Commentary

Received: 2024/03/27  Revised: 2024/04/17  Accepted: 2024/04/25

DOI: https://doi.org/10.15441/ceem.24.223

Wikipedia as a highly accessed though imperfect source of knowledge on cardiopulmonary resuscitation

Running title: Wikipedia as a source of knowledge on CPR

Alexei A. Birkun, MD, DMedSc
Department of General Surgery, Anaesthesiology, Resuscitation and Emergency Medicine, Medical Institute named after S.I. Georgievsky of V.I. Vernadsky Crimean Federal University, Simferopol, Russian Federation
For correspondence. E-mail: birkunalexei@gmail.com
ORCID: 0000-0002-2789-9760
Dear Editor,

Nowadays, people are progressively seeking health-related information online. In particular, the lay public is searching the web to learn about cardiac arrest and cardiopulmonary resuscitation (CPR), and the search rates have been shown to occasionally rocket in response to media reports on cardiac arrest incidents in famous personalities [1]. It is quite reasonable to harness these public information-seeking efforts to massively enhance community awareness, knowledge, and attitudes towards bystander CPR which is fully recognised as a determinant of survival from cardiac arrest.

Wikipedia, an online, open-source encyclopaedia hosted by a nonprofit organisation Wikimedia Foundation (San Francisco, California, USA), is the sixth most visited website in the world [2]. Besides being the biggest and most-read reference work in history, Wikipedia is known as one of the most frequently accessed health information resources [3]. Although this encyclopedia includes a number of cardiac arrest- and resuscitation-related articles, the role of Wikipedia as an information resource on CPR has not yet been defined. This study was carried out to get an insight into the public use of Wikipedia for obtaining information on CPR, as well as to characterise Wikipedia’s content on CPR and determine its appropriateness for lay people.

In January 2024, a search engine results page analysis was conducted using Mangools suite (itrinity, s.r.o., Bratislava, Slovakia) to determine the ranking of Wikipedia’s article on CPR in web search results. The Mangools suite provides detailed insights into search engine results statistics for any search query, including an option to examine top-ranking pages for a given keyword. For the English-language search independent of the geography, the CPR article appeared in the fourth position in response to the “cardiopulmonary resuscitation” search query, and the eighth position in response to the “CPR” query. Considering that the first ten results on a search results page receive over 90% of all clicks for a search query [4], it is highly probable that many users select the Wikipedia’s article as the preferred source of information on CPR. This probability is further increased by the fact that search engines recognise CPR as a popular topic and give additional featured results on the top of the search results page that refer to the Wikipedia’s article on CPR. Based on the Mangools data, the number of the article visits per month for the “cardiopulmonary
resuscitation” and “CPR” search queries amounted to 29,540 and 6,440, respectively. Although the search engine results page analysis may not reflect the actual popularity of the web resource (in particular, the same people may access the website numerous times), the values above probably underestimate the actual readership of the article since many people are reaching it through other less popular search queries, or backlinks.

To determine the real numbers of views for the Wikipedia’s CPR article, Wikipedia Pageviews Analysis tool (pageviews.wmcloud.org) was utilised. This tool shows the number of times a particular Wikipedia article has been requested in a given time period. In the last five years (01.01.2019-31.12.2023), the CPR article received 2,590,694 views with a yearly, monthly, and daily average numbers of 518,139, 43,178, and 1,419, respectively.

