Opportunities and challenges of social media for health knowledge management: A narrative review
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Abstract:
INTRODUCTION: Social media is becoming a new tool for developing health knowledge management. However, despite the rapid growth of research in this area, few attempts have been made to review previous research. This study tried to summarize the opportunities and challenges of using social media to managing health knowledge.

METHODOLOGY: This article used a narrative approach to collect and review studies. In this review, published documents during 2010–2019 were retrieved by search in the following three electronic scientific databases: Web of Knowledge, PubMed, and Google Scholar search engine using keywords including social media, public health, health knowledge, knowledge management, and health promotion.

RESULTS: Social media by overcoming geographical barriers, developing health promotion, facilitating decision-making, and providing public health education has been able to enhancing health awareness and improving health behavior. Doctors' unwillingness to interact with the public, lack of compliance with the principles of medical ethics, users' privacy concerns, and difficulty of managing negative comments are the four challenges to health knowledge management in social media.

CONCLUSION: Social media can be a suitable tool for developing health knowledge management processes if medical professional ethics and users' privacy managed properly.

Keywords:
Health communication, health knowledge, health promotion, knowledge management, public health, social media, technology

Introduction
The World Health Organization has addressed the goal of knowledge management as filling the knowledge gap between different countries and has defined its activities on the basis of three pillars including: people, processes, and technologies.¹² People are those who create, disseminate, and use knowledge.¹³ Processes include ways of acquiring, creating, organizing, sharing, and transferring knowledge.¹¹ Technologies also include mechanisms that enable people to store and access data, information, and knowledge generated by people in different geographical locations.¹¹,¹³ In health knowledge management, information generated by physicians, specialists and health centers, and also the presence of the general public has importance as knowledge consumers.¹³,¹⁴

Health knowledge management refers to the generation, modeling, sharing, using, and translation of knowledge to improve the quality of patient care and to better manage medical and health problems. The goal of health knowledge management is to provide, disseminate, and deliver knowledge to medical professionals, patients, and individuals at the right time.
and place.\textsuperscript{[7]} In fact, health knowledge management seeks to utilize appropriate solutions based on the integration of information and communication technologies and health workflows to improve quality and increase efficiency and better effectiveness of health-care delivery.\textsuperscript{[8]}

Some previous studies have shown that health knowledge management can be supported by a range of technologies such as social media.\textsuperscript{[9–15]} Some other studies have considered various challenges of social media applications in health knowledge management.\textsuperscript{[16–19]} Despite several related studies separately, there is still a lack of a review synthesizing the findings of previous research to provide evidence of the opportunities and challenges of social media for health knowledge management. Therefore, the current review was designed to address this gap. The objective of this study is to review the literature and identify the different impacts of social media in health knowledge management processes and summarize the results of previous related studies. The findings of this study could be providing an opportunity for physicians, health policy-makers, health service providers, and information technology activists to better understand the impact of social media for health knowledge management.

**Methodology**

In this narrative review, we assessed published articles in two scientific databases including PubMed and Web of Science and in Google Scholar, as a common scientific search engine, using the different combinations of two term groups. The first group of selected keywords includes “social media,” “web 2.0,” “social network,” “weblog,” “wiki,” “podcast,” “forum,” “content community,” and “microblog.” The second group of selected keywords includes “health knowledge management,” “health-care knowledge management,” “public health,” “health knowledge,” and “health promotion.”

The inclusion criteria were: (1) the use of social media has been studied in at least one of the stages of health knowledge management including knowledge acquisition, knowledge organization, knowledge dissemination, and knowledge application; (2) empirical studies that answered the research questions or tested the hypothesis and conducted on specific population and sample; (3) journal articles; and (4) published between 2010 and 2019. The exclusion criteria were: (1) none of the roles of social media are considered; (2) presenting an outcome unrelated to any stage of knowledge management; (3) duplicates; (4) not in English; (5) conference papers, book sections, and other formats (except journal articles); and (6) unknown methodology (the population, the sample, the data collection tool, or the method of data analysis has not been stated).

