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# The influence of past experiences on future willingness to perform bystander cardiopulmonary resuscitation

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## Abstract

**Background:** The influence of past familial experiences of receiving cardiopulmonary resuscitation (CPR) and medical help in various cardiac arrest and nonfatal cardiac events toward willingness to “pay it forward” by helping the next cardiac arrest victim was explored.

**Methods:** Using a validated questionnaire, 6248 participants were asked to rate their willingness to perform bystander chest compression with mouth-to-mouth ventilation and chest compression-only CPR. Their past familial experiences of receiving cardiopulmonary resuscitation (CPR) and medical help in various cardiac arrest and nonfatal cardiac events were also recorded.

**Results:** Kruskal-Wallis test with post hoc Dunn’s pairwise comparisons showed that the following were significantly more willing to perform CPR with mouth-to-mouth ventilation: familial experience of “nonfatal cardiac events” (mean rank = 447) vs “out-of-hospital cardiac arrest with no CPR” (mean rank = 177),  $U = 35442.5$ ,  $z = -2.055$ ,  $p = 0.04$ ; “in-hospital cardiac arrest and successful CPR” (mean rank = 2955.79) vs “none of these experiences” (mean rank = 2468.38),  $U = 111903$ ,  $z = -2.60$ ,  $p = 0.01$ ; and “in-hospital cardiac arrest with successful CPR” (mean rank = 133.45) vs “out-of-hospital arrest with no CPR” (mean rank = 112.36),  $U = 4135.5$ ,  $z = -2.06$ ,  $p = 0.04$ . For compression-only CPR, Kruskal-Wallis test with multiple runs of Mann-Whitney U tests showed that “nonfatal cardiac events” group was statistically higher than the group with “none of these experiences” (mean rank = 3061.43 vs 2859.91),  $U = 1194658$ ,  $z = -2.588$ ,  $p = 0.01$ . The groups of “in-hospital cardiac arrest with successful CPR” and “in-hospital cardiac arrest with transient return of spontaneous circulation” were the most willing groups to perform compression-only CPR.

**Conclusion:** Prior familial experiences of receiving CPR and medical help, particularly among those with successful outcomes in a hospital setting, seem to increase the willingness to perform bystander CPR.

**Keywords:** Bystander cardiopulmonary resuscitation, Pay-it-forward, Cardiac arrest

## Introduction

As 80% of out-of-hospital cardiac arrest (OHCA) cases happened at home [1] as a result of cardiovascular diseases [2], it is imperative to educate the general public on the skills of bystander cardiopulmonary resuscitation (CPR) [3]. Studies have shown that bystander CPR improves the chance of survival of OHCA by up to two

to three times [4]. Despite that, the rate of bystander CPR has not been as encouraging as we would like it to be [5–7].

A number of studies had been conducted to identify factors influencing the willingness of bystanders to perform CPR [6–14]. These factors can generally be divided into two broad categories, i.e., (1) bystander factors and the (2) victim factors. Bystander factors that increase the willingness to perform bystander CPR include bystanders’ prior CPR training [6, 7, 10], bystander’s educational and income level [10–12], and the

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