

Original Research Article

Gender inequality in hands-only cardiopulmonary resuscitation videos on YouTube

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ABSTRACT

Background: Bystander cardiopulmonary resuscitation (CPR) is performed at a significantly lower rate in women than in men. YouTube has a significant role in influencing the public's perceptions about CPR due to its popularity. The aim of the study was to compare the availability, quality, and scientific accuracy of YouTube videos demonstrating hands-only CPR performed on men and woman recipient.

Methods: Using three search terms similar to hands-only CPR, YouTube was searched for videos in English. This study included the first 60 videos for each search term. All the videos meeting the inclusion criteria were viewed and classified according to gender of recipient of CPR. Views per day were calculated. Videos were scored for quality and scientific accuracy, using Global Quality Scale (GQS) score and comprehensiveness analysis respectively. Mean, standard deviation was calculated for all the variables. Independent t-tests were done to compare the mean values. A p value < 0.05 was considered significant.

Results: Only 12 (1.7%) videos demonstrated hands-only CPR performed on women as compared to 43 videos (6%) demonstrated in men. There was a statistically significant difference in GQS score, whereas, there was no statistically significant difference in viewer rate and comprehensiveness analysis score based upon the gender of recipient of CPR.

Conclusions: The availability and quality of YouTube videos demonstrating hands-only CPR performed on men and women recipients differ significantly. There are limited numbers of videos available for demonstrations of CPR performed on women, and the majority of them are of poor quality and lack scientific accuracy.

Keywords: Gender, Hands-only CPR, Inequality, Women, YouTube

INTRODUCTION

Out-of-hospital cardiac arrest is a major public health concern with millions of people dying of sudden cardiac arrest every year, despite important advances in prevention.¹ Bystander cardiopulmonary resuscitation (CPR) improves the survival rate and neurological outcomes of patients who have experienced a sudden cardiac arrest.² However, despite the proven effectiveness of CPR by bystanders, the proportion of CPR by bystanders is still low in most areas around the world.³⁻⁵

Hands-only CPR was included in the 2010 American Heart Association (AHA) guidelines as an effective method for untrained bystanders to help simplify the steps of CPR. Hands-Only (compression-only) CPR is simpler for an untrained rescuer to perform and can be more easily guided over the phone by dispatchers. Furthermore, both Hands-Only CPR and CPR with both compressions and rescue breaths have comparable survival rates in cardiac arrests with cardiac aetiology.⁶ When a cardiac arrest occurs, the likelihood of CPR depends on the recognition of the event, the level of

training, and the willingness of a layperson responder to participate.^{7,8} Personal interactions, level of education, local cultures and norms, perceptions, concerns, and opinions about the dangers and benefits of performing CPR on a stranger all factor into “willingness” to perform CPR.⁹⁻¹¹

There is a gender gap in bystander CPR, according to studies, with women receiving bystander CPR at significantly lower rates than men.¹²⁻¹⁵ The AHA called for increased public awareness about cardiac arrest in women, to help address, gender related obstacles to improve bystander CPR rates for women. This includes women's representation in training materials and educational videos.¹⁶

The internet, especially platforms like YouTube (www.youtube.com), where visual content is plentiful, is now the most popular and frequently used source of information for people of all ages all over the world. Every month, over two billion logged-in users visit YouTube, and people watch over a billion hours of video and generate billions of views.¹⁷

Various studies have been conducted to evaluate the YouTube videos about CPR.¹⁸⁻²⁰ A recent study observed that there is a scarcity of female-specific CPR instructional videos available on the internet.²¹ To our knowledge, there has been no systematic analysis comparing videos about Hands-only CPR based on the gender of the recipient. Given the importance and misconceptions about it, this type of analysis would be a valuable next step in developing interventions.

The objective of the study was to compare the availability, quality, and scientific accuracy of YouTube videos demonstrating Hands-only CPR performed on men and woman recipient.