**Results**

Initially, 370 studies were extracted from the literature search. Ninety-two studies were removed as they were duplicated studies. From the remaining articles, 263 were excluded after assessing the title and abstract and considering inclusion and exclusion criteria. Finally, after reviewing the references of the remaining articles and adding related studies, 17 studies were selected for the final review. The findings of this study were classified into three categories including barriers to health knowledge management implementation, social media opportunities for health knowledge management, and health knowledge management challenges in social media. Each of these categories is explained below.

**Barriers to health knowledge management implementation**

Proper implementation of health knowledge management processes can reduce physicians’ and patients’ mistakes and speed up problem-solving.\textsuperscript{[20,21]} Some of the barriers for knowledge management in health-care organizations overlap with those in other areas. For example, the lack of a well-established strategy, the lack of a proper knowledge sharing culture, and poor information technology infrastructure are among the barriers to health knowledge management.\textsuperscript{[22,23]}

Various factors such as the high growth of health information and knowledge production, health communication problems, and interaction issues between patients and physicians have posed other challenges for health knowledge management.\textsuperscript{[24]} Another challenge for health knowledge management is the resistance of medical professionals to the adoption of new technologies. Most of the health professionals have imagined that some clinical processes are at risk when they use new technologies.\textsuperscript{[25]}

Excessive specialization was other factors that have created limitations for the use of health knowledge management approaches that can disrupt the cycling of knowledge and information. Accordingly, physicians’ resistance to acceptance of knowledge management can be attributed to their motivations for engaging in alternative approaches to knowledge leadership.\textsuperscript{[26]}

Political interference is another barrier to health knowledge management. Medical networks, originally founded for the purpose of knowledge sharing, are rapidly becoming tools for achieving management goals. Furthermore, while physicians are concerned about
improving patient care, managers emphasize reducing current costs and increasing revenues.\textsuperscript{[27]}

**Social media opportunities for health knowledge management**

Despite arisen concerns about the use of social media for health promotion, such as maintaining information security and violating patients’ privacy, the use of these tools for health knowledge management can have some benefits.\textsuperscript{[28]} Delivering the responsibility of patient care to the patient itself, providing opportunities for patients and physicians to share their viewpoints and experiences, increasing the control of diseases through enhancing personal capabilities to take care of health, improving decision-making, and correcting dangerous health behavior are from among the benefits of the use of social media.\textsuperscript{[29]}

Overcoming geographical barriers, sharing information, expanding collaboration, and improving shared decision-making in patient care processes can be mentioned as the most obvious roles of social media for facilitating health knowledge management.\textsuperscript{[30,31]} The use of social media, by facilitating knowledge acquisition, information sharing, and clinical decision support, has accelerating delivering health care.\textsuperscript{[32]}

Some wrong behaviors of health users can be changed with the use of social media, and one-way communication has given its place to interactive conversations. Patients’ trust in doctors on social media has led to increased health information dissemination. Using social media, physicians have been able to answer more questions from users.\textsuperscript{[33-35]} Through social media, by seeing the other similar experiences, patients’ motivations to pursue treatment have increased. Social media has also been able to provide a tool for understanding patients’ needs and evaluating health-care service quality.\textsuperscript{[36,37]}

Virtual communities and social networks between patients with similar status can make the patient more aware of his/her condition. Asking questions and sharing the experiences of people during the course of the illness can increase other patients’ awareness of their problems and provide solutions to better decision-making in similar situations.\textsuperscript{[38,39]} In addition to the use of public social media tools, many media designed, especially for health, and delivered for the use of physicians and patients. For example, the three social networks, Medical Mingle, MyMedPort, and Ozmosis, are medical social media tools designed for physicians which are accepted by a wide range of users. Furthermore, some social networks such as CheckMd and “My Family Health” have also provided a wide range of options for patients for better health management.\textsuperscript{[40]}

**Health knowledge management challenges in social media**

The findings of the present study identified four challenges for health knowledge management in social media, including unwillingness of physicians and health organizations to interact with the public, endangering medical ethics by some nonspecialist users, patients’ privacy, and negative patient comments.\textsuperscript{[41-43]}

