



Simulation and education

Differential effects of ageing and BLS training experience on attitude towards basic life support[☆]Miki Enami^a, Yutaka Takei^a, Hideo Inaba^{a,*}, Takahiro Yachida^a, Keisuke Ohta^a, Testuo Maeda^b, Yoshikazu Goto^b^a Department of Emergency Medical Science, Kanazawa University Graduate School of Medicine, 13-1 Takaramachi, Kanazawa 920-8641, Japan^b Department of Emergency Medical Center, Kanazawa University Hospital, Kanazawa 920-8641, Japan

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ABSTRACT

Purpose of study: To determine the effects of ageing and training experience on attitude towards performing basic life support (BLS).**Methods:** We gave a questionnaire to attendants of the courses for BLS or safe driving in authorised driving schools. The questionnaire included questions about participants' backgrounds. The questionnaire explored the participant's willingness to perform BLS in four hypothetical scenarios related to early emergency call, cardiopulmonary resuscitation (CPR) under their own initiative, telephone-assisted compression-only CPR and use of an automated external defibrillator (AED), respectively.**Results:** There were significant differences in gender, occupation, residential area, experience of BLS training, and knowledge of AED use among the young (17–29 y, $N = 6122$), middle-aged (30–59 y, $N = 827$) and elderly (>59 y, $N = 15,743$) groups. In all four scenarios, the proportion of respondents willing to perform BLS was lowest in the elderly group. More respondents in the elderly group were willing to follow the telephone-assisted instruction rather than performing CPR under their own initiative. Multiple logistic regression analysis confirmed ageing as an independent factor related to negative attitude in all scenarios. Gender, occupation, resident area, experience with BLS training and knowledge about AED use were other independent factors. Prior BLS training did not increase willingness to make an emergency call.**Conclusion:** The aged population has a more negative attitude towards performing BLS. BLS training should be modified to help the elderly gain confidence with the essential elements of BLS, including making early emergency calls.

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1. Introduction

The chain of survival describes the actions linked with an increased likelihood of survival following out-of-hospital cardiac arrest (OHCA).¹ The first three of four links in the chain of survival are early recognition and call for help, early cardiopulmonary resuscitation (CPR) and early defibrillation, all of which have potential effects on survival.^{2–4} Bystanders should activate the emergency medical service system by making an emergency call (119 in Japan) immediately after finding the patient unresponsive⁵ or requiring basic life support (BLS).^{6,7} A delay in performing an emergency call has been shown to exert a negative impact on outcome following OHCA.^{2,8,9} If cardiopulmonary resuscitation (CPR) is started early by bystanders, the chance of survival is significantly improved.^{3,4} Telephone-assisted instruction of compression-only CPR, which is

currently performed by dispatch officers in our regional fire departments, has been recommended to increase the rates of bystander CPR and patient survival.^{10,11} Early defibrillation is becoming possible through the introduction of publicly accessible automated external defibrillators (AEDs).¹²

In addition to the attitude of citizens towards CPR and AED use, several reasons why bystanders may be reluctant to initiate CPR and use an AED have been reported.^{13–17} We recently reported that willingness to make an early emergency call, perform CPR under one's own initiative, telephone-assisted compression-only CPR and the use of an AED were influenced by the revision of BLS guidelines, previous CPR training, gender, residential area and occupation.¹⁸

In Japan, new driver's licence applicants are required to take a 3-h BLS training course at their driving school¹⁸ and compulsory BLS education is conducted in high schools.¹⁴ Small BLS training courses are frequently conducted by fire departments and the Japanese Red Cross association. Previous BLS training has been shown to increase willingness to perform CPR.^{13,14,18,19}

As in other industrialised nations, Japan has a rapidly ageing population,²⁰ which has led to an increase in the number of households with elderly residents.²¹ As the majority of OHCA's

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occur at the patient's home, elderly citizens may witness OHCA at home.^{8,19,22} Interest in participating in a BLS course has been reported to decrease with ageing.²³ However, the effects of ageing on citizens' attitudes towards performing BLS have not been reported.

In this large questionnaire survey, we examined whether ageing influences the attitudes of the population towards performing BLS and whether the beneficial effects of increased exposure to BLS courses may differ between elderly and non-elderly citizens. Finally, we identified the factors that influence attitudes towards performing BLS.

2. Methods

This study received ethical approval by a committee of Ishikawa Designated Driving School Association and an institutional review board (#844). The questionnaires were developed in accordance with the guidelines for the Law Concerning the Protection of Personal Information.

