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Review

Use of social media for e-Government in the public health sector: A systematic review of published studies

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ABSTRACT

Although the intersection between social media and health has received considerable research attention, little is known about how public sector health organizations are using social media for e-Government. This systematic literature review sought to capture, classify, appraise and synthesize relevant evidence from four international research databases and gray literature. From 2441 potentially relevant search results only 22 studies fully met the inclusion criteria. This modest evidence-base is mostly descriptive, unidisciplinary and lacks the theoretical depth seen in other branches of e-Government research. Most studies were published in the last five years in medical journals, focus on Twitter and come from high income countries. The reported e-Government objectives mainly fall into Bertot et al.'s (2010) categories of *transparency/accountability*, *democratic participation*, and *co-production*, with least emphasis on the latter. A unique category of *evaluation* also emerged. The lack of robust evidence makes it difficult to draw conclusions about the effectiveness of these approaches in the public health sector and further research is warranted.

1. Introduction

Governments worldwide are beginning to harness the Internet and related Information and Communications Technologies (ICT) in an effort to address citizens' desire for greater information access, institutional transparency, participative decision-making and access to public services. One channel through which these objectives are being pursued is social media, which include off-the-shelf networking sites, such as Facebook, microblogging services, such as Twitter, and information dissemination platforms, such as YouTube (Porumbescu, 2016).

International surveys indicate that four out of five countries now have a national information portal containing links to government social media accounts on platforms such as Facebook and Twitter (UN, 2016). This interest in social media is being driven by the promise of e-Government to "enable stakeholders and government to communicate, collaborate, and engage in governance" (Oliveira & Welch, 2013, p. 397). These stakeholders include, but are not limited to, citizens, employees, non-profit organizations and other arms of government, as described by the taxonomy of social media interactions first developed by Fang (2002).

The health sector represents a critical area of governmental responsibility in most countries, accounting for a major proportion of national spending, equivalent to 9.9% of global Gross Domestic Product in 2014 (World Health Organization (WHO), 2014). Like other parts of the public sector, government departments of health, national agencies charged with monitoring, protecting and improving population health, and state-funded healthcare delivery organisations are under increasing pressure to engage with the e-Government agenda and it is likely that many are using social media specifically in order to do this. While there is a growing body of literature examining social media in health contexts; including aspects of public health communication, promotion and surveillance (e.g. Velasco, Agheneza, Denecke, Kirchner, & Eckmanns, 2014) little has been written about their use for enabling e-Government objectives (see Franco, Tursunbayeva, & Pagliari, 2016 for a discussion). Indeed, it is only recently that scholars have begun to explicitly link the concepts of e-Government, public health and social media; for example, Andersen, Medaglia, and Henriksen (2012) drew on e-Government theories in an exploratory study of the value impacts of social media for the Danish public health system and barriers to achieving these. Given the priority many governments are placing on digital services and the investments being made in social media engagement in the health sector, policy-makers and managers stand to benefit from a timely synthesis of relevant evidence, to guide future practice. Such a synthesis would also add value to the academic e-Government literature, in which healthcare is relatively underrepresented, compared with other public sectors. Our

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study aimed to address this deficit by using the rigorous "systematic review" technique to identify, classify, critically appraise and synthesise the corpus of published research evidence relevant to the adoption, use and impacts of social media for e-Government in the public health sector. In doing so we recognised that relevant articles may not explicitly use all of these terms but it may nevertheless be possible discern an implicit e-Government agenda from studies on the use of social media for delivering public health services (e.g. Thackeray, Neiger, Smith, & Van Wagenen, 2012). In order to facilitate our searches and study interpretation, we drew on the framework developed by Bertot, Jaeger, Munson, and Glaisyer's (2010), which deliniates four classes of social media interactions in the public sector, summarised as democratic participation, co-production, crowdsourcing and transparency/accountability, and Fang's (2002) e-Government taxonomy, both of which are described in detail in the Research methods section.

To the best of our knowledge, this is the first systematic literature review to have specifically investigated the adoption and use of social media by public health organizations, taking the perspective that they are also part of government (Salinsky, 2010).

