

Review of: "The effect of video-instructed versus audio-instructed dispatcher-assisted cardiopulmonary resuscitation on patient outcomes following out of hospital cardiac arrest in Seoul"

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We found this article, which examined the association between dispatcher-assisted (DA) cardiopulmonary resuscitation (CPR) mode (audio-instructed DA-CPR vs. video-instructed DA-CPR) and resuscitation outcome among patients with out-of-hospital cardiac arrest (OHCA) in Seoul, Korea, interesting. It revealed that video-instructed DA-CPR was associated with favorable resuscitation outcomes [*i.e.*, Cerebral Performance Category (CPC) scores of 1 or 2, and survival to hospital discharge] among patients with OHCA.

However, there are several problems with the study. The biggest is that there was no information on the bystanders (*i.e.*, layperson rescuers) in the two CPR groups. The conditions for video-instructed DA-CPR were as follows: two or more bystanders were present at the time of patient collapse, and video call was available when CPR guidance was initiated. Compared with when there was one bystander, layperson rescuers were more likely to perform CPR in a less "upset" and more appropriate manner when there were two or more bystanders. In addition, the initiation of video-instructed DA-CPR requires adjusting the camera angle, changing the screen, and monitoring the patient's condition during the video call. In the pressing situation when someone collapses due to cardiac arrest, compared with elderly people, younger people will be able to handle the video much more easily. Concomitantly, the patients with OHCA in the audio-instructed DA-CPR group were older, and video-instructed DA-CPR was less frequent at home than that in public places (Table 1, Fig. 3), implying that video-instructed DA-CPR was less frequent in the case of old bystanders.

In video-instructed DA-CPR, one bystander communicates with a dispatcher through a smartphone, and another bystander performs chest compression. When it takes longer for emergency medical services (EMS) to arrive at the scene and the rescuer tires from performing CPR, another bystander can step in when there are multiple bystanders. Thus, compared with a single bystander, multiple bystanders can provide higher-quality, longer-lasting CPR. In summary, the criteria for DA-CPR mode might have induced selection bias among bystanders in the two groups, in attributes relevant to CPR. Compared with rescuers in the audio-instructed DA-CPR group, rescuers in the video-instructed DA-CPR group might have been younger, fitter, less upset, and thus may have had greater ability to perform accurate CPR. In the study,

the quality of the rescuers might have confounded the DA-CPR mode and resuscitation outcome. If the analysis had addressed the difference in the quality of rescues, the association between audio-instructed DA-CPR and long-term survival might have disappeared.

This can be explained as a problem related to consistency. Of the two conditions for video-instructed DA-CPR, one involved two or more bystanders. As noted above, there is a substantial difference between one and two or more bystanders with respect to attributes relevant to CPR. Specifically, “two or more” is vague and broad concept. The definition of exposure is contrary to the criterion of a “**sufficiently well-defined intervention**” [Hernán MA, Robins JM (2020). *Causal Inference: What If*. Boca Raton: Chapman & Hall/CRC]. This also poses a problem to the association between the video-assisted DA-CPR and favorable resuscitation outcome.

Finally, there were several minor problems. First, in the limitations section, the authors examined the association between DA-CPR mode and long-term survival in patients with OHCA stratified by the initial rhythm, and concluded that video-assisted DA-CPR was associated with favorable outcomes only in the VF/VT group. However, the results were not reported fully. Regarding Supplemental Table S1, we suspect that video-assisted DA-CPR was also associated with favorable outcomes in the asystole and pulseless electrical activity (PEA) group. Second, when seeking to explain the association between underlying disease (coronary artery disease) and favorable resuscitation outcome (Tables 2 and 3), the authors stated: “The family of patients with coronary artery disease may be more likely to have appropriate CPR knowledge or less fear of performing CPR than those without family members with coronary artery disease”. This seems to be the authors’ assumption only; literature supporting this view should be added, at least.