Availability and Quality of Internet-Based Cardiopulmonary Resuscitation Training Films Featuring Women Experiencing Cardiac Arrest

Despite efforts to reduce disparities in cardiopulmonary resuscitation (CPR) provision, men are more likely than women to receive bystander CPR worldwide.1,2 Women have worse outcomes following out-of-hospital cardiac arrest than men.1-3 In the Resuscitation Outcomes Consortium registry, men had a 29% increased probability of survival to discharge compared with women.1

Bystanders report common themes behind hesitation to perform CPR on women. Bystanders are less likely to remove clothing and place hands properly because of fears of personal violation, breasts interfering with CPR, and causing physical injury.4,5

Methods | The study was a cross-sectional analysis performed using the most common online search engine (Google) and the most common online video site (YouTube) to identify free, online instructional CPR films. Institutional review board approval and consent procedures were not required because this was not human subjects research. Each site was queried by searching for the phrase “how to do CPR.” The search was restricted to page 38 of the search results for Google (374 videos) and page 25 of the search results for YouTube (500 videos). Exclusion criteria included humor/parody or noninstructional content, pediatric CPR, CPR on animals, non-English language content, live videos, content from an in-hospital location, duplicate videos, CPR on a pregnant woman, or CPR on a man. The affected person’s sex was assessed visually by the authors. Although the face of Resusci-Anne, a CPR manikin, is modeled after a young woman, the torso lacks breasts and the manikin is considered unisex. Therefore, videos with no person in cardiac arrest other than this manikin were not considered to feature a woman experiencing cardiac arrest, particularly given that breasts are a common barrier to performing CPR on a woman.

Videos were scored (C.W.L.) and reviewed (L.E.B.T.) on 6 key aspects of CPR education: (1) assessing scene safety, (2) checking victim responsiveness, (3) activating emergency medical services, (4) properly positioning hands, (5) using an accurate rate of compression (100-120 per minute), and (6) using an appropriate depth (2-2.5 in [5-6 cm]).6 Those that demonstrated 5 or more criteria were considered high quality. Videos were also coded according to whether they taught current, hands-only CPR technique and specifically addressed barriers to performing CPR on women. Videos from the American Heart Association and American Red Cross were separately evaluated. Data collection occurred in April and May 2019. Data were analyzed with Excel version 16.16.22 (Microsoft).

Results | From 874 videos, 38 were excluded because of non-instructional or humorous content. Next, 184 were excluded for showing pediatric CPR or CPR on animals. Fourteen videos that were not in English, showed in-hospital locations, or were duplicates were also excluded. Of the remaining videos, 628 (98.4%) featured a man experiencing cardiac arrest or a unisex manikin without female anatomy. Some of these videos showed live action, and others featured animation. There were 10 unique videos (1.6%) featuring a woman experiencing cardiac arrest (8 actors, 1 manikin, and 1 animated character) (Figure 1).

From these 10 videos, only 4 were considered high quality (correctly addressing ≥5 key aspects of CPR training). Furthermore, 3 of the 4 high-quality instructional videos taught rescue breathing, which is no longer a recommended component of bystander CPR in the US. None of the films addressed barriers to performing CPR on a woman (Figure 2).

We separately evaluated online videos (available on YouTube) by the American Heart Association and American Red Cross, given their dominant role in CPR education in the US. Of the freely available online resources from these organizations (including clips from commercial products), 2 featured women experiencing cardiac arrest. One American Red Cross video was instructional for automated external defibrillator placement but not CPR, while the other was demonstration only and not educational. Neither addressed female-specific barriers to automated external defibrillator use or CPR.
Discussion | Online, easily accessible instructional videos are an important source of public CPR education. Of the 638 identified videos in this study, only 1.6% featured a woman experiencing cardiac arrest, with the remaining 98.4% featuring a man or a unisex, nonfemale manikin. Only 1 high-quality video was identified that taught modern, hands-only CPR on a woman. None of these videos specifically addressed barriers to performing CPR on a woman.

There was a striking scarcity of female-specific CPR instructional videos freely available online and a complete lack of videos specifically addressing barriers to performing CPR on a woman. Improved sex representation in CPR instructional videos is an important step to addressing sex disparities in bystander CPR. However, this is not enough. Female-specific CPR barriers (eg, navigation of breast anatomy) must be explicitly addressed in future CPR educational videos to begin addressing—and eventually reducing—sex disparities in CPR.

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COMMENT & RESPONSE

Should We Simplify Computed Tomography Angiography Reporting as Black or White vs Describing All Shades of Gray?

To the Editor We read with great interest the Prospective Multicenter Imaging Study for Evaluation of Chest Pain (PROMISE) trial substudy by Lowenstern et al,1 enlightening the age-related differences in the noninvasive evaluation for possible coronary artery disease (CAD). We congratulate the authors for this report; however, we would appreciate another presentation of the study results by factoring in the revascularization procedures that certainly modified patient’s risk for future cardiovascular death/myocardial infarction (MI) and by including more details of coronary computed tomography angiography (CTA) data rather than oversimplifying it to positive or negative findings.

The prognostic impact of CTA data is not solely based on whether the lesions are obstructive but also the plaque location and morphology. The fact that CTA data were not significantly associated with cardiovascular death and MI among those 65 years and older may be partly due to the limited aspects of CAD disease that were considered in the analysis. The integration of plaque extent, distribution (ie, anatomical location), and composition (noncalcified vs calcified vs mixed) may improve the association with outcomes and eventually alter the hazard ratio (HR). It would have been interesting to find out the HR with the use of comprehensive atherosclerotic risk scores, such as CTA-adapted Leaman score.2 In addition, the study found a positive anatomic test result was associated with cardiovascular death/MI among patients younger than 65 years, with an unadjusted HR of 3.48 (95% CI, 1.68-7.22). The HR may change when we incorporate more CTA details in the analysis. Taken all together, there may (or not) be an age dependency on these associations if the study data were explored using more aspects of CAD rather than just degree of stenosis.

Lastly, it should be acknowledged that some of the studied patients underwent revascularization procedures (ie, coronary