METHODS

This was an analytical cross-sectional study. The Google Trends website (https://trends.google.com) was used to find the most frequently used search term for ‘hands-only CPR.’ Google Trends measures search interest in topics by calculating the frequency of a search term which is entered in relation to the total search volume across various regions of the world. The search parameters were adjusted to ‘Worldwide’, ‘2008-present’ and ‘YouTube Search’. Comparative searches were conducted with defined key words that included ‘hands-only CPR’, ‘hands only CPR’, ‘hands-only cardiopulmonary resuscitation’, ‘hands only cardiopulmonary resuscitation’, ‘compression-only CPR’, ‘compression only CPR’, ‘compression-only cardiopulmonary resuscitation’, and ‘compression only cardiopulmonary resuscitation’. Based on comparative search results, it was determined that the most commonly used search terms were ‘hands-only CPR’, ‘hands only CPR’ and ‘compression only CPR’. Other search terms did not have enough data.

On 25 April 2021, YouTube (https://www.youtube.com) was queried by searching for the phrase ‘how to do hands-only CPR’, ‘how to do hands only CPR’ and ‘how to do compression only CPR’. Videos were searched after clearing of cache and using a new YouTube account to minimize results biased by cookies, personal settings, and browser history.

More than 90% of YouTube users clicked only the first three pages (i.e. 20 videos x three pages = 60 videos) of search results to receive the desired information.²² However, while YouTube no longer uses pages to display results, it used them in the form of a continuous list. Therefore, the first 60 videos for each search term were included in this study. There are four different methods of prioritizing searches on YouTube: by viewing count (preferentially selecting videos that are the most commonly viewed), by relevance (preferentially selecting videos that most exactly matches a search term), by upload date (preferable selecting the latest videos) and by rating (preferably selecting the higher rated videos). The three phrases were searched by each of these four prioritizing search methods. So the selection processes yielded a total of 720 videos.

To obtain the final sample, we eliminated duplicate videos, defined as those in which more than half of the content or footage was identical, which occurs, for example, when someone copies previously posted material and adds a negligible amount of new material; irrelevant videos, defined as those in which there was no audio or visual reference to demonstration of hands-only CPR; live videos; content from an in-hospital location; Pediatric CPR footage. Videos with CPR demonstration on unisex manikin were also eliminated. Although the face of Resus-Anne, a CPR manikin, is modelled after young women, the torso lacks breast and the manikin is considered unisex, particularly given that breast is a common barrier to perform CPR on a woman.

Uniform resource locators for all video samples included in the study have been saved for data archiving and future reference. Upload date and number of views were extracted from each video. Based on these data, viewing rate was calculated using the formula: number of views/ number of days since upload. The recipient's sex was assessed visually to determine whether a man or woman is experiencing cardiac arrest.

Included videos were evaluated for overall quality and scientific accuracy of information about hands-only CPR.

The quality of the videos was evaluated by Global Quality Scale (GQS). In the GQS scale developed by Bernard et al, the quality of the examined content is evaluated by a five-point system.²³ According to the GQS scale, information accessibility, quality, general flow, and how the evaluator thinks the content was useful to the viewer are evaluated (Table 1).

Table 1: Global quality scale (GQS).

Quality of videos	Score
Poor quality, poor flow, most information missing, not helpful for viewers	1
Generally poor, some information given but of limited use to viewers	2
Moderate quality, some important information is adequately discussed	3
Good quality, good flow, most relevant information is covered, useful for viewers	4
Excellent quality and excellent flow, very useful for viewers	5

The evaluation of the scientific accuracy was based on the amount of accurate scientific information using Comprehensiveness analysis containing six questions on key components of hands-only CPR education, with each question, the answer ‘no’ scored 0 point and the answer ‘yes’ scored 1 point. Total points for each video were counted. Those videos that demonstrated all six criteria were considered as excellent quality. The information available on the AHA website was considered as a gold standard (Table 2).²⁴

Table 2: Comprehensiveness analysis.

