

Implementing the First-Aid Education into the College Curriculum in China: The Efficacy Study of the First-Aid Workshop at Wenzhou-Kean University

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Abstract

In the event of an emergency, the timely and appropriate first-aid operations provided by non-medical personnel at the scene of accident before the arrival of medical professionals are crucial to help minimize the frequency in accidental induced deaths and injuries. Thus, it is essential to provide the effective first-aid training to the public. College students are considered to be the ideal candidates due to their excellent learning ability, maturity as well as the strong adaptability. Not as in most advanced countries, little education on the first aid is currently offered in Chinese universities especially those non-medical institutes. To determine the feasibility of introducing the first-aid education into the school curriculum, here we reported the study on the efficacy of the one-day first-aid training at Wenzhou-Kean University (WKU), an American-Chinese joint education institute. The general survey was initially conducted among all the freshman (n = 620) students at WKU to identify their interests as well as demand for the first-aid education. Along with the one-day first aid workshop which included both the lecture and the operation sessions, the pre-post study was performed to evaluate the efficacy of the workshop. The first-aid knowledge and skills as well as social awareness were judged before and after the training among the participants (Pre: n = 95; Post: n = 85). Results demonstrated that more than 95% of students appreciate the importance of first-aid training in universities indicating an extremely high demand. More than 40% students prefer to have the first-aid education as part of their curriculum. It also revealed that students lack professional

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knowledge towards the key first-aid skills such as cardiopulmonary resuscitation (CPR). The pre-post efficacy study suggested that participants' knowledge as well as skills have been significantly improved after the workshop. The correctness rate of objective questions for CPR was raised from 68.4% to almost 100%; For Heimlich method, the accuracy rate was elevated about 2.4 fold. We also surveyed the social awareness among the participants. The ratio of people who are willing to take a leading role in emergency rescue at the accidental site with the absence of medical professionals increased from 11.5% to 23.2%. To conclude, our study indicates that the one-day first-aid workshop not only significantly improved students' skills and knowledge, but also raised their social awareness. Therefore, there is an urgent need to implement first-aid education into the curriculum of WKU and other Chinese Universities.

Keywords

First-Aid, Education, University, Curriculum

1. Introduction

Accidents usually take place unexpectedly and sometimes even pose a threat to people's life safety. If people present on the site of accidents have the first-aid knowledge and skills, they will respond to the emergency appropriately in time which is critical to save lives especially when the non-medical professionals are absent [1]. Sudden cardiac arrest is one of the leading causes of death in the world. It has been reported that cardiopulmonary resuscitation (CPR) performed by bystanders could double or triple the survival rate of the witnessed cardiac arrest accidents [2]. For trauma victims, a study estimated that professional first aid could reduce mortality rate by 1.8% - 4.5% [3]. It has been revealed that people who obtained first aid training usually have more confidence and willingness to perform CPR on strangers than those whom do not have such skills [4]. Therefore, providing professional first aid training to the public is necessary not only to reduce the degree of harmfulness caused by accidents but also to raise the social awareness and responsibility in the society.

First-aid training in college is considered to be one of the best ways with higher efficiency and lower investment cost. College students have relatively high probability of experiencing accidents due to the high frequency of participation in various activities embedded with hidden health problems [5]. College students usually have excellent learning abilities allowing them to master the first aid knowledge and skills quickly. Additionally, first-aid training may help strengthen the prosocial behavior education in college students, which is crucial for them to be social responsible to help others and care for the society. Once college students graduate, they will also play an important role in spreading first aid knowledge and promoting first aid behaviors in the public. It's of great im-

portance for college students to master basic first aid skills and improve their first aid awareness. Only in this way can college students obtain capacities of public first-aid and self-aid.

