Social Media as a Tool in Medicine

Digital Social Networks and Health

R. Craig Lefebvre, PhD; Alexandra S. Bornkessel, MA

This article documents the emergence of social media, and specifically social network sites (SNS) and their impact on health information-seeking and health-related behaviors. We review surveys of user behavior on SNS to document how health information is being transformed into a social health experience rather than an individual or clinical endeavor. We then turn to the research evidence for how SNS may influence health behaviors. Although there is a substantial literature that provides support for the role of social variables in the genesis and management of health and disease, there is little scientific grounding for how to leverage these variables to improve health in either online or offline milieus. We conclude with recommendations for practice to optimize the use of social media and its contribution to improved health outcomes, and pose a series of questions that may guide the development of a research agenda in this area.

The technological innovations of blogs, podcasts, interactive media, and SNS have enabled many people to create, post, and share their own messages and content by using a variety of digital social communication tools and platforms. People and organizations can now quickly create and deliver content through more interactive Web sites and online communities where, for example, people with medical conditions can seek, give, and receive advice from other patients and healthcare providers. New communication technologies and the emergence of what has been dubbed Web 2.0 are providing the opportunity for health professionals and patients alike to engage with one another, their peers, friends, and families in ways unimaginable just a few years ago. The speed and scale of adoption of social media is changing the way we think about and communicate with people formerly known as audiences and the way doctors and patients interact, bringing about a new social health experience. Yet, these social media and interactive elements have been poorly integrated into many health-related Web sites, for example, those dedicated to tobacco control.

In its simplest forms, these media can be thought of as digital extensions of the interpersonal channels of connection and the narrowing of broadcast-type communication. They are increasing access to, connection with, and discussions of health information. The information is no longer static, but alive and moving—weaving through networks of individuals and communities whether on- or offline. Thinking about these new media as just new communication channels misses the essence of what the new revolution is all about: using media in new ways. In this article, we review how people are using the Internet, social media, and specifically SNS in health and medicine to create a new social health experience.

Health Information and the Internet

As of August 2012, data from the Pew Internet & American Life Project found that ~85% of all US adults use the Internet. These usage figures are equal for men and women (83% and 82%, respectively); show greater use by whites (84%) than by blacks and Hispanics (77% and 75% each); are age-related with 97% of people aged 18 to 29 years online versus 77% of people aged 50 to 64 years, and 53% of people over the age of 64; are associated with household income level (71% in households with annual income <$30000/year versus 93% and higher once household income exceeds $50000/year); and also vary by educational level from 58% among people with less than a high school education to 95% among people with college degrees and higher. Among teenagers, the comparable figures exceed 90% for sexes, all age groups, household income levels, and race/ethnicity, with the exception of Hispanics, where Internet use is reported to be 88%.

Several surveys have documented the use of the Internet for health information seeking among adults. Tu reported that, in 2010, 58% of all American adults had searched for health and medical information online in the past year. Among those adults who report being online, the figure for that same year rises to 85%. Another nationally representative survey of 8745 US adults conducted during the third quarter of 2011 found that the average US adult seeks online health information about 3 times per month. The most popular health Web sites visited as of December 2012 were reported by eBizMBA to be (with unique monthly visitors in parentheses) Yahoo! Health (21.5 million), National Institutes of Health (20 million), WebMD (19.5 million), MedicineNet (10.5 million), and MayoClinic (7 million). Although it is not known how many of these visitors to health Web sites are unique individuals or are the same people accessing 2 or more sites in a single