Although social media can facilitate health communication and interactions, in many cases, health organizations and physicians only use it to inform and insist on maintaining one-way relationships. Another challenge in health media management in social media relates to the inability to control messages, and there are always concerns about negative comments, messages and conversations being distorted, and misinterpretations of others’ opinions.\textsuperscript{[44-46]} Another challenge of health knowledge management is the generalizability of social media users’ behavior to the whole community. It should be noted that a great number of patients are not able to use social media for various reasons.\textsuperscript{[53]} The participatory nature of social media and the openness of information exchange increasing incorrect information disseminate on social media compared with other media.\textsuperscript{[50]}

**Discussion**

Based on the findings of the present study, the use of social media can provide opportunities to facilitate health knowledge management. Social media enables health stakeholders to gain more knowledge by sharing experiences, sharing opinions, expanding relationships with colleagues, and acquiring new scientific findings.\textsuperscript{[54,55]} Using social media can be an opportunity to develop health-care knowledge at both the individual and organizational levels by facilitating health communication, accelerating health knowledge sharing, and supporting decision-making through the formation and participation in social networks.\textsuperscript{[56]}

Although literature reported that social media have considerable potential health promotion and education, like traditional health promotion media, health-related activities in social media must be properly planned. Otherwise, social media may not always achieve the desired results in health context.\textsuperscript{[57]} Obviously, if an organization uses social media to promote health, appropriate monitoring and evaluation indicators should also be provided.\textsuperscript{[58]}

**Conclusion**

The findings of this study showed that social media can facilitate health knowledge management processes if medical professional ethics and patients’ privacy...
managed carefully. Due to the lack of proper national and international policy on the proper use of social media, further scientific research is needed to identify the different dimensions of social media use in health knowledge management.

This study has limitations. First, the full text of some related articles was not accessible. The heterogeneity of study populations in the analyzed studies was the second issue. Third, in some studies, the descriptive statistics about the situation of using social tools for health knowledge management were rarely mentioned. Fourth, some studies lacked considering health knowledge management subprocesses, thereby leading to limitations in synthesizing the results of these studies.

Based on the results of the current review, the authors suggest these practical topics: (1) it is recommended that each of the health stakeholders develops appropriate implementation strategies based on the use of social media to developing health knowledge management; (2) it is recommended that expert committees, including information technology professionals, physicians, and medical information experts, created and developed suitable codes of conduct for health users to safely engage in social media; and (3) it is recommended for health organizations to design quality assurance labels to tag authenticated and approved activities on social media.

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Conflicts of interest
There are no conflicts of interest.

