

Review Article

Facebook as a Tool for Health Research: A Systematic Review

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Abstract: Background: A lot of researches have been conducted on public health; however few studies have used social media such as Facebook as data source. Objectives: To conduct a systematic review on the use of Facebook in public health research, define a terminology to describe Facebook use and classify the current state of Facebook in health research. Search Methods: Researchers performed a wide literature search in PubMed, Southern University Online Library, Google Scholar and SCOPUS through December 2019. Data Collection and Analysis: Four authors independently screened studies and extracted data related to analysis of Facebook, methodology used to study Facebook and current state of Facebook Research. Main Results: Of the 2506 articles identified in the interim database search, researchers found 727 unique articles. Of these, 103 of these articles met the eligibility criteria (see appendix). Researchers identified ways in which Facebook data were used by other researchers: Network Analysis of Facebook post (16.5%; n=17), Intervention based post (12.6%; n=13), Advertisement (6.8%; n=7), Survey (3%; n=3), Content Analysis (15.5%, n=16), Engagement (7.8%; n=8), Recruitment (29%; n=30), Focus Group (3.9%; n=4; Table 1). Studies that used more than one methodology in studying Facebook was also included. Conclusions: New terminologies was used to describe Facebook's role in health research with 8 categories. Facebook-based health research is a continuous rapidly growing area funded by numerous funding agencies. Public Health Implications: Future work should concentrate on Communicable and infectious diseases such as COVID-19, Ebola Viral Disease, Lassa Fever, SARS. Secondly issues of privacy and ethical concerns in social media research must be standardized in terms of reporting.

Keywords: Facebook, Systematic Review, Public Health, Infectious Diseases, Social Media

1. Introduction

Public health targets the entire space of wellbeing and health, not only removal of ailments. Many activities are tailored towards people such as health campaigns. Public health programs include the provision of services to citizens such as health service, behavioral counselling and individuals [1]. Prior to the new millennium, health researchers used libraries and repositories of health information to solve medical challenges. Today, health practitioners have confirmed that social media platforms such as Linked in, Instagram, WhatsApp, Twitter and Facebook can also assist in data provision with reference to public health.

Facebook is an American based social media network whose service can be accessed ubiquitously from devices with internet connectivity such as personal computers and handheld devices. Facebook among social media networks provides a distinct enormous big data source for health care researchers because of the just-in-time content and ease of access. Studies have associated social networks with positive and negative impacts [2] on emotional health.

According to Clement [3], Facebook has about 2.5 billion active users as of the fourth quarter of 2019, making it the biggest social network worldwide. During the last quarter of 2019, the company's report stated that 2.9 billion people were using at least one of Facebook's product. According to Pew

[4], 69% of US adults use Facebook, this equates to a wide breadth of demographics. In addition to its potential, Facebook is highly interactive thereby making it a platform for researchers to harness its feature as a sourcing tool or for a particular project or intervention.

Despite the enormous benefit of Facebook, the framework on how it can be used for health research is still undefined [5]. Researchers are seeking to find new ways on how to better understand Facebook's contribution to public health.

This paper presents a detailed systematic review of current relevant literature of public health related research that used Facebook. The researchers focused on characterizing several studies and also developing aggregate codifications. Researchers also evaluated other features of Facebook health research including how Facebook information was accessed and measured the current state of public health research using Facebook. This paper will definitely generate new insights about Facebook related research and identify new opportunities for assessing and monitoring health on social networking sites and platforms.

2. Methods

PRISMA which is an evidence based minimum set of items for reporting in systematic reviews was used for this Facebook-based health research. The researchers carried out a systematic literature review search between November 1, 2019 and December 31, 2019 by searching Google scholar, Scopus, PubMed, Southern University Online Library whose title, abstract or search keywords matched the following search strings: "Facebook AND health," "Facebook and Public Health" "Social media and healthcare", "Facebook and Terminal Diseases". These databases were reviewed for unique articles.