Key components of hand-only CPR	Score
Has it been mentioned about assessing scene safety before CPR?	1
Has it been mention about checking victim responsiveness?	1
Has it been mentioned about activating emergency medical services?	1
Has it been described properly positioning hands?	1
Has the optimal rate of compression (100-120 per minutes) been specified?	1
Has the optimal depth of compression (2-2.5 in (5-6 cm) been specified?	1
Total	6

All videos were reviewed and analysed by two independent researchers. Disagreements among the researchers regarding the scoring criteria of a particular video were resolved by discussing the issue until a consensus was reached.

Statistical analysis was performed using the IBM SPSS 20 statistical software (IBM, Armonk, NY, USA). Mean, standard deviation was calculated for all the variables. Independent t-tests were done to compare the mean values. A p value <0.05 was considered significant.

RESULTS

Out of 720 videos, 665 were excluded based on the exclusion criteria and 55 videos were selected for further

analysis. The number of excluded videos and the reasons for exclusion are shown in Table 3.

Table 3: Reasons of exclusion of the videos left out of the analysis.

Reasons	Total
Duplicate videos	434
Irrelevant videos	77
Live videos	4
In-hospital location	4
Demonstration on unisex manikin	123
Pediatric CPR footage	9
Language other than English	14

Out of 55, 43 videos demonstrated hands-only CPR performed on men, while 12 videos demonstrated in women. Analysis of videos with respect to a recipient of CPR is shown in Table 4. There was a statistically significant difference in GQS score, whereas, there was no statistically significant difference in viewer rate and Comprehensiveness analysis score based upon the recipient of CPR.

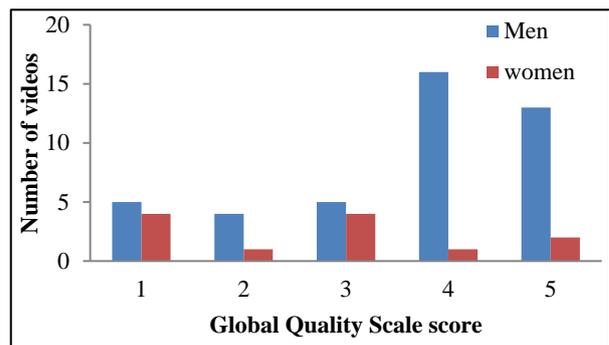


Figure 1: Number of videos according to GQS score.

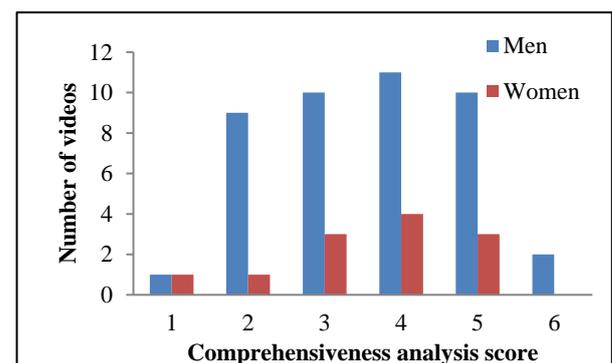


Figure 2: Number of videos according to comprehensiveness analysis score.

Figure 1 shows a comparison of number videos according to gender of recipient of CPR with regards to the GQS score. Two videos demonstrating hands-only CPR on women were of excellent quality as compared to 13 videos demonstrating CPR on men.

Table 4: Descriptive statistics of videos with respect to recipient of CPR.

Variable	CPR on men				CPR on women				P value
	Min	Max	Mean	SD	Min	Max	Mean	SD	
Viewers rate	0.03	1145.45	70.78	233.52	0.07	31.46	5.97	8.84	0.344
GQS	1	5	3.63	1.33	1	5	2.67	1.50	0.036*
Comprehensiveness analysis	1	6	3.60	1.26	1	5	3.58	1.24	0.96

* Significant p value: $p < 0.05$; SD: Standard Deviation.