References
1. Wigg K. Knowledge Management Foundations. Arlington: Schema Press; 1993.
2. Bolarinwa O, Salaudeen A, Akande T. Overview of knowledge management applications in health care delivery of developing countries. Acad Res Int 2012;3:38.
3. Beveren VJ. A model of knowledge acquisition that refocuses knowledge management. J Knowl Manag 2002;6:18-22.
4. Candy P. Healthcare Knowledge Management: Issues, Advances and Successes. New York: Springer Science & Business Media; 2010.
5. Abidi SS. Healthcare knowledge management: The art of the possible. In: Knowledge Management for Health Care Procedures. Berlin, Heidelberg: Springer; 2008. p. 1-20.
6. Andreadis JD, Schieber RA, Liebowitz J. Knowledge management and public health: A winning combination. In: Knowledge Management in Public Health. Boca Raton: CRC Press; 2009. p. 43-60.
7. Vance K, Howe W, Dellavalle RP. Social internet sites as a source of public health information. Dermatol Clin 2009;27:133-6.
8. Bali R, Troshani I, Goldberg S, Wickramasinghe N. Pervasive Health Knowledge Management. New York: Springer; 2013.
9. Ford DP, Mason RM. A multilevel perspective of tensions between knowledge management and social media. J Organ Comput Electron Commerce 2013;23:7-33.
10. Hemsley J, Mason RM. The nature of knowledge in the social media age: Implications for knowledge management models. In: System Science (HICSS), 2012 45th Hawaii International Conference. IEEE; 2012.
11. Hemsley J, Mason RM. Knowledge and knowledge management in the social media age. J Organ Comput Electron Commerce 2013;23:138-67.
12. Jarrah MH, Sawyer S. Social technologies, informal knowledge practices, and the enterprise. J Organ Comput Electron Commerce 2013;23:110-37.
13. Lawton G. Knowledge management: Ready for prime time? Computer 2001;34:12-4.
14. Nissen ME, Bergin RD. Knowledge work through social media applications: Team performance implications of immersive virtual worlds. J Organ Comput Electron Commerce 2013;23:84-109.
15. Zheng Y, Li L, Zheng F. Social media support for knowledge management. In: 2010 International Conference on Management and Service Science. China: Wuhan; 2010.
16. Househ M, Borycki E, Kusniruk A. Empowering patients through social media: The benefits and challenges. Health Inform J 2014;20:50-8.
17. Lim WM. Social media in medical and health care: Opportunities and challenges. Marketing Intelligence Planning 2016;34:964-76.
18. Keller B, Labrique A, Jain KM, Pekosz A, Levine O. Mind the gap: Social media engagement by public health researchers. J Med Internet Res 2014;16:e8.
19. Brusse C, Gardner K, McAullay D, Dowden M. Social media and mobile apps for health promotion in Australian Indigenous populations: Scoping review. J Med Internet Res 2014;16:e280.
20. Morr EC, Subercaze J. Knowledge management in healthcare. In: Handbook of Research on Developments in E-health and Telemedicine: Technological and Social Perspectives. Hershey: Information Science Reference; 2010. p. 490-510.
21. Hosnavi R, Akhavan F, Sanjeghi M. Knowledge Management Critical Success Factors. Tehran: Atinegar; 2010.
22. Riege A. Three-dozen knowledge-sharing barriers managers must consider. J Knowl Manage 2005;9:18-35.
23. Sensky T. Knowledge management. Adv Psychiatr Treat 2018;8:387-95.
24. Alajini BM, Marouf LN, Chaudhry AS. Knowledge management for healthcare: Investigating practices that drive performance. J Inf Knowl Manag 2016;15:1650014.
25. Guah MW, Currie WL. Factors affecting IT-based knowledge management strategy in UK healthcare system. J Inf Knowl Manage 2004;3:279-89.
26. Ferlie E, Fitzgerald L, Wood M, Hawkins C. The nonspread of innovations: The mediating role of professionals. Academy of Management Journal 2005;48:117-34.
27. Addicott R, McGivern G, Ferlie E. etworks, organizational learning and knowledge management: NHS cancer networks. Publ Money Manag 2006;26:87-94.
28. Norman CD. Social Media and Health Promotion. London, England: Sage Publications Sage UK; 2012.
29. Swan M. Health 2050: The realization of personalized medicine through crowdsourcing, the quantified self, and the participatory biocitizen. J Pers Med 2012;2:93-118.
30. Emmanuel S, Day K. Using social media to facilitate patient-provider interaction. Health Care Inform Rev Online 2011;15:23-30.
31. Kaplan AM, Haenlein M. Users of the world, unite! The challenges and opportunities of Social Media. Bus Horiz 2010;53:59-68.
32. Bordoloi P, Islam N. Knowledge management practices and healthcare delivery: A contingency framework. Electron J Knowl Manage 2012;10:110-20.
33. Aitken M, Altmann T, Rosen D. Engaging patients through social media. In: IMS Institute for Healthcare Informatics, Tech. Rep; 2014.