The timeline graph revealed two outstanding spikes of monthly pageviews that happened in June 2021 and in January 2023 (+79% and +57% increment versus the five-year mean, respectively; Fig.1, panel A). Based on the temporal analysis using daily pageviews, Google Trends (Google LLC, Mountain View, California, USA), and a review of online news articles, the key triggering events that provoked these rises were identified as a cardiac arrest of the Danish footballer Christian Eriksen that happened on the 12th June 2021 during the Union of European Football Associations Euro 2020 match, and a cardiac arrest of the U.S. American football player Damar Hamlin that occurred on the 2nd January 2023 during the National Football League Monday Night Football game. Both athletes received immediate help on the field and were successfully resuscitated. As these matches were broadcast live on TV and watched by millions of people, the incidents acutely and greatly increased public demand for information on CPR. As is seen from the Google Trends data on search traffic (see Fig.1, panel B), people started to actively seek CPR online. And not least, the search led them to the Wikipedia’s CPR article. It is reasonable to assume that future incidents of cardiac arrest in famous people would induce new surges of interest in CPR and people would continue to massively access Wikipedia to satisfy their information demand. But what information does the Wikipedia’s article on CPR bring to a reader?
The CPR article is rated by Wikipedia as a B-class article (mostly complete and does not have major problems) and a high-importance medical article (less than 10% of medical articles achieve this rating). Excluding references, the article's volume is 6,712 words and 389 sentences. According to the Flesch Reading Ease Score (a well-established instrument that quantifies the readability level based on the number of words, syllables, and sentences in a given piece of text; the result is graded on a scale from 0 to 100, with lower scores indicating lower readability), the article has a readability of 45 points, meaning that more than 12 years of education are required to read and comprehend the material. The article contains an introduction and 15 sections, including Medical uses, Pathophysiology, Methods, Use of devices, Effectivity rate, Consequences, Prevalence, Society and culture, History, On animals, Research, See also, References, Further reading, and External links. Based on the XTools (a suite of statistics tools for Wikipedia) data, historically the article received a total of 3,030 edits from 1,398 editors, being first time edited over two decades ago, on 31 July 2002. The article’s average number of edits per month is 11.8, and the average time between edits is 2.6 days, suggesting its very dynamic nature. As of January 2024, the article was accompanied by 176 references, including 15 national and international guidelines and consensus documents. Though, 14 of these documents were published in 2015 or before, and nine of them were issued in 2010 or earlier. Assessment of the article for quality of content on lay-rescuer adult basic life support using the ERC Research NET checklist [5] showed that the article had incomplete coverage of the lifesaving procedure. Out of the 53 evaluated checklist criteria, only 19 (35.8%) were satisfied completely, 9 (17.0%) – were satisfied partially, and 25 (47.2%) – were not satisfied (Appendix). In particular, the article omitted important details on how to recognise cardiac arrest, how to perform chest compressions, and how to do rescue breathing.

In summary, considering Wikipedia’s popularity and its dominance in search engine results, this open encyclopaedia might play an important role in the broad dissemination of information on CPR, consequently influencing people’s attitudes about the bystander help and possibly their decisions regarding further resuscitation education. Annual readership of the English-language Wikipedia’s article on CPR exceeds half a million, and occasionally people are massively reaching its
content to learn about CPR. While acknowledging that the encyclopaedia aims to provide a comprehensive review of the topic, it cannot be denied that many and probably most people access the CPR article to get a brief and clear explanation of what CPR is and how to do it. However, the article in its current form is inappropriate for the latter purpose. Besides that the article is overwhelming in volume and its language is too sophisticated for people with lower literacy, the article’s content does not ensure full coverage of basic lifesaving interventions in cardiac arrest. It is important to adapt the article for the lay public to receive the maximum benefit from its extensive readership.

A reasonable way to satisfy the public information demand could be to start the article with an eye-catching featured section written in plain and accessible language, that should focus on the importance of bystander response in cardiac arrest, explain key evidence-based principles of lay-rescuer intervention, and address common barriers to bystander CPR. An addition of short self-explanatory videos and external resources for self-education would be useful. Since Wikipedia is a collaboratively edited encyclopedia that anyone with internet access can edit, the featured section should optimally be originally developed, periodically updated, and continuously supervised by experts familiar with the latest resuscitation guidelines. As Wikipedia contains over 60 articles on CPR in languages other than English, active participation of national resuscitation councils in the assessment and optimisation of the articles’ content is advisable.

Finally, it should be noted that considerably more research is needed to better understand public online information-seeking behaviour in relation to health emergencies and their management, and uncover the full potential of Wikipedia and other popular web resources as a means for massively enhancing public awareness, knowledge, and attitudes towards the bystander assistance in health crises.
Statements and Declarations

Conflict of interest statement. The author declares that he has no conflict of interest.

Funding. None.

Acknowledgements. None.

Keywords: Cardiac Arrest; Education; Information Science; Information Seeking Behavior; Internet; Resuscitation
References


**Figure legends**

**Fig. 1** Five-year trends of public access to Wikipedia’s CPR article, and public web search activity for CPR (01.01.2019-31.12.2023)

Notes. Panel A – daily and monthly views of Wikipedia’s CPR article (Wikipedia Pageviews Analysis data). Panel B – weekly relative search volumes for “cardiopulmonary resuscitation” search topic (Google Trends data). Relative search volume is calculated by dividing the number of searches for a specific search topic by the total number of Google searches performed in a particular geography and time range. A relative search volume of 100 is the peak search activity, whereas other values are normalised relative to the peak value.