Knowledge and attitude on cardiopulmonary resuscitaton education of primary and secondary schoolteachers in China

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To the Editor: Early bystander cardiopulmonary resuscitation (CPR) is crucial for survival and long-term quality of life of patients with out-of-hospital cardiac arrest.[1] Training schoolchildren how to perform CPR is highly recommended by many countries and health organizations, including the World Health Organization.[2,3] Schoolteachers with previous training are highly suggested as CPR instructors to teach schoolchildren.[4,5] The CPR knowledge and previous training of the teachers are very important for their willingness to teach CPR and the quality of their teaching.[6,7] A 6-year longitudinal study confirmed that teachers who previously attended a 60-min theoretical and practical CPR course could provide adequate resuscitation training in schools.[8] In Belgium, some Flemish primary schoolteachers had a high interest in CPR training and were also willing to teach CPR.[7] In China, little is known about teachers' CPR knowledge and the attitude toward CPR education. The main goal of this study was to evaluate Chinese primary and secondary teachers' current CPR knowledge, previous training, and the attitude toward CPR education.

We conducted a prospective anonymous online survey. Our online questionnaire was designed using the Tencent questionnaire website (https://wj.qq.com/mine.html) and spread through WeChat, which is a widely used social media tool and also a convenient sampling method for administering questionnaires in China. The questionnaire was designed based on the European Resuscitation Council Guidelines for Resuscitation 2015 and previously documented scenario-based surveys.[7,9] The 24-item questionnaire comprised four distinct aspects: (1) demographic information, including age, sex, and educational cycle; (2) current awareness of CPR and previous CPR training; (3) willingness and attitude toward participating in CPR training and teaching; and (4) automated external defibrillator (AED)-related information and CPR knowledge, including recognition of cardiac arrest, hand placement for performing chest compressions, compression depth and rate, and compression–ventilation ratio.

The study participants included primary and secondary schoolteachers who were willing to complete the questionnaire by clicking on the online connection via WeChat. Questionnaires submitted between January 24 and February 8, 2018 were collected for analysis. The results of this online survey were exported from the Tencent questionnaire website. A total of 5556 questionnaires were collected, of which 5324 were valid.

Data analysis was performed using SPSS software (version 20.0 for Windows; SPSS, Inc., Chicago, IL, USA). Categorical variables were presented as percentages and analyzed using the χ^2 test. We considered the difference to be statistically significant when P value was less than 0.05.

Among the 5324 participants, 2329 were primary schoolteachers and 2995 were secondary schoolteachers. Of the participants, 96.8% had previously heard about CPR, with the highest proportion of participants learning about CPR from television (70.0%) and the lowest proportion from newspapers (39.1%). Previous CPR training experience was common (54.0%) [Table 1]. Furthermore, significant differences in previous CPR training were observed between schoolteachers of different ages, with the highest proportion of previous training in schoolteachers aged 30 to 39 years (60.7%) and the lowest proportion in teachers aged 50 years or older (36.6%). This result suggests that 30 to 39-year-old schoolteachers can be potential CPR teachers [Table 2].

Most schoolteachers knew how to assess consciousness (71.9%) and respiration (51.1%). The majority of the teachers knew correct hand placement (77.4%) and hand

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Table 1: Previous training status and the attitude toward CPR education of primary and secondary schoolteachers in China, *n* (%).

Characteristics	Overall schools (*N* = 5324)	Primary school (*n* = 2329)	Secondary school (*n* = 2995)	χ^2	*P*
Having heard about CPR	5153 (96.8)	2249 (96.6)	2904 (97.0)	0.663	0.416
If heard, how did you get information?*					
Television	3605 (70.0)	1599 (71.1)	2006 (69.1)	2.464	0.117
Newspaper or periodicals	2014 (39.1)	868 (38.6)	1146 (39.5)	0.401	0.527
Internet	2992 (58.1)	1329 (59.1)	1663 (57.3)	1.738	0.187
Training courses	3240 (62.9)	1396 (62.1)	1844 (63.5)	1.105	0.293
Previous CPR training	2876 (54.0)	1262 (54.2)	1614 (53.9)	0.046	0.829
Attitude on CPR education					
Willing to attend CPR training	5130 (96.4)	2229 (95.7)	2901 (96.9)	4.979	0.026
Developing a CPR course in school	4956 (93.1)	2177 (93.5)	2779 (92.8)	0.957	0.328
Willing to teach CPR	4886 (91.8)	2131 (91.5)	2755 (92.0)	0.414	0.520

* Overall, schoolteachers are 5153 according to the first line. CPR: Cardiopulmonary resuscitation.

Table 2: Training status and attitude toward training and teaching CPR to schoolteachers of different ages, *n* (%).

Characteristics	20–29 year (*n* = 1052)	30–39 year (*n* = 2136)	40–49 year (*n* = 1617)	>50 year (*n* = 519)	χ^2	*P*
Previous CPR training	552 (52.5)	1297 (60.7)	837 (51.8)	190 (36.6)	106.291	<0.001
Willing to attend CPR courses	1008 (95.8)	2067 (96.8)	1564 (96.7)	491 (94.6)	7.060	0.070
Developing a CPR course in school	976 (92.8)	2003 (93.8)	1498 (92.6)	479 (92.3)	1.591	0.435
Willingness to teach	961 (91.3)	1957 (91.6)	1495 (92.5)	473 (91.1)	2.732	0.661

CPR: Cardiopulmonary resuscitation.

Table 3: Current situation of CPR theoretical knowledge and AED information of schoolteachers, *n* (%).

Item	Overall (*N* = 5324)	Primary school (*n* = 2329)	Secondary school (*n* = 2995)	χ^2	*P*
Correct method to assess responsiveness	3827 (71.9)	1658 (71.2)	2169 (72.4)	0.983	0.321
Correct method to assess respiration	2723 (51.1)	1148 (49.3)	1575 (52.6)	5.697	0.017
Correct hand placement for chest compression	4120 (77.4)	1757 (75.4)	236 (78.9)	8.953	0.003
Correct hand posture for chest compression	4305 (80.9)	1897 (81.5)	240 (80.4)	0.934	0.334
Correct depth of chest compressions	960 (18.0)	347 (14.9)	613 (20.5)	27.485	<0.001
Correct frequency of chest compressions per minute	1549 (29.1)	593 (25.5)	956 (31.9)	26.489	<0.001
Correct ratio of chest compressions and artificial respiration	1513 (28.4)	598 (25.7)	915 (30.6)	15.304	<0.001
Knowing how to use an AED	863 (16.2)	386 (16.6)	477 (15.9)	0.404	0.525
Knowing placement of AEDs in the neighborhood	676 (12.7)	379 (16.3)	297 (9.9)	47.757	<0.001

AED: Automated external defibrillator; CPR: Cardiopulmonary resuscitation.

posture (80.9%) for correct chest compression. However, only 18.0% knew the depth of chest compression, 29.1% knew the frequency of chest compressions, and 28.4% could select the correct ratio of chest compressions and artificial respiration. Only a minority of teachers (16.2%) knew how to use AEDs and only 12.7% were aware of the placement of AEDs in the neighborhood. Therefore, we should strengthen further learning and systematic reviews of teachers' theoretical CPR knowledge [Table 3].

Importantly, in China, 96.4% of the participants responded that they would like to attend CPR training, 93.1% supported the development of a curriculum on CPR training in school, and 91.8% stated their willingness to teach CPR [Table 1]. In Barcelona, 83% of secondary schoolteachers identified the school as the best setting to perform a CPR training program and 69% of them were willing to teach CPR in classes.[10] Danish secondary schoolteachers were unwilling to perform CPR training unless they had acquired enough CPR skills through previous training.[11,12] Schoolteachers conducting CPR training in school are more likely to be realized in China if the relevant supporting policies, clear curriculum guidelines, and training-related equipment are available.

In summary, our findings revealed that Chinese primary and secondary schoolteachers have a preliminary understanding of CPR, but they lacked exact theoretical knowledge of CPR. More than half of them had experienced previous CPR training and had a high interest in participating in and conducting CPR training.

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Conflicts of interest

None.

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