The popularity of first aid training has been growing rapidly in many European schools over nearly five decades. In Norway, CPR has been a mandatory course in school curriculum since 1961. Influenced by Norway, many other European countries now have well-developed programs or courses to teach CPR in schools [6]. More remarkably in many western countries, the first aid training even starts in primary school where children are only 7 - 13 years old [6]. A telephone survey conducted in 2014 showed that in Norway, of the 1000 interviewees, 895 (nearly 90%) had received first aid training with the median three times [7]. Compared with western countries, China currently has an extremely low popularity of first aid training in colleges. There are three main causes leading to this phenomenon. Firstly, Chances for college students to receive first aid training are rare due to the lack of sufficient support of these training programs from schools Secondly, though there are first aid training seminars in several colleges, many of these training programs are in short of instructors who are medical professionals. Thirdly, due to the low rate of popularity of first aid training, the number of non-medical professionals as well as the trained volunteers in the field is also quite insufficient. In turn, it will make the popularity of first aid training even more challenging. Therefore, it will be urgent to introduce the first aid training into the colleges in China.

In this study, we aim to evaluate the potential of implementing first-aid training program into general education curriculum at Wenzhou-Kean University (WKU). Specifically, the demand and current level of first-aid knowledge among the freshman students were firstly surveyed; Then, the pre-post study of the one-day first aid training workshop was conducted where the efficacy of knowledge as well as skills learning was determined; Finally, the social awareness among students who participated in the workshop was evaluated.

2. Method

2.1. General Questionnaire

Paper questionnaire were used to survey the general interests and demand among all the freshmen students who are from different provinces in WKU. There were 20 questions in the survey mainly focusing on investigation of the aspects as follows: 1) the current level of first-aid knowledge among the students; 2) the importance of first-aid training from students' opinions; 3) the students' interests in first-aid training; 4) and the demand for first-aid training among the students. Questionnaires (620 in total) were divided to 32 groups, each of which was led by 31 mentors who helped the distribution and collection of questionnaires.

2.2. First-Aid Training Workshop Design

The One-day first-aid training workshop was open to all the teachers and stu-

dents at WKU. There were two sessions of the workshop: the three-and-half hour theoretical seminar in the morning and the three-hour practical operation in the afternoon. The morning lecture was given by the professional instructors and the afternoon skill training session was led by several mentors who had prior first-aid training experience. Three main topics delivered in the workshop were CPR, trauma bandaging and the Heimlich method in foreign-body airway obstruction.

The afternoon practical session was operated in small groups. Participants were divided into 12 groups and the operation practice was led by one mentor per group, in which way mentors managed to ensure that each student could master the key skills.

2.3. The Pre-Post Efficacy Study

The pre-post study was conducted at the beginning and end of the first-aid training workshop to evaluate its efficacy. The participants were given pre-questionnaires prior to the morning theoretical seminar, and the post-questionnaires were distributed at the end of the afternoon skill practice session. All questionnaires were conducted anonymously and collected by mentors for each group.

The pre-questionnaires (95 in total) were designed to evaluate the level of first-aid knowledge among the participants prior to the training. Totally 27 sample questions were included in questionnaire. Students' prior experience relevant to first-aid and their intentions to participate in this workshop were surveyed. Then we implemented both the self-assessment module and objective questions to determine the level of their first-aid knowledge. The four-point scale option was set for self-assessment questions to represent the degree of their first-aid knowledge. For example, students were asked "Please evaluate your knowledge of hemostatic dressing skills" (1) Know a little, 2) Know a little bit about theory but don't know how to do it, 3) Learned theory and operation but no practice, 4) Learned theory and operation and can practice). To exclude the possibility that participants may guess or be forced to answer questions, the option of "I don't know" was included for each objective question for the test of first-aid knowledge.

The post-questionnaires (82 in total) were developed to research the following aspects: 1) participants' first-aid knowledge after the training; 2) participants' satisfaction of the workshop and their social awareness. Totally 22 sample questions were included in questionnaire. The same objective questions for the first-aid knowledge test were given as pre-test questionnaire. To effectively test the social awareness among the participants, the five-point scale option was given to make the response more specific. For example, the question was "Are you willing to do first-aid if no medical professionals are present?" The answers were: 1) Not at all, 2) Not very, 3) A little, 4) Very, 5) A lot. Multiple choices were designed to determine the possible concerns among the participants who

may not want to perform first-aid at the site of accidents. We also designed questions to test if participants would like to contribute in popularize first-aid training in the future. Though “Yes/No” was set as initial answer, the choices to find out the specific reason were coupled if they chose “No”.