34. John B, Gururajan R, Wickramasinghe N. The prevalence of social question answering in health-care social media. In: Contemporary Consumer Health Informatics. Heidelberg: Springer; 2016. p. 235-51.
35. Andersen KN, Medaglia R, Henriksen HZ. Social media in public health care: Impact domain propositions. Gov Inf Q 2012;29:462-69.
36. Courtney K. The use of social media in healthcare: Organizational, clinical, and patient perspectives. In: Enabling Health and Healthcare Through ICT: Available, Tailored and Closer. Vol. 183. Washington, DC: IOS Press; 2013. p. 244
37. Dredze M. How social media will change public health. IEEE Intell Syst 2012;27:81-4.
38. Kordzadeh N. Social media in health care. In: Contemporary Consumer Health Informatics. Heidelberg: Springer; 2016. p. 101-23.
39. Singh JB, Chandwani R, Kumar M. Factors affecting Web 2.0 adoption: Exploring the knowledge sharing and knowledge seeking aspects in health care professionals. J Knowl Manage 2018;22:21-43.
40. Sarasohn-Kahn J. The Wisdom of Patients: Health Care Meets Online Social Media. Oakland: California HealthCare Foundation; 2008.
41. Abidi SS, Hussini S, Sirraj W, Thienhong S, Finley GA. Knowledge sharing for pediatric pain management via a Web 2.0 framework. Stud Health Technol Inform 2009;150:287-91.
42. Fareedi AA, Hassan S. The impact of social media networks on healthcare process knowledge management (using of semantic web platforms). In: 2014 14th International Conference on Control, Automation and Systems (ICCAS 2014). IEEE; 2014.
43. McKee R. Ethical issues in using social media for health and health care research. Health Policy 2013;110:298-301.
44. Raymond L, Paré G, Maillet É. IT-based clinical knowledge management in primary health care: A conceptual framework. Knowl Process Manag 2017;24:247-56.
45. Wickramasinghe N, Davey B, Tatnall A. Web 2.0 panacea or placebo for superior healthcare delivery?. In: Pervasive Health Knowledge Management. New York: Springer; 2013. p. 317-30.
46. Heldman AB, Schindeler J, Weaver JB. Social media engagement and public health communication: Implications for public health organizations being truly “social”. Public Health Rev 2013;35:13.
47. Hart M, Stetten N, Castaneda G. Considerations for public health organizations attempting to implement a social media presence: A qualitative study. JMIR Public Health Surveillance 2016;2:e6.
48. Huang YC, Lin YP, Saxton GD. Give me a like: How HIV/AIDS nonprofit organizations can engage their audience on Facebook. AIDS Educ 2016;28:539-56.
49. Thackeray R, Neiger BL, Burton SH, Thackeray CR. Analysis of the purpose of state health departments’ tweets: Information sharing, engagement, and action. J Med Intent Res 2013;15:e255.
50. Guidry JP, Jin Y, Orr C, Messner M, Meganck S. Ebola on Instagram and Twitter: How health organizations address the health crisis in their social media engagement. Public Relations Review 2017;43:477-86.
51. Hacker J, Wickramasinghe N, Durst C. Can health 2.0 address critical healthcare challenges? Insights from the case of how online social networks can assist in combatting the obesity epidemic. Aust J Inform Syst 2017;21:1-17.
52. McCaughhey D, Baumgardner C, Gandes A, Larochelle D, Wu KJ, Raichura T. Best practices in social media: Utilizing a value matrix to assess social media’s impact on health care. Social Science Computer Review 2014;32:575-89.
53. Shan LC, Panagiotopoulos P, Regan A, De Brún A, Barnett J, Wall P, et al. Interactive communication with the public: Qualitative exploration of the use of social media by food and health organizations. J Nutr Educ Behav 2015;47:104-8.
54. Lau AY, Siek KA, Fernandez-Luque L, Tange H, Chhanabhai P, Li SY, et al. The role of social media for patients and consumer health. Contribution of the IMIA Consumer Health Informatics Working Group. Yearb Med Inform 2011;6:131-8.
55. Liebowitz J. The hidden power of social networks and knowledge sharing in healthcare. In: Healthcare Knowledge Management. New York: Springer; 2007. p. 104-11.
56. Neiger BL, Thackeray R, Burton SH, Giraud-Carrier CG, Fagen MC. Evaluating social media’s capacity to develop engaged audiences in health promotion settings: Use of Twitter metrics as a case study. Health Promot Pract 2013;14:157-62.
57. Korda H, Itani Z. Harnessing social media for health promotion and behavior change. Health Promot Pract 2013;14:15-23.
58. Neiger BL, Thackeray R, Van Wagena SA, Hanson CL, West JH, Barnes MD, et al. Use of social media in health promotion: Purposes, key performance indicators, and evaluation metrics. Health Promot Pract 2012;13:159-64.