Is the public equipped to act in out of hospital cardiac emergencies?

K L Smith, P A Cameron, A D McR Meyer, J J McNeil

Study objective: This study aimed to determine whether the people in Australia are informed about and prepared to intervene in a cardiac emergency.

Methods: A cross sectional telephone survey, which contained sections regarding participant demographics, cardiopulmonary resuscitation (CPR) training, knowledge of CPR, and the emergency contact number and potential barriers to performing chest compressions and mouth to mouth.

Results: A total of 1489 people completed the questionnaire. Only 11% of the population had recently (<12 months) trained in CPR. When presented with a cardiac arrest scenario most participants stated that they would telephone 000. Significantly more respondents believed that they would give mouth to mouth to a family member compared with a stranger. A bleeding victim and fear of not having the skills were the most common barriers that reduced the participants perceived willingness to perform chest compressions and mouth to mouth.

Conclusion: This study suggests that a low percentage of the public is currently trained in CPR and also that they are unprepared to act in a cardiac emergency.

METHODS

Study design
Ethical approval was obtained from the Alfred Hospital Ethics Committee. The study was a cross sectional survey of Melbourne (population about 3.5 million) and the rest of state Victoria, who are informed about and prepared to intervene in a cardiac emergency.

Survey instrument
The questionnaire contained sections regarding participant demographics, CPR training, knowledge of CPR, and the emergency contact number and potential barriers to performing chest compressions and mouth to mouth. A split sample technique was used for one question on the survey, which involved a scenario where a person collapses and participants were asked unprompted to describe step by step what they think they would do. In half of the questionnaires administered, the person described in the scenario was a stranger in the street and in the other half a family member. The survey instrument has not been validated, however the general content was similar to a survey used to investigate public knowledge in Canada.

Data analysis
The sampling frame was designed so that the final sample would consist of 750 participants from within metropolitan Melbourne and 750 from other areas of Victoria. A total sample of 1500 people allowed for a sampling error of +/-2.6% in 95 of 100 samples.

Survey responses were weighted to adjust for the specific sampling design. All data were analysed using the statistical package STATA. Categorical data were expressed as percentages and odds ratios with 95% confidence intervals. Statistical significance was analysed by a design based χ² statistic. Continuous data were described as a mean and 95% confidence intervals and analysed by an unpaired two tailed Student t test. Because multiple comparisons were made from a single dataset the level for statistical significance was set at <0.01.

RESULTS
A total of 2889 households were contacted between September 2000 and August 2001. Participants were excluded if the phone number was invalid (n=590), there was no answer after six telephone calls (n=174), or the participants had insufficient English or competency to participate (n=254). Of the 1871 households with eligible respondents at home at the time of telephone contact, the questionnaire was completed in full by 1489 (79%) of respondents. This did not change the power of the study as originally calculated.

When asked if they knew the emergency number 98% of participants correctly responded “000”. The majority (86%) of people stated that they knew what CPR involved. When asked to then describe CPR most (65%) respondents correctly described it as “pushing down on the chest and breathing into the mouth”.

Abbreviations: CPR, cardiopulmonary resuscitation; EMS, emergency medical services
Table 1: Responses to the cardiac arrest scenario

<table>
<thead>
<tr>
<th>Option</th>
<th>Total %</th>
<th>Scenario: Family member collapses at home (%)(n=736)</th>
<th>Scenario: Stranger collapses in street (%)(n=753)</th>
<th>Adjusted OR (95% CI)*</th>
<th>Female (%)</th>
<th>Male (%)</th>
<th>Adjusted OR (95% CI)*</th>
<th>Previous CPR training (%)</th>
<th>No previous CPR training (%)</th>
<th>Adjusted OR (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call 000</td>
<td>68.7</td>
<td>67.6</td>
<td>60.2</td>
<td>2.3 (1.8 to 3.0)</td>
<td>69.7</td>
<td>67.7</td>
<td>1.1 (0.8 to 1.4)</td>
<td>66.4</td>
<td>71.2</td>
<td>0.7 (0.5 to 1.0)</td>
</tr>
<tr>
<td>Give mouth to mouth</td>
<td>60.3</td>
<td>65.3</td>
<td>55.9</td>
<td>1.5 (1.2 to 2.0)</td>
<td>57.6</td>
<td>63.4</td>
<td>0.8 (0.6 to 1.0)</td>
<td>78.5</td>
<td>410</td>
<td>4.7 (3.5 to 6.2)</td>
</tr>
<tr>
<td>Give chest compressions</td>
<td>50.5</td>
<td>54.0</td>
<td>47.1</td>
<td>1.4 (1.0 to 1.8)</td>
<td>46.2</td>
<td>54.8</td>
<td>0.7 (0.5 to 0.9)</td>
<td>71.7</td>
<td>27.4</td>
<td>5.9 (4.4 to 7.8)</td>
</tr>
<tr>
<td>Get help/look for help/call for help</td>
<td>28.2</td>
<td>9.4</td>
<td>46.1</td>
<td>0.1 (0.1 to 0.2)</td>
<td>29.8</td>
<td>26.5</td>
<td>1.1 (0.8 to 1.5)</td>
<td>30.1</td>
<td>26.1</td>
<td>1.3 (1.0 to 1.9)</td>
</tr>
<tr>
<td>Clear air passage</td>
<td>22.7</td>
<td>24.3</td>
<td>21.2</td>
<td>1.2 (0.9 to 1.6)</td>
<td>24.0</td>
<td>21.3</td>
<td>1.2 (0.9 to 1.6)</td>
<td>26.5</td>
<td>18.6</td>
<td>1.4 (1.0 to 1.9)</td>
</tr>
<tr>
<td>DIABETES</td>
<td>17.3</td>
<td>16.9</td>
<td>17.4</td>
<td>0.9 (0.6 to 1.3)</td>
<td>13.8</td>
<td>20.8</td>
<td>0.5 (0.3 to 0.7)</td>
<td>28.9</td>
<td>47</td>
<td>6.1 (2.0 to 4.9)</td>
</tr>
<tr>
<td>Roll onto side</td>
<td>11.4</td>
<td>10.9</td>
<td>11.9</td>
<td>0.9 (0.6 to 1.3)</td>
<td>13.4</td>
<td>9.4</td>
<td>1.5 (1.0 to 2.4)</td>
<td>21.1</td>
<td>11.7</td>
<td>1.3 (1.0 to 1.6)</td>
</tr>
<tr>
<td>Cover/make comfortable</td>
<td>5.7</td>
<td>5.3</td>
<td>6.1</td>
<td>0.8 (0.6 to 1.3)</td>
<td>6.8</td>
<td>4.6</td>
<td>1.5 (1.0 to 2.4)</td>
<td>3.4</td>
<td>8.2</td>
<td>0.4 (0.3 to 0.6)</td>
</tr>
</tbody>
</table>

*Odds ratio calculated by multiple logistic regression adjusting for variables in table plus place of residence, previous health training, education and age. Percentages and odds ratios are weighted for over sampling of non-metropolitan Melbourne participants and by the Victorian population (age and gender). Bold type indicates a p value of <0.01.

DISCUSSION

Only 52% of the study sample were trained in CPR and only 20% of adults were trained within the past 12 months. Of those trained, 5% were significantly more likely to have received training if they were younger than 56 years of age (OR 3.3, 95% CI 2.6 to 4.3, p<0.001) compared with high school only. Respondents who took a training programme were significantly more likely to have received CPR training at home or in the street. Most participants stated that they would give mouth to mouth, check for dangers, and call for help (table 1). A bleeding victim and fear of having the skills were the most common barriers that reduced the participants perceived willingness to perform chest compressions and mouth to mouth (table 2).

The large numbers of those who would not give mouth to mouth is not surprising given the common barriers that reduced the participants perceived willingness to perform chest compressions and mouth to mouth (table 2). It may be that these barriers are also a result of insufficient CPR training delivered in the home or in the street. The fear of incorrectly performing CPR and fear of getting a disease are significant barriers to performing CPR.

Respondents who took a training programme were significantly more likely to be current CPR trained at home or in the street. Most participants stated that they would give mouth to mouth, check for dangers, and call for help (table 1). A bleeding victim and fear of having the skills were the most common barriers that reduced the participants perceived willingness to perform chest compressions and mouth to mouth (table 2).
components of the full CPR training courses such as, recognising an arrest, dialling 000, and providing chest compressions alone.

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**Contributors**

Karen Smith initiated and coordinated the formulation of the research idea, sought project funding and ethical approval, participated in the initial design of the questionnaire, piloted and refined the questionnaire, discussed core ideas, designed the study database, coordinated data collection, performed the statistical analysis and participated in the writing of the paper. Peter Cameron initiated and coordinated the formulation of the research idea, participated in the initial design of the questionnaire, discussed core ideas, designed the study database, coordinated data collection, performed the statistical analysis and participated in the writing of the paper. Alastair Meyer participated in the formulation of the research idea and in the initial design of the questionnaire and contributed to an initial grant application. John McNeil initiated and coordinated the formulation of the questionnaire and contributed to an initial grant application. Karen Smith is funded by a National Health and Medical Research Council Public Health Fellowship. The Alfred Hospital Research Foundation funded this project. The authors acknowledge Associate Professor Andrew Forbes for statistical advice.

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