Studies were included if they met the following criteria:

- I. Primary peer-reviewed journal article representing original health research
- II. Methodology and results provided
- III. Facebook was used by authors to obtain at least part of the results

Researchers defined health research as research that refers to many types of scientific investigations that aim to test ideas, answer questions, improve treatment options and increase knowledge about human health according to the World Health Organization. "Health is also a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity,". Conference proceedings, abstracts, briefs, review articles and non-English articles were excluded from the study.

Articles that met the inclusion criteria were assessed using a systematic review quality criteria. Articles were assessed based on techniques, objectives, coding, methodology, discussion and limitations. All authors independently screened studies for inclusion. To describe the current state of Facebook health research, the researchers extracted information such as Authors, year, region and countries, study period, study design, health field, Facebook interventions, successes and challenges.

Researchers used summary statistics to aggregate the frequency of themes used across studies, methodologies of accessing Facebook, Facebook data features reported and measures of the current state of Facebook public health research.

Different metadata elements can be extracted from Facebook, this includes but not limited to Facebook profile, page, language, time-zone, location, number of friends and Facebook post. Other demographic elements are age, gender, marital status, race, interests, religion, income, health status and network.

Facebook as a Methodology

Network Analysis: About one-fifth (16.5%; n=17) of the articles included in this review analyzed Facebook networks, how people use peers to discuss or find solutions to a particular health related issue. These articles discussed how people with serious mental illness report benefits from interacting with peers online from greater social connectedness, feelings of group belonging and by sharing personal stories and strategies for coping with day-to-day challenges of living with illnesses.

Interventions: Some of the articles (12.6%; n=13) analyzed Facebook for interventions based on different health areas. Quite a number of the articles in this category focused on monitoring Facebook for facilitating faster and better access to information and support for caregivers. Others discussed the critical assessment of what each mHealth program offers related to the production of knowledge, a focus on engagement, and attention to social support and social network theory can enhance mHealth and maximize public health impact.

Advertisement: Facebook was used for health-related advertisement in (6.8%; n= 7) of the articles included in this study. The use of Facebook campaign ads helped in reaching a wide range of people who signed up for the lung cancer community and how they could help spread awareness. Millennials found Facebook advertisement successful in keeping up to date with healthcare news.

Survey: Facebook was used to recruit research survey participants in 3% (n=3). One researcher discovered that people with access to the internet through the survey have been able to curb STIs with information gathered.

Content Analysis: Sixteen articles (15.5%) analyzed the content of Facebook post with reference to a specific health topic. One of the researchers found out that Prevalence of displayed marijuana references on Facebook profiles varied from 5% to 10% across 4 years. Displayed marijuana references included most "Actions" and "Locations" on the Facebook profile. Marijuana users were more likely to display marijuana references on Facebook compared to nonusers, though Likes were more common among nonusers. Predictors of displayed marijuana references included lifetime and current marijuana use.

Engagement: Few articles (7.8%; n=8) assessed presence as well as user interactions with consent produced by other users. Researchers in this category reported figures including number of likes on how the Facebook community responded

to posts from different users about different health topics. Participants were able to share important information and exchange social support via Facebook

Recruitment: Facebook was used to recruit participants in 30% (n=30) of the articles included in this study, most of the articles proved that increased total number of Facebook friends, increased time spent per day on Facebook, and increased anxious arousal symptoms were each significantly associated with increased Facebook behavior and increased

repetitive Facebook behavior. Facebook was also found to be a useful, cost-effective method to recruit a diverse sample of parent caregivers of children with cancer.

Focus Group: Of the 3.9% articles (n=4), In a particular study total of 95% of survey respondents reported that joining the group had a positive impact on their care; and 97% reported that their main motivation for joining was to provide or receive support from other patients.

Table 1. Taxonomy of Use of Facebook-Generated Data in Included Articles: 2014-2019.