2.4. The Assessment of Skill Practice

At the end of the training, the trainees were examined their CPR and bandage practice skills. Standard rubric applied in medical universities was used to assess the operations. Each key operation will have the corresponding points. The CPR operation mainly include nine—steps: spot assessment, consciousness judgment, screaming for help, breath scanning, chest compression, airway, artificial respiration, effect evaluation and humanistic concern. Each operation step includes detailed operation guidelines as well as evaluation rubrics. For instance, spot assessment contains two steps to reach, look around for field evaluation and then presentation on “site environment safety”. The former values 1 point, while the latter values 2 points. The total score in CPR is 60 points. Bandage practice mainly evaluates students from three perspectives: preparation, bandage and entirety. The total scores in bandage examination is 40 points.

2.5. Statistics Analysis

The analysis was carried out using Statistical Package for the Social Sciences (SPSS 22) software, general descriptive analysis techniques, the χ^2 test and so on. All P values are two-sided and a $P < 0.05$ was considered to be statistically significant.

3. Result and Discussion

3.1. General Survey on Students' Demand for First-Aid Training

The general survey was conducted among freshman students at WKU with response rate of 100%. Survey indicated that students' demand for first-aid training is quite high, more than 95% of students appreciate the importance of such training in universities. With regard to the current level of first-aid knowledge, it revealed that more than 60% of students have never received any drill training in operations though more than half of the students were educated with the theoretical first-aid knowledge. More than 80% of students can choose the right answer when the question was about the general knowledge such as the “first-aid golden time”. However, there was less than 50% correctness rate when it came to the question related to specific operation skill.

To further identify the possible training modes accepted among students, it indicated that 43.06% of students tend to conduct first-aid training sessions, 33.71% of students are willing to take first aid training as an elective course. For training duration, most students accept half a day (**Figure 1**). Moreover, 50.97% of students choose one class a week, and 38.55% of students choose one class a month.

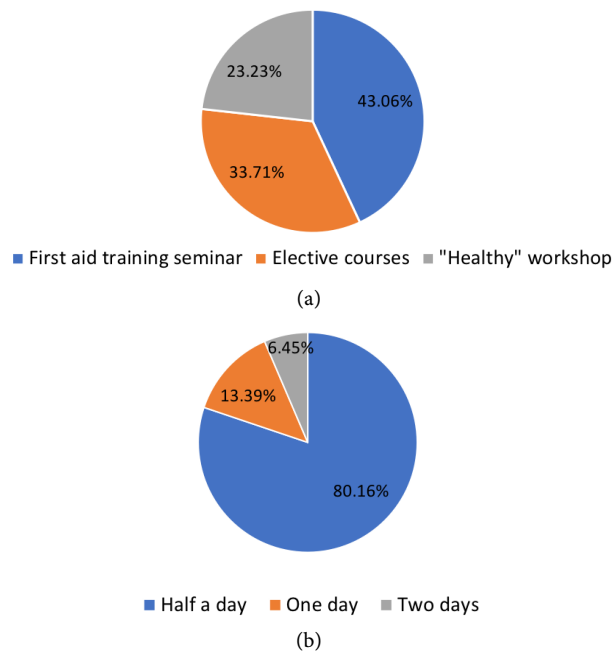


Figure 1. Survey on the preferred mode and length of the training (n = 620). (a) Training model; (b) Training duration.

3.2. Pre-Post Efficacy Study of the One-Day First-Aid Training Workshop

The number of people filling out the pre questionnaire is 95. For the post questionnaire, some students are not present for other reasons, the number of students who fill out the questionnaire is 82. The pre-questionnaire released prior to the first-aid training suggested that many students have a baseline level of the first aid knowledge, which is consistent with findings from the initial general survey. However, they are still in lack of professional knowledge towards specific first-aid skills. It shows that college students have a low awareness rate and correct rate of cardiopulmonary resuscitation (CPR) before training (**Table 1**). There were three main skills including CPR, foreign-body airway obstruction and bandaging and hemostasis delivered through the workshop. Comparison of the correctness rate of objective questions before and after the training, significant improvements in all three skills have been found. The difference was statistically significant ($P < 0.01$). For CPR which was the most familiar skill among the participants, almost 100% correctness rate was achieved for most questions after the training. As for other two skills, the correctness rate of the post-training test was increased by two to three fold. Take the Heimlich for example, the accuracy rate was remarkably elevated from 37% up to 89% after the professional training. The practice operation tests on CPR and hemostasis were conducted on site after the skill practice session. The total score of the test is 100 with CPR and hemostasis accounting for 60 points and 40 points respectively. There were 82 trainees in total who participated in the final practice assessment, the mean score for CPR is 53, and hemostasis is 34.7, and the total mean score is 88 (**Figure 2**).

