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Survey and Analysis of the Cognition of Cardiopulmonary Resuscitation and First Aid Skills among Middle School Students in Guiyang, China

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Retrospective Study

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Abstract

Objective: To understand the knowledge and handling of first aid skills of CPR (cardiopulmonary resuscitation, CPR) in middle school students.

Method: In a cluster sampling of 600 students from randomly selected schools in Guiyang city, the classes were divided into junior and senior levels. The proportion of students in junior and senior middle schools is close to 1:1 and the proportion of boys and girls is also close to 1:1. All the students who volunteered to participate in the survey were investigated by CPR and first aid knowledge questionnaires, then the differences among some characteristics were analyzed after the data checking.

Results: A total of 590 questionnaires were collected, and the recovery rate was 98.33%. 88.16% of students indicated a lack of training in corresponding CPR management skills, while the awareness of CPR and first aid knowledge and skills in the trained students was significantly better than those who did not accept training (P<0.05). In addition, in the comparison of the awareness rate of first aid knowledge of emergency telephone, contusion and CPR, differences between males and females were statistically significant (P<0.05). More than 70% participants had a general knowledge of first aid, but the specific operation was lack of systematic understanding.

Conclusion: Middle school students were lack of first aid knowledge and skills, and they should be strengthened the popularization of CPR, first aid knowledge and skills training.

Keywords: Middle School Students; Cardiopulmonary Resuscitation; First Aid Skills

Background

In recent years, cardiopulmonary resuscitation (CPR) has been the most popular first aid skill among middle school students in urgent need of universal training. The start time of CPR is critical to the success of cardiac arrest, and effective CPR with in 4 minutes of cardiac arrest will improve patient survival1. But 88.7% of respiratory and cardiac arrest occurred outside of the hospital [1], and 2/3 of the patients died 25 minutes after the onset, because of the limitation of all kinds of objective conditions, it is difficult for emergency personnel to arrive at the accident site in the ideal time to take effective first aid measures, so the success rate of CPR must depend on the participation of the whole people. Middle school students, as a special group, have a wide contact, and are the most effective age to apply first aid skills [2]. CPR education and training for middle school students will achieve good social effects through their knowledge disseminate to people around them [2,3,4].

In China and many countries, most of the previous studies were focused on the first aid skills of medical students and college students, but there were few studies on the mastery of first aid skills among middle school students [5,6]. Therefore, this research is mainly to understand the knowledge of middle school students about CPR, as well as the mastery of processing of the first aid skills, arouse the learning awareness of first aid skills, and provide ideas for popularizing first aid knowledge and skills in middle school students in the later stage [7,8].

Methods

Materials:

The participants of this survey are male and female students of some junior middle schools and senior middle schools in Guiyang city, China.

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Sampling Method:

From March to May 2018, 2 middle schools (No. thirty-eight and No. twenty-five) were randomly selected in the city of Guiyang using a random cluster sampling method, from the selected schools randomly selected 3 classes (the class is: junior one 15 class, senior two 23 class, senior two 11 class□junior two 10 class, junior three 32 class, senior one 11 class), and the selected classes of all students (each school 300) as the subject of this survey.

Method of Investigation

Self-designed questionnaire was administered according to the 2010 AHA guidelines for cardiopulmonary resuscitation and cardiovascular first aid [9] combine with the 2015 guidelines updates [10]. The questionnaire included: general demographic characteristics of students, presence of medical staff at home, training in first aid, knowledge of CPR, handling of CPR and first aid skills, access to first aid knowledge channels, influencing factors and CPR training needs and other related information. The survey adopted the method of on-site questionnaire distribution, on-site filling and on-site recovery, which was completed by the participants who were selected and participated voluntarily. During the survey, the investigators didn't give any prompt except for the necessary explanation.

There were 25 questions in the questionnaire, among which 22 were single-choice questions and 3 were multiple-choice questions. Correct answers to each question were scored 4 points, wrong selection or missed selection of 0 points. A total score of 100 point out of 60 was considered as knowing.