Use of Facebook	Description	Articles No. (%)	Examples
Network Analysis	Assessing the relationship and interactions between Facebook users about a certain health related matter [6-11]	17 (16.5%)	Mental illness, gender based violence issues
Interventions	Use of Facebook as an intervention in a health-related research study [12, 13]	13 (12.6%)	HIV, behavioral issues
Advertisement	Assessment of Facebook as a tool to create awareness and solve public health challenges through advertising and campaigns [14-17]	7 (6.8%)	Hypertension, maternity
Survey	Use of Facebook to survey participants in an health related research [18, 19]	3 (3%)	STIs, LGBTQ, Anxiety
Content Analysis	Assessment of Facebook posts for themes in relation to a specific health subject	16 (15.5%)	HIV, Drug and alcohol abuse
Engagement	Assessing impact of discussion on Facebook by analyzing presence of an account, number of likes, friends, page followers, etc. [20]	8 (7.8%)	LGBTQ
Recruitment	Use of Facebook to enroll possible patients in health research studies [21]	30 (29%)	HPV, GTD
Focus Group	Enrolling several Facebook focus groups. [22, 23]	4 (3.9%)	HPV, Obesity, Cancer

Facebook metadata: Of several potential Facebook data features carved out for review, only few data features were reported by less than 2% of the studies. Recruitment was the most included in the analysis. Very few studies reported demographics of the Facebook users producing the content.

Current State of Facebook Health Research:

Publication Date: Most articles were recently published with 27% (n=28), published in 2018 compared with only 12% (n=12) in 2014. 2015 and 2016 constituted 35% (n=36).

Research field and topic: The most represented research fields in the review were cancer, Sexually transmitted diseases and obesity.

Research Design: Most studies were analyzed using either qualitative, quantitative and mixed methods.

Funding: A lot of research agencies funded the articles in the included studies. Funding by Governmental bodies constituted 45% of the articles. Many other funding agencies, non-profits and universities were also identified

Discussion

This review has 2 major findings. First, a new classification to describe how Facebook is used in health research consisting of 8 categories: network analysis, interventions, advertisement, survey content analysis, engagement, recruitment and focus group. Secondly, the current state of Facebook in health research was described and a lot of evidence-based elements was discovered. This connotes that there is need increase Facebook related publications each year.

Future Directions in Facebook Research

Facebook-based health research is a rapidly growing area. There is a growing annual increase in number of published articles. We also noticed that Facebook research is supported by global funding agencies and government agencies. The most discussed topics include HIV, mental illness gender issues. Researchers also noted that infectious, communicable and viral diseases such as Ebola, COVID-19, SARS, Lassa

fever were less frequently investigated by the studies included in this review. Whereas chronic diseases such as hypertension, sexually transmitted diseases were largely discussed in Facebook posts. As the use of social media as a data source for public health researchers is emerging, policies regarding privacy and consent of the users producing the message have yet to be universally designed. However, articles included in this study received approvals from their various ethics body or Institutional Review Boards (IRBs).

3. Results

Of the 2506 articles identified in the interim database search, researchers found 727 unique articles. Of these, 103 of these articles met the eligibility criteria (see appendix). Researchers identified ways in which Facebook data were used by other researchers: Network Analysis of Facebook post (16.5%; n=17), Intervention based post (12.6%; n=13), Advertisement (6.8%; n=7), Survey (3%; n=3), Content Analysis (15.5%, n=16), Engagement (7.8%; n=8), Recruitment (29%; n=30), Focus Group (3.9%; n=4; Table 1). Studies that used more than one methodology in studying Facebook was also included.

4. Limitations

This study has some limitations. The inclusion of more databases in the preliminary search would have yielded more results. We also observed that we might have missed some articles that based "Facebook" in search parameters and used articles that mentioned "Social media". We also included only articles in English Language. Future work can focus on research conducted in other languages.

5. Conclusions

Facebook is a valuable resource for health researchers interested in capturing live data about a health topic or harnessing the interactive platform for study recruitment or intervention. Facebook based health research is a growing field as evidenced by the increasing number of publications per year and diversity of funding organizations. This review defined new codification themes to describe Facebook use in health research with 8 categories.

Contributors

F. Aquegho and F. Ayeni originated the study, collected and analyzed data and drafted the article. M. Adewunmi, R. Ayo and T. Ayo aided in the collection of the data and drafting of the article. G. Katchoua, S. Adewole, O. Fawehinmi and V. Mbarika aided in the conceptualization of the study and drafting of the article.

Human Participant Protection

No institutional review board approval was required for this study as there were no human participants.

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