervention group as compared to that in the control group. The two groups were statistically significantly different in the mean scores of variations between the pre-test and post-test, signifying the effectiveness of the continuity of theoretical social network-based training. Along the same lines, the findings of a study by Eun-Hi Kong *et al.*^[12] indicated that in the web-based group, the mean score was higher after the intervention as compared to that before the intervention, and the difference was statistically significant. The present study put an emphasis on the impact of internet-based education on learning. It is worth noting that the sustainability of social network-based learning was investigated in the present study.

In agreement with the results of the present research, the findings of most studies have been indicative of the positive effect of education on the enchantment of awareness and performance of health personnel as well as parents' care awareness. For instance, the results of a study by Bagheri *et al.*^[13] suggested that the improvement of the knowledge score of nulliparous couples had a statistically significant effect on neonatal care after the training sessions. Nonetheless, despite the altered care needs of the growing infants, these training programs were not continued. In the same context, the results of a study by Saeidi and Gholami^[14] demonstrated that the mean post-test knowledge scores improved in the two educational groups (neonatal resuscitation training based on simulation method and traditional education). However, they were significantly different, and education based on simulation was more effective than traditional training.

Moreover, the results of the present study pointed to a statistically significant difference between the two groups

Table 1: Mean scores of age and work experience of the two groups

Variables	Age (year) Mean (SD)	work experience (year) mean (SD)
WhatsApp group	29.20(3.40)	5.40(2.90)
Control group	30.30(4.20)	5.60(3.60)
<i>p</i>	<i>t</i> =-0.98 <i>p</i> =0.33	<i>t</i> =-0.25 <i>p</i> =0.80

Table 2: Comparison of mean scores of the helping babies breathe program knowledge level between the two groups before and after the intervention

Groups	Pre-test knowledge mean (SD)	Post-test knowledge mean (SD)	<i>p</i>	Changes between before and after the intervention mean (SD)
WhatsApp group	17.13(0.86)	16.6(51.26)	<i>p</i> =0.25	0.47(1.27)
Control group	17.45(0.80)	16.18(1.05)	<i>p</i> <0.001	1.27(1.31)
<i>p</i>	<i>t</i> =-1.30 <i>p</i> =0.20	<i>t</i> =1.35 <i>p</i> =0.18		<i>t</i> =2.05 <i>p</i> =0.04

Table 3: Comparison of mean scores of the helping babies breathe program performance level between the two groups before and after the intervention

Groups	Pre-test Skill Mean (SD)	Post-test Skill mean (SD)	t/p	Changes between before and after the intervention mean (SD)
WhatsApp group	44.17(1.69)	38.95(5.06)	t=4.74 p<0.001	-5.21(5.27)
Control group	45.22(1.06)	28.54(5.45)	t=16.68 p<0.001	16(5.17)
p	t=-2.48 p=0.01	t=6.63 p<0.001		t=7.00 p<0.001

in terms of post-test skill scores as well as variations between pre-test and post-test scores. This demonstrates the effectiveness of continuity of skill and performance training based on social media. In this regard, the results of some studies pointed out that the knowledge and skill scores of health care providers in resuscitation and care of term and pre-term neonates are maintained and improved after in-person training and consecutive reminder sessions.^[6,7] It should be noted that the aforementioned studies placed emphasis on learning sustainability through in-person training and support the hypothesis that more practice is needed to achieve and maintain resuscitation skills. Nevertheless, the present study shifted the focus on the sustainability of social network-based learning, especially in the current coronavirus disease 2019 (COVID-19) epidemic, which has obliged most educators to shift away from in-person to virtual education. The results of a study by Seto *et al.*^[7] suggested that face-to-face training in the HBB program increased knowledge and skills. The findings of the present study pointed to a marked decrease in the mean post-test knowledge and skill scores of the two groups. However, this decrease was less pronounced in the intervention group than in the control group. Moreover, the mean scores of knowledge and skill variations were significantly different between the two groups. The knowledge and skills were preserved to some extent in the intervention group (based on social networks). The study by Seto (simulation-based and face-to-face education) and the present research (based on social networks) assessed the effect of two different educational methods on learning sustainability. The increased and maintained knowledge and skills in the study by Seto can be attributed to face-to-face training.

The results of some studies, such as Cheung *et al.*,^[15] on the effect of using social networks on improvements in knowledge and skills illustrated that education and transfer of information through WhatsApp messenger were more effective in quitting smoking, as compared to knowledge transfer through Facebook. In line with the findings of the present research, the results of the study by Martinez *et al.*^[16]

suggested that data transfer through WhatsApp messenger improved the quality of burn care in children.

WhatsApp Messenger is one of the least expensive, most accessible, and most widely used social networks which facilitate teacher–learner communication. Therefore, this WhatsApp messenger is suggested for workshops, especially in clinical disciplines with rotating shift work schedules, making it difficult to attend classes and workshops. Moreover, this messenger can significantly help the current COVID-19, especially in deprived areas where it is impossible to participate in enclosed places for public face-to-face training. This educational method enables learners to easily receive educational materials in the form of text, podcasts, and images in their free time without any haste, fatigue, and worries. In addition, educational officials answer their questions appropriately and provide them with constructive feedback. Considering the comparable results of virtual education and face-to-face training, it is suggested that future studies compare and assess the effect of continued social network-based education with face-to-face training on the sustainability of learning and the promotion of knowledge and skills.

Among the notable limitations of the present study, we can refer to the sampling method and the organization of workshops on 3 consecutive days due to the limited number of midwives, the possibility of information leakage, previous knowledge and experiences in neonatal resuscitation, and midwives motivation in accepting and learning the educational program.

Conclusion

As evidenced by the obtained results, the continuity of HBB training based on WhatsApp messenger led to the retention of knowledge and skills in midwives. This finding highlights the importance of social networks as an educational method for the retention and sustainability of education. Therefore, this new educational method can bring marked improvements in the educational process and other instructional approaches. Furthermore, it was found that it is indispensable to consider effective teaching methods, especially practical training, in order to improve and maintain the quality of primary medical skill training, such as HBB. In this regard, we can refer to the educational method based on social networks and learners’ active participation in education. Given the importance of the

HBB program, it is recommended that researchers assess different instructional methods to empower the medical staff. Moreover, they should examine the retention of this ability in longer periods of time using a variety of target groups and the number of sessions.

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Conflicts of interest

Nothing to declare.

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