Quality Control

Before the investigation, informed consent was obtained, and the research project was approved by the Ethics Committee of Zunyi Medical University (No.1-067, 2018). By the unified professional training of the investigators into the class survey, the questionnaire unified by the on-site investigators check after recycling collation, and then use the Epi Data 3.1 software to build a database, using double-track input to check the consistency of data [11].

Statistical Analysis:

SPSS25.0 software (version 25.0, IBM Corp., Armonk, NY, USA) was used for data logical cleaning and statistical analysis, the counting data was expressed in n (%), and statistical comparisons between groups were inferred using the Chi-square test, P <0.05 was considered statistically significant.

Results

600 questionnaires were distributed and 590 valid questionnaires were collected, the recovery rate was 98.33%. The questionnaire distribution of the respondents is shown in Table-1.

Table-1: Participants distribution of the survey.

Student classification	Number of student	Proportion(%)
Male student	300	50.85
Female student	290	49.15
Junior middle school student	299	50.68
Senior middle school student	291	49.32

Middle school students CPR operation:

The results showed that less than 20% were able to make a correct judgment of cardiac arrest, and more than 70% had no knowledge of the exact location, frequency and force of CPR. (Table 2).

Table-2: The cognition situation of CPR theoretical knowledge in middle school students [n (%)].

Subject	Junior middle school student(n1=299)	Senior middle school student(n2=291)	Total(590)
CPR prime time	45(15.05)	25 (8.59)	70(11.86)
Heart stop jump judgment	64(21.40)	52(17.87)	116(19.66)
Approach to airway opening	86(28.76)	66(22.68)	152(25.76)
Extrathoracic pressing site	41(13.71)	30(10.31)	71(12.03)
Frequency of chest compressions	29(9.70)	15(5.15)	44(7.46)
Extraspectoral compressions	31(10.37)	20(6.87)	51(8.64)
Artificial breathing method	66(22.07)	50(17.18)	116(19.66)
Effective indication for CPR	69(23.08)	55(18.90)	124(21.02)
Correct place the patient position	95(31.77)	77(26.46)	172(29.15)
Scope of CPR use	59(19.73)	39(13.40)	98(16.61)

Understanding of emergency knowledge about CPR among middle school students of different sexes:

There was a significant difference between males and females in the awareness rate of first aid telephone, contusion treatment and CPR (P<0.05). The awareness rate of female students was higher than that of male students. (Table 3).

Table-3: Knowledge of first aid knowledge related to CPR between genders[n(%)].

First aid knowledge	Male (n1=300)	Female (n2=290)	X^2	P
First aid telephone	142(47.33)	271(93.45)	149.33	< 0.001
Hemostatic method	88(29.33)	96(33.10)	0.977	0.323
Contusion treatment	43(14.33)	83(28.62)	17.922	< 0.001
CPR	26(8.67)	46(15.86)	7.126	0.008
Coma first aid	92(30.67)	108(37.24)	2.845	0.092
Carry	57(19.00)	52(17.93)	0.112	0.738

The needs of middle school students for CPR knowledge, the training methods and the willingness of rescue:

The returned questionnaires showed that more than 85% people had no training in first aid, such as CPR, and more than 95% of students want to receive professional training of CPR. Nearly 80% of all students said they were very willing to rescue after mastering CPR skills. (Table 4).

Whether CPR was trained on the impact of first aid knowledge:

Whether or not the students attended the training had a significant impact on their degree of first aid knowledge. The knowledge of CPR and first aid in traffic accidents among the students who attended the training were significantly better than those who didn't attend the training in 3 sides (P<0.05). (Table 5).

Discussion

The risk of respiratory and circulatory system diseases is high, and studies have shown that the best rescue time for heart and lung disease is only 4 minutes, with the extension of the onset

time, the survival rate of patients is greatly reduced, so mastering basic first aid skills can effectively improve the survival rate of patients [12], cultivating the ability of first aid skills in middle school students may be can improve the success rate of first aid in China.

Table-4: Impact factors of CPR knowledge acquisition and demand for CPR training willingness.