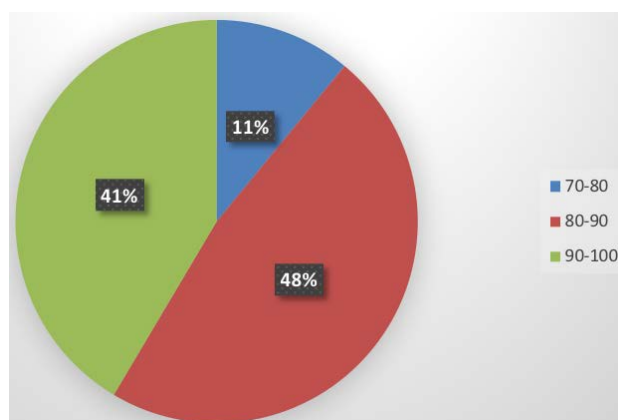


Figure 2. The distribution of operation assessment scores among the participants (n = 82).

Table 1. Comparison of accurate rate before and after training (n = 95 for pre-test; n = 82 for post-test).

Items		Pre-training accurate rate	Post-training accuracy rate	χ^2	P
CPR	Ratio of chest compression to artificial respiration	68.42%	98.78%	28.079	<0.001
	Area of chest compression	65.26%	100%	35.012	<0.001
Foreign-body airway obstruction	First aid for children with foreign body obstruction	18.95%	36.59%	56.848	<0.001
	Heimlich method	36.84%	89.02%	50.383	<0.001
Bandaging and hemostasis	Hemostasis	29.47%	76.83%	39.511	<0.001
	Fracture fixation	26.32%	53.66%	54.099	<0.001
	Trauma care	24.21%	51.22%	13.816	<0.001

The difference was statistically significant ($P < 0.01$).

It shows that around 48% of the participants with scores distributed in the range of 80 - 90 points (**Figure 2**). Moreover, there were 41% of students who obtained score even higher than 90 points.

3.3. Social Awareness and Responsibilities Are Raised among Participants after the First-Aid Training

From our survey, we can also conclude that first-aid training for college students can help improve their prosocial abilities. Before training, when it referred to the willingness to help others, 83.06% of students said that they would assist in first aid in the presence of a professional, and 11.45% of students choose to lead others for first aid without the presence of a professional. After the training, the number of people willing to lead others to participate in first aid is significantly improved. We can see that there are 23.17% students are willing to lead others for first aid without the presence of a professional.

At the end of the post questionnaire, we asked the students about their wil-

lingness to be a teaching assistant, and about 79% students said they are willing to do that. In addition, among the students who choose to be the teaching assistant, 84.6% of them think that first aid skills are very important, so they are willing to popularize it.

To conclude, our survey indicates that majority of students lack professional operational first-aid training even some of them have the baseline level of first-aid knowledge. Also, great interests and demand of the first-aid training are found among college students. Most students do not understand the theoretical knowledge and practical skills of cardiopulmonary resuscitation before training. They have not systematically studied, and the theoretical knowledge and practical skills of cardiopulmonary resuscitation obtained from scattered methods cannot be flexibly applied in practice. However, after the training, college students' understanding of this life-saving technique has been significantly improved, and the awareness and correct rate of theoretical knowledge and practical skills of cardiopulmonary resuscitation have been significantly improved. Significant improvements in three main first-aid skills among participants in the One-day first aid training workshop at WKU suggests that the combination of lecture given by professional instructor with the small group training led by experienced mentors ensures the high efficacy. What's more, the progress in first-aid skills translates into the increase in the social awareness and responsibilities among college students. Our study provides the proof-of-concept to implement the first-aid training in the general education curriculum at universities.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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