2.1. Respondents and setting

Respondents were new driving licence applicants who participated in BLS training courses and drivers who took part in training courses for safe driving at 17 authorised driving schools in the Ishikawa prefecture, Japan. The Ishikawa prefecture has a population of 1.17 million and covers an area of 4185 km². The prefecture was divided into central (urban or suburban) and three other rural or semi-rural regions. All of the fire departments in the Ishikawa prefecture have a dispatch system that provides telephone-assisted instruction of compression-only CPR. The instruction is initiated when the victims are unresponsive and when their breathing is presumed to be agonal. In the study period of this questionnaire survey, the instruction was performed in 60% of OHCA's witnessed or recognized by citizens and was accepted by 68% of the citizens.

2.2. Questionnaires

We gave questionnaires to 25,922 participants at the beginning of BLS courses and to those attending safe driving training courses (also mostly at the beginning). The questionnaires included the respondent's age group, gender, residential area, occupation, previous BLS training and the time from the most recent BLS training course. We asked questions regarding willingness to perform BLS in four hypothetical emergency scenarios¹⁸ related to the initial three links in the chain of survival. Respondents were instructed to select the option that they would choose if they would have been faced with the situation presented. The multiple choices included both positive and negative actions. When they selected negative actions, they were instructed to select the reason from the multiple choices presented or to write free comments. The time given for filling in the questionnaire was 10 min (Table 1).

2.3. Study period and grouping

The study period was from May 2007 to May 2009. The survey of BLS course participants was interrupted between October 2007 and April 2008 for another questionnaire survey. The respondents were divided into young (17–29 y), middle-aged (29–59 y) and elderly groups (>59 y).

2.4. Statistical analysis

We analysed the data using JMP ver.7 (for Windows; SAS Institute). The *chi-square* test was applied for monivariate analyses.

We used multiple regression analysis to confirm the effects of ageing and to elucidate the factors related to negative attitude. In all analyses, $P < 0.05$ was taken to indicate statistical significance.

3. Results

3.1. Number of respondents

We collected all the questionnaires given to 25,922 participants without regard of blank response to some of the questions. Indeed, not all respondents answered all questions. In data analysis, we first excluded 3230 respondents who did not supply the required information about their backgrounds. When we analysed the relationship between backgrounds and willingness to perform each scenario, we further excluded the respondents who did not provide an answer for each scenario (Fig. 1).

3.2. Comparison of backgrounds and characteristics of respondents among age groups

There were significant differences in backgrounds and characteristics among the age groups. The proportions of male respondents and those who lived in urban areas were highest in the young group and lowest in the elderly group. The proportion of respondents who had had previous BLS training and knowledge about how to use an AED was highest in the young group and lowest in the elderly group. The greatest proportion of respondents who had attended a BLS course less than 3 years ago was in the young group. The majority of respondents in the young group were students and employed persons in the middle-aged group. Most of the respondents in the elderly group had no steady job (Table 2).

3.3. Comparison of willingness to perform BLS among groups

Monivariate analysis revealed significant differences among the three groups in the proportion of respondents willing to perform BLS. In all four scenarios, the proportion of respondents with a positive attitude towards performing BLS was lowest in the elderly group and highest in the young group. More respondents in the elderly group were willing to follow telephone-assisted instruction of compression-only CPR rather than performing CPR under their own initiative. Of the respondents who were willing to perform CPR under their own initiative, 31.3% (2559/8186) in the elderly group, 21.9% (129/589) in the middle-aged group and 20.1% (965/4810) in young group selected compression-only CPR. Only 21.4% of respondents in the elderly group were willing to use an AED. Approximately 20% of respondents in the elderly group and 10% of respondents in the young and middle-aged groups were unwilling to make an early emergency call. The major action that these negative respondents chose to take was calling their neighbours, friends or home doctor (78.8%, 56.9% and 89.3% in the young, middle-aged and elderly groups, respectively) (Table 3).

3.4. Estimation of acceptance rate of telephone-assisted CPR instruction

We analysed the subgroup of respondents who were unwilling to perform CPR under their own initiative. Of these respondents, 71.1% (5451/7674) answered that they would follow telephone-assisted instruction of compression-only CPR. This acceptance rate decreased with age; 89.6% (1151/1284) in the young group, 86.9% (200/230) in the middle-aged group and 66.6% (4100/6160) in the elderly group.

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