Influence factors	Number of student	Percentage (%)	Training needs and willingness	Number of student	Percentage (%)
No awareness of acquiring such knowledge	482	81.69	Professional CPR training	576	97.63
No publicity of relevant knowledge in community	426	72.2	Professionals explain and combine with the simulation operation	497	84.24
No publicity of relevant knowledge in school	295	50	Training courses are offered in the schools	368	62.37
The network media lacks relevant knowledge publicity	205	34.75	Network video teaching	198	33.56
The CPR must be made by the professional Personnel implementation CPR	199	33.73	Community propaganda	162	27.46
Lack of time	159	26.95	Willing to take the initiative to rescue	458	77.63
Lack of interest	135	22.88			

Table-5: Participated in the training and didn't attend the training of first aid knowledge [n(%)].

First aid knowledge	Have participated in training (n1=70)	Haven't participated in training(n2=520)	X^2	P
First aid telephone	55(78.57)	386(74.23)	0.62	0.433
Hemostatic method	36(51.43)	167(32.12)	10.2	0.001
Cardiopulmonary resuscitation method	19(27.14)	76(14.62)	7.17	0.007
Carry	29(41.43)	106(20.38)	15.48	< 0.001

These results of the study indicated that the middle school students' knowledge of first aid was deficient and they lacked real practical ability, and they desire for systematic knowledge learn through professional workers, it is consistent with previous studies in China other areas [13,14]. The results also showed that CPR knowledge was significantly influenced by training, which was consistent with previous studies on CPR and first aid skills among middle school students in other regions [15,16,17,18]. In addition, the results showed that some students had a rough understanding of CPR first aid knowledge, but lack of knowledge of its specific operation, this is basically the same as the previous analysis of the Mianyang city, in Sichuan province [13]. The results suggest that most middle school students lack of first aid knowledge, but there is a great need for learning, so it is urgent to popularize CPR knowledge and technology among middle school students, the result is similar to a previous survey in Iranian [15].

Middle school students are healthy, open-minded, good at learning, and have strong interest in learning CPR, which will provide us with more possibilities and higher success rate in the future. As a teaching institution, schools have very complete educational facilities and target students with higher learning and acceptance, so the conditions for training are ripe [18]. In the course of training, we should make full use of the educational resources of the schools and adjust the teaching methods according to the characteristics of the students [17]. In recent years, many scholars are also exploring new methods of CPR training to increase the interest, popularity and rationality of it, such as video-assisted training, participatory teaching and video feedback [19]. CPR training methods' optimization will greatly accelerate it in the non-medical population and dissemination. It may also be possible to learn from the current hot media industry, such as make micro-videos, animations and so on to expand the scope of CPR knowledge. At the same time, the training of first aid knowledge can be combined with community hospitals, nursing homes and various kinds of public media to make the training process be a reasonable, safe and effective system.

We can draw on the experience of developed countries, formulate relevant laws and regulations, and strengthen the training of first-aid teachers also vigorously strengthen the promoting of relevant provisions on first-aid knowledge in middle schools. At the same time let CPR training in the compulsory education. The first-aid knowledge and practical ability of middle school students should be included in the school curriculum assessment, so that students can deeply understand and master the first-aid knowledge and practical skills. This may be able to compete time for the patients who will occur heart and lung diseases, but also to enable students to establish a sense of active learning and achieve the initial goal of cultivating students' knowledge of safe first-aid [18]. Due to the general shortage of emergency teaching equipments in middle schools, the routine practice of CPR may face the difficulty of insufficient resources. However, most hospitals have mature equipments and specialized medical staff, at this stage, it is necessary to strengthen the joint teaching of CPR skills in schools and hospitals. The Red Cross, medical schools and hospitals are encouraged to cooperate with middle schools in order to increase the prevalence of CPR among middle students [16].

The sampling method of this study is random cluster sampling, there are some sampling errors, and only 2 middle schools may be slightly under-represented. Secondly, the questionnaire isn't a one-for-one interview survey, there may be situations in which individual students interact with each other in completing the questionnaire.

To sum up, the popularization of CPR and first-aid-knowledge for middle school students is extraordinarily urgent. The ministry of education and relevant departments can take measures to enhance the media publicity to enhance the learning awareness of middle school students. Meanwhile encourage interactive teaching and training between schools and medical institutions to promote the dissemination of professional knowledge and skills.