2. Research methods

2.1. Systematic literature review approach

This form of literature review uses "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing an existing body of completed and recorded work produced by researchers, scholars and practitioners." (Fink, 2010, p. 3). This approach was originally developed as a means of synthesising medical research evidence, but is increasingly used in other fields, such as social, policy and business studies (Stead, Gordon, Angus, & McDermott, 2007). In contrast to other types of literature review (e.g. narrative reviews and scoping reviews), systematic reviews focus on specific research questions with narrow parameters; are guided by inclusion/exclusion criteria set at outset (e.g. topics, settings, study types); extract data only from included studies; evaluate the quality of those studies, and base their conclusions largely on the evidence relating to the initial research question(s) (Armstrong, Hall, Doyle, & Waters, 2011; Holeman, Cookson, & Pagliari, 2016). In order to ensure a transparent and replicable process, we followed the "Preferred Reporting Items for Systematic Reviews and Meta-Analyses" (PRISMA) guidelines (Dekker & Bekkers, 2015; Moher, Liberati, Tetzlaff, & Altman, 2009).

2.2. Search strategy

The search strategy and inclusion criteria were informed by a scoping review, which helped to define the concepts of public health (mindful of international differences), e-Government and social media, and the nexus between them (see Franco et al., 2016).

Four international research databases, covering the health, technology, business and social science disciplines (Cochrane Library, MEDLINE, Scopus and Web of Science Core Collection), were interrogated on July 12, 2015. The broad search query was constructed as follows: ("e-government" OR "government" OR "department" OR "organization" OR "agenc*" OR "hospital*" OR "clinic*") AND ("social media" OR "Facebook" OR "Twitter" OR "YouTube") AND ("health" OR "healthcare").

In addition to academic databases, we searched WHO reports and working papers (via WHO's Institutional Repository for Information Sharing) utilizing the same keywords used to search the online academic databases.

The reference lists of articles included in the final set were searched by hand (an approach also known as "snowballing"), as a means of checking for additional studies that may not have been indexed in the online research databases (Yeager et al., 2014).

2.3. Article screening and selection

All outputs were stored in EPPI-Reviewer 4 software, where they were first screened independently by the first author, based on their titles and abstracts. Full text versions of articles appearing to meet the inclusion criteria were obtained for further screening. The third author iteratively checked samples of the assessed articles to ensure consistency with the inclusion and exclusion criteria. This allowed for ambiguities or uncertainties to be discussed and addressed at an early stage, so that consensus could be reached between reviewers. Remaining disagreements were referred to the second author for arbitration.

2.3.1. Inclusion criteria

- Academic or commercial (consultancy) research with a primary focus on the adoption and use of social media by public sector health organizations, at the regional or national levels, for interacting and enabling transactions with other governmental bodies, businesses or citizens, as part of a broader "e-Government" agenda. For example, studies focusing on social media adoption by government departments of health, regional health authorities, government-funded healthcare delivery organisations or national public health agencies.
- Studies published in any language between January 1, 2004 and July 12, 2015. The year 2004 has been chosen as a starting point, since this was when Facebook, the most widely used social media website, was created.

2.3.2. Exclusion criteria

- Studies focused on private sector health organizations.
- Studies focused on individual departments or specialites within public sector health organizations, such as emergency departments, cardiology services or diabetes clinics; for example, to enable a social support group, network with professional colleagues or send targeted messages to patients. This review, in contrast, concerns activities undertaken at the wider organizational level and aimed at enabling information exchange or transactions between public health organizations and other parts of government, citizens or businesses (e.g. Gazley & Guo, 2015).
- Studies primarily focused on the use of social media for health surveillance or research.
- Studies published before January 1, 2004.

The specific study inclusion and exclusion criteria are shown in Textbox 1.

2.4. Critical appraisal of study quality

As per systematic review requirements, the quality of the included studies was rated using the Critical Appraisal Skills Programme (CASP, 2013) checklist, which was slightly modified by adding a "not clear" (0.5) option for each item to the standard "yes" (1) or "no" (0) (These modifications are common in systematic reviews; for example, see Tursunbayeva, Bunduchi, Franco, & Pagliari, 2016). The first author assessed all the eligible studies, while the third author independently assessed a random sample in order to appraise inter-rater consistency and resolve any ambiguities. This exercise revealed only very minor discrepancies, therefore further secondary assessment by the third author focused only on studies that the first author was unsure of. The table derived from the quality assessment exercise is shown in Appendix A.

2.5. Data extraction and thematic analysis

The first author extracted information from all eligible studies with