Figure 2 shows a comparison of number videos according to gender of recipient of CPR with regards to the Comprehensiveness analysis score. None of the videos demonstrating hands-only CPR performed on women included all the key components. Two videos demonstrating hands-only CPR performed on men included all the six key components.

DISCUSSION

The availability and quality of YouTube videos demonstrating Hands-Only CPR performed on men and women recipients differ significantly. Only 12 (1.7%) videos demonstrated hands-only CPR performed on women as compared to 43 videos (6%) demonstrated in men.

The videos demonstrating CPR on women were of lower quality than the videos demonstrating CPR on men. It was concerning to find that none of the videos demonstrating hands-only CPR performed on women included all the key criteria of high quality CPR. Also, none of the video addressed the barrier to performing CPR on woman recipient. Each of the components of CPR is critical to provide high quality of CPR, with high quality CPR having a significantly higher association with survival compared to poor quality CPR.²⁵

In recent years, sex and gender based research has evolved at an unprecedented rate, revealing that the disease manifests itself in radically different ways in men and women. Researchers observed not only pathophysiology discrepancies between men and women, but also inequalities in health care delivery that have clinical implications in a wide range of diseases. Cardiovascular diseases are the first and well-studied of these.²⁶

Although the gender based disparities in cardiovascular disease has long been studied, gender based differences in out-of-hospital cardiac arrest have only recently gained attention.¹⁴ A study investigating public opinion shows why women who experience cardiac arrest in public places are less likely to receive bystander CPR than men. The study has found reasons such as potentially unwanted contact or exposure; fear of being charged with sexual assault; fear of causing physical harm; poor recognition of cardiac arrest in women, mainly the belief that women are unlikely to have heart issues or they are exaggerating

or "faking" an incident; or the assumption that breasts make CPR more difficult.²⁷ All of these major reasons can prevent women from receiving CPR or receiving CPR with significant delays.

Women may continue to receive less CPR from bystanders and have poorer outcomes from out-of-hospital cardiac arrest until policy and education address public concerns about the provision of CPR for women in cardiac arrest.

Since its inception in 2005, YouTube has opened videos to the public as a popular unregulated video sharing website that is free to the public. It has the potential to reach a large part of the public and disseminate information on a wide variety of topics.²⁸ With increasing popularity, the most famous YouTubers are now considered influencing factors.²⁹ Any YouTube enabled gadget, such as a smartphone or tablet, can be used to watch YouTube at any time. It's no wonder that health professionals and patients have turned to YouTube to get and disseminate medical information.

Given its popularity with Internet users and the fact that many people rely on it for information, why not use it to raise awareness about CPR for women in cardiac arrest among different population? To reduce sex disparities in CPR, female-specific CPR barriers must be explicitly addressed in CPR videos. In this context, it is an important message that all cardiac arrest victims should receive high quality CPR and that public awareness is critical to saving lives.

The responsibility for improving this situation should not fall on YouTube, which does not advertise itself as a provider of peer-reviewed health education, but rather on health professionals. Health professionals, who have the knowledge and skill, must take the task of creating high-quality videos to raise public awareness. It should be noted that some bystanders seeking CPR information may do so during an emergency, so providing clear information in a timely manner is critical.

Limitation

The limitation of the current study was that the search results are dynamic and will change when new videos are uploaded or old videos are removed. So, this cross-sectional study demonstrates the information on CPR at

that time. The use of a prolonged study period, however, can often generate an overwhelmingly large volume of social media data, which becomes unmanageable and difficult to analyse. This study only included videos in English.

Despite these limitations, we believe that important details and information can be obtained from this study for the accurate and complete delivery of medical content through online platforms.

CONCLUSION

The availability and quality of YouTube videos demonstrating Hands-Only CPR performed on men and women recipients differ significantly. There are limited numbers of videos available on YouTube demonstrating CPR performed on women, and the majority of them are of poor quality and lack scientific accuracy. To address female-specific barriers in the general population, health professionals, students, universities, health-related organizations, and other knowledge holders should be more involved in video production.

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