References:

1. Min Zhong, Dongsheng Chen, Peng Huang, et al. Application of PDCA cycle theory in teaching of cardiopulmonary resuscitation skills for medical students PDCA [J]. China Medical Education Technology, 2017, 31(06):703-705.
2. Jingjing Chen, Xiaojun He. Analysis on the training effect of knowledge and skill of cardiopulmonary resuscitation in middle school students [J]. Chinese Journal of Social Medicine, 2018, 35(02):210-213.
3. Aloush Sami. Effectiveness of basic life support training for middle school students [J]. The Journal of School Nursing: The Official Publication of the National Association of School Nurses, 2019, 35(04):262-267.

4. Wenke Liao. Thoughts on strengthening campus first aid education and construction of first aid system in China [J]. Chinese Journal of School Health,2017, 38(08):1121-1123+1126.
5. Di Huang, Yanru Chen, Zhixia Jiang, et al. Effects of CPR educational games on CPR knowledge acquisition and retention in nursing undergraduate students [J]. Journal of Nursing Science,2021, 36(16):59-62.
6. Fubin Tian, Qingmei Li, Dandan Tan. Effect analysis of first-year medical students' training in cardiopulmonary resuscitation [J]. Continuing Medical Education,2021,35(02):26-27.
7. Bennur Koca, Başak Bayram, Ahu Pakdemirli, et al. Psychological effects of CPR training methods on high school students: a randomized trial [J].Current Psychology,2020,17, (03):202-209.
8. Chamdawala Haamid, Meltzer James A, Shankar Viswanathan, et al. Cardiopulmonary resuscitation skill training and retention in teens (CPR START): a randomized control trial in high school students [J]. Resuscitation Plus, 2021,12(05):79-86.
9. Field JM, Hazin ski MF, Michael R, et al. Executive summary:2010 American heart association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care [J].Circulation, 2010, 122 (183):640-656.
10. Jia Li, Ying Wu, Peng Yue, et al. Revision and reliability-validity analysis of public cardiopulmonary resuscitation training effect evaluation tool [J]. Chinese Journal of Modern Nursing,2013, 19(07):750-752.
11. Xiansong He, Yuming Tang. Efficient design method for multitopic input with Epi Data [J]. Modern Preventive Medicine, 2016,43(24): 4523-4525.
12. Fangwen Zhao. Evaluation of pre-hospital first aid measures and effect for patients with traffic accident[J]. Electronic Journal of Clinical Medical Literature,2019, 6(78):7.
13. Shuang Zhao, Yang Peng. Current situation and analysis of knowledge and skills of safe first aid for middle school students [J]. Exam Weekly,2017,10(41):24.
14. Zhong Chen, Jinmei Zeng, Zhihui Ma, et al. Investigation on the latest knowledge of CPR first aid skills of students in newly-built “university town” and evaluation on the effect of popular science training activities [J]. Modern Medical Journal,2017, 45(10):1479-1482.
15. So KY, Ko HF, Tsui CSY, et al. Brief compression-only cardiopulmonary resuscitation and automated external defibrillator course for secondary school students: a multi school feasibility study [J]. BMJ Open, 2020,15(10):62-67.
16. Rujun Hu, Huiming Gao. Bibliometric analysis of published articles on CPR training of middle school students in China [J]. Medical Innovation of China,2019,16(16):165-168.
17. Tingting Zhao, Wenfang Zhao, Jinghong Xu, et al. Experience and significance of medical students in teaching medical science to middle school students: take CPR as an example [J]. Medical Education Research and Practice,2020,28(04):675-678.
18. Qinghua Qian, Zeng Huang. Study of the promotion and application of 2015 edition cardiopulmonary resuscitation among junior middle school students [J].China Modern Doctor,2020,58(27):144-147+151.
19. Zhendan Xu, Yan Xu, Rong Li. Effectiveness of the medical student's volunteer teaching in the training of the cardiopulmonary resuscitation among middle school students [J]. Chinese Journal of School Health,2019,40(10):1482-1484.

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