

Simulation and education

# Barriers and facilitators to CPR training and performing CPR in an older population most likely to witness cardiac arrest: A national survey<sup>☆</sup>



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## ABSTRACT

**Background:** Bystander CPR rates are lowest at home, where 85% of out-of-hospital cardiac arrests occur. We sought to identify barriers and facilitators to CPR training and performing CPR among older individuals most likely to witness cardiac arrest.

**Methods:** We selected independent-living Canadians aged  $\geq 55$  using random-digit-dial telephone calls. Respondents were randomly assigned to answer 1 of 2 surveys eliciting barriers and facilitators potentially influencing either CPR training or performance. We developed survey instruments using the Theory of Planned Behavior, measuring salient attitudes, social influences, and control beliefs.

**Results:** Demographics for the 412 respondents (76.4% national response rate): Mean age 66, 58.7% female, 54.9% married, 58.0% CPR trained (half >10 years ago). Mean intentions to take CPR training in the next 6 months or to perform CPR on a victim were relatively high (3.6 and 4.1 out of 5). Attitudinal beliefs were most predictive of respondents' intentions to receive training or perform CPR (Adjusted OR; 95%CI were 1.81; 1.41–2.32 and 1.63; 1.26–2.04 respectively). Respondents who believed CPR could save a life, were employed, and had seen CPR advertised had the highest intention to receive CPR training. Those who believed CPR should be initiated before EMS arrival, were proactive in a group, and felt confident in their CPR skills had the highest intention to perform CPR.

**Interpretation:** Attitudinal beliefs were most predictive of respondents' intention to complete CPR training or perform CPR on a real victim. Behavioral change techniques targeting these specific beliefs are most likely to make an impact.

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## 1. Introduction

Out-of-hospital cardiac arrest (OOHCA) is responsible for more than 20,000 deaths annually in Canada.<sup>1</sup> It is uniformly fatal if not treated within minutes, and the overall survival rate for OOHCA rarely exceeds 8%.<sup>1,2</sup> A victim is three times more likely to survive when receiving bystander cardiopulmonary resuscitation (CPR) before emergency medical services (EMS) arrival.<sup>3</sup> Unfortunately, bystander CPR rates have remained low in Canada over the past

decade, not exceeding 25% in most regions.<sup>1,2</sup> Various attempts have been made to improve bystander CPR rates. These include the organization of mass CPR training events,<sup>4</sup> CPR training of family members of patients suffering from heart disease,<sup>5</sup> promotional CPR videos,<sup>6</sup> and CPR training of high school students.<sup>7</sup> None of these initiatives have succeeded in improving bystander CPR or survival rates for cardiac arrest thus far. This, in part because they target the wrong population.<sup>8</sup> Most cardiac arrest victims are in their late sixties, 85% collapse at home, and half are witnessed by a family member or friend who usually is over the age of 55.<sup>1</sup> In addition, social scientists have long believed that the determinants of CPR skill acquisition are different from those predicting helping behavior in an emergency situation.<sup>9–14</sup> We need to better understand how to motivate an older population to complete CPR training, and how to convince them to use their skills on a real cardiac arrest victim.

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The Theory of Planned Behavior (TPB) proposes that the strength of an individual's intention to engage in a behavior (in this case – “seeking CPR training” and “performing CPR on a cardiac arrest victim”), and the degree of control they feel they have over that behavior are the proximal determinants of engaging in that behavior.<sup>15–17</sup> Intention is influenced by three predictive variables: attitudes/behavioral beliefs (e.g. knowledge that CPR can save lives), subjective normative beliefs (e.g. having a spouse encouraging us to seek CPR training), and control beliefs (e.g. CPR classes being easy to find). Measuring an individual's intention to engage in a particular behavior has been shown to correlate well with actually performing the behavior.<sup>16</sup> Those theoretically derived determinants of behavior can later be mapped to specific behavior change techniques.<sup>18</sup> This approach has resulted in the development of successful interventions in the areas of smoking cessation,<sup>19</sup> colorectal cancer screening,<sup>20</sup> and physical fitness.<sup>21</sup> The purpose of this Canadian national study is to identify actionable determinants of behavior perceived to influence the intention of people over the age of 55, the population most at risk to witness a cardiac arrest, to seek CPR training or perform CPR on a real cardiac arrest victim.

## 2. Methods

### 2.1. Study design

We conducted two Canadian national telephone surveys. One evaluated barriers and facilitators to completing CPR training, the other evaluated barriers and facilitators to performing CPR on a real victim. Both surveys were based on the constructs of the Theory of Planned Behavior (Fig. 1).<sup>15–17,22</sup> We randomly assigned respondents to one survey or the other. We chose this design because both surveys measured very different behaviors – also because a combined telephone survey would have been time prohibitive for respondents and would have threatened response and completion rates.

### 2.2. Population

We recruited French and English speaking independent-living men and women aged 55 or older, the population most likely to witness a cardiac arrest.<sup>1</sup> This study was conducted after receiving research ethics approval from The Ottawa Hospital Research Ethics Board, Ottawa, Ontario (2007751-01H). All study participants provided informed verbal consent.

### 2.3. Sampling strategy

We sampled participants from an equal proportion of urban (>100,000 population), sub-urban (10,000 – 100,000 population) and rural (<10,000 population) locations based on 2001 Statistics Canada Census data. The number of participants from each Canadian province was proportional to the province's census, with the exception of maritime provinces (NFL, NB, NS, PEI) which we over-sampled due to their small population size.

### 2.4. Survey instrument

We created our survey instruments based on information from a systematic review of the literature on bystander CPR,<sup>8</sup> and themes emerging from semi-structured qualitative interviews (also based on the constructs of the TPB) with a purposive sample of 24 independent-living individuals aged 55 and older from urban and rural settings.<sup>23</sup>

Our survey instruments included a total of 49 (CPR training) and 48 (performing CPR) questions/statements in addition to a small number of demographic related questions. Questions were formulated into a statement format and quantified using a 5-point Likert scale ranging from “strongly agree” to “strongly disagree” with a “neither agree nor disagree” center option. Some questions were phrased negatively throughout both survey instruments (e.g. “CPR classes are difficult to get to”) in order to avoid yea-saying bias (answering the same for all questions).

Questions were designed to measure respondents' intention to engage in the proposed behavior (outcome variable) and the three TPB predictive constructs: attitude beliefs, normative beliefs, and control beliefs. First, respondents to the “performing CPR” and “CPR training” surveys were asked about their intention (outcome variable) to provide CPR to a cardiac arrest victim if one was to collapse in front of them, or to engage in a CPR training class in the next 6 months (time period selected to be realistic and committal). The impact of each TPB construct was then quantified using a combination of general and specific predictive questions.<sup>24</sup> General questions (e.g. “It is a good thing to have CPR training”) are meant to evaluate the “overall” predictive impact of the three TPB constructs (in this e.g., attitude belief). Specific questions are meant to evaluate the impact of “specific” actionable predictors of behavior within each TPB construct. For specific measures, a specific question/statement score is weighed (multiplied) by the score of a related measure of its impact, the product of which is considered to be predictive of the behavior or not (e.g. “CPR classes are diffi-

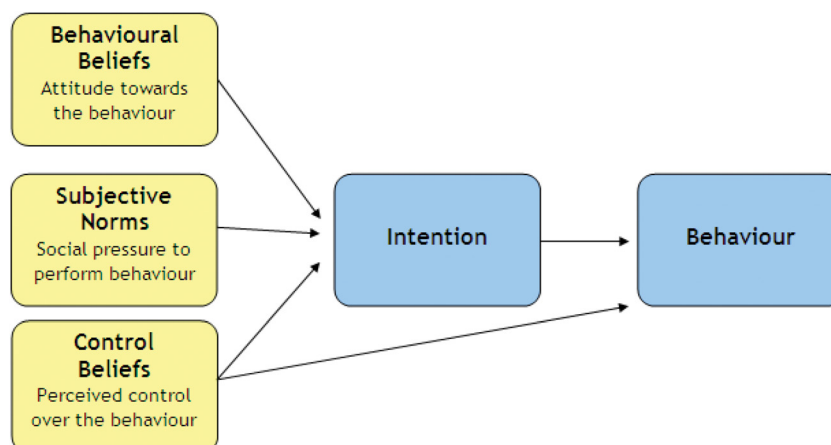


Fig. 1. The theory of planned behavior.

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