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CPR knowledge and attitude to performing bystander CPR among secondary school students in Norway☆

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ABSTRACT

Background: Early bystander cardiopulmonary resuscitation (CPR) is essential for survival from out-of-hospital cardiac arrest (OHCA). Young people are potentially important bystander CPR providers, as basic life support (BLS) training can be distributed widely as part of the school curriculum.
Methods: Questionnaires were distributed to nine secondary schools in North Norway, and 376 respondents (age 16–19 years) were included. The completed questionnaires were statistically analysed to assess CPR knowledge and attitude to performing bystander CPR.
Results: Theoretical knowledge of handling an apparently unresponsive adult person was high, and 90% knew the national medical emergency telephone number (113). The majority (83%) was willing to perform bystander CPR in a given situation with cardiac arrest. However, when presented with realistic hypothetical cardiac arrest scenarios, the option to provide full BLS was less frequently chosen, to e.g. a family member (74%), a child (67%) or an intravenous drug user (18%). Students with BLS training in school and self-reported confidence in their own BLS skills reported stronger willingness to perform BLS. 8% had personally witnessed a cardiac arrest, and among these 16% had performed full BLS. Most students (86%) supported mandatory BLS training in school, and three out of four wanted to receive additional training.
Conclusion: Young Norwegians are motivated to perform bystander CPR, but barriers are still seen when more detailed cardiac arrest scenarios are presented. By providing students with good quality BLS training in school, the upcoming generation in Norway may strengthen the first part of the chain of survival in OHCA.

1. Introduction

Survival from out-of-hospital cardiac arrest (OHCA) depends on all the individual parts of the chain of survival,[1–3] and immediate bystander cardiopulmonary resuscitation (CPR) is a major contributor to survival from OHCA,[4–8] probably increasing survival fourfold.[9] However, bystander CPR rates vary between 15 and 50% in OHCA.[9–13] Layperson training and attitude to actually performing CPR in a given cardiac arrest situation, are both important factors in order to increase bystander contribution to OHCA survival.[11,14]

According to the literature, both basic life support (BLS) training,[10,15,16] and attitude to performing CPR,[17–19] varies between countries. Both factors also differ between different age groups. In recent studies, the willingness to perform CPR varies considerably among high school students in e.g. Japan[20] and New Zealand.[21]

To investigate knowledge of CPR and attitude to performing bystander CPR among young Norwegians, we questioned secondary school students about CPR training, self-reported experience with cardiac arrest situations, and how they think they would react in given cardiac arrest situations.

2. Materials and methods

800 questionnaires were distributed to second year students from the Specialization in General Studies Programme of nine sec-

Abbreviations: CPR, cardiopulmonary resuscitation; CC, chest compressions; BLS, basic life support; OHCA, out-of-hospital cardiac arrest; LOK, level of knowledge.

☆ A Spanish translated version of the abstract of this article appears as Appendix in the online version at doi:10.1016/j.resuscitation.2011.03.033.

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Table 1
Characteristics of the respondents, their level of knowledge and attitudes towards BLS training.

The respondents	All	Male	Female
Response to the questionnaire	376 (100%)	154 (41%)	222 (59%)
Age			
16	10 (2.5%)	3 (2%)	7 (3%)
17	239 (63.5%)	101 (65.5%)	138 (62%)
18	113 (30%)	47 (30.5%)	66 (30%)
19	14 (4%)	3 (2%)	11 (5%)
Level of knowledge			
Previous BLS training	335 (89%)	137 (89%)	198 (89%)
Where and how have the respondents got their BLS training?			
During school	272 (73%)	109 (71%)	163 (74%)
Elementary school	117 (31%)	41 (27%)	76 (34%)
Middle school	195 (52%)	89 (58%)*	106 (48%)
Secondary school	27 (7%)	10 (6%)	17 (8%)
Outside school (Red Cross, private organization, work, other)	234 (62%)	94 (61%)	140 (63%)
Confidence on having sufficient BLS knowledge in a situation with cardiac arrest	136 (37%)	67 (44%)*	69 (32%)
Knowledge about the exact correct emergency telephone number (113)	340 (90%)	131 (85%)	209 (94%)*
What is the survival rate in out-of-hospital cardiac arrest in Tromsø, Northern Norway?			
Approximately 35%	150 (40%)	58 (38%)	92 (41%)
Approximately 1%	16 (4%)	10 (6.5%)	6 (3%)
Approximately 10% (correct)	209 (56%)	85 (55.5%)	124 (56%)
What is the increment in chance of survival in out-of-hospital cardiac arrest, if the patient receives sufficient BLS before arrival of emergency personnel?			
It increases twofold (correct)	184 (49%)	68 (44.5%)	116 (52%)
BLS has little influence on survival if emergency personnel arrives early	16 (4%)	8 (5%)	8 (4%)
It increases fivefold	174 (47%)	77 (50.5%)	97 (44%)
You are alone and come across an apparently lifeless adult person. What do you do?			
Immediately start chest compressions	1 (0.25%)	1 (1%)	0 (0%)
Check for consciousness, secure airways and check if the patient is breathing (correct)	308 (84%)	122 (80%)	186 (87%)
Check for pulse	58 (15.75%)	29 (19%)	29 (13%)
It turns out the patient is breathing but shows no response to verbal stimuli. What do you do?			
Immediately start chest compressions	16 (4%)	7 (4.5%)	9 (4%)
Put the patient in recovery position and call for ambulance (correct)	342 (92%)	140 (91%)	202 (93%)
Check for pulse	14 (4%)	7 (4.5%)	7 (3%)
You decide to perform BLS. Which of the following combinations of chest compressions and mouth ventilation would you choose?			
30 chest compressions:2 rescue breathings (correct)	153 (41%)	60 (39%)	93 (42%)
30 chest compressions:5 rescue breathings	56 (15%)	26 (17%)	30 (13.5%)
2 rescue breathings:30 chest compressions	166 (44%)	67 (44%)	99 (44.5%)
Attitudes towards BLS training			
If you have had no BLS training outside school, what is the reason?			
Little interest	45 (32%)	25 (42%)*	20 (24%)
Little time	31 (22%)	16 (27%)	15 (18%)
Not sure where to attend course	61 (43%)	16 (27%)	45 (55%)*
Costs	5 (4%)	4 (7%)	1 (1%)
No answer	10 (7%)	3 (5%)	7 (9%)
Do you want more BLS training? Yes:	282 (75%)	94 (61%)	188 (85%)*
If you want more BLS training, what is the reason?			
Heart disease within family	20 (7%)	6 (6%)	14 (7%)
Wish of avoiding unnecessary death	228 (81%)	76 (81%)	152 (81%)
Other reason or no answer	34 (12%)	12 (13%)	22 (12%)
Do you think BLS training should be mandatory?			
Yes, in school	324 (86%)	127 (82%)	197 (89%)
Yes, to obtain driving license	194 (52%)	80 (52%)	114 (51%)
Yes, training should be included in all occupations	123 (33%)	51 (33%)	72 (32%)
No, BLS training should be optional	4 (1%)	2 (1%)	2 (1%)

BLS = basic life support. No other statistical significant difference between genders for any of these variables.
* $p < 0.05$, between genders.

ondary schools in the counties of Nordland and Troms (Norway). Approval was given by the Chief County Education Officers and the headmasters of the selected schools. Participation was voluntary and the form teachers were kindly asked to motivate the students to respond to the questionnaire. One reminder was given six weeks after the initial contact. Students outside the target group, age 16–19 years and the Specialization in General Studies Programme, were excluded.

The printed questionnaire (see supplementary material) consisted of three sections with 28 questions. Section 1 assessed the students' BLS training level, attitude to receiving further training, and personal experience with cardiac arrest. Section 2 tested the theoretical knowledge of BLS, and in Section 3, the students were asked to comment on six realistic hypothetical cardiac arrest scenarios in order to evaluate attitudes to performing BLS in given situations.

Recording of the anonymously completed questionnaires was approved by the University Hospital's Data Protection Officer. The completed questionnaires were transferred to a Microsoft Excel (2007 version, Microsoft Corporation, USA) spreadsheet for analysis. Non-continuous data were analysed with Chi-square tests. For E-values ≤ 5, Fisher exact tests were used with SPSS (16.0 version, SPSS Inc, Chicago, USA). Significant p-values were recorded as <0.05, <0.01 or <0.001.

3. Results

3.1. The respondents

A total of 404 completed questionnaires were returned, but 28 of these did not fulfil the inclusion criteria, leaving 376 participants. The main characteristics of the respondents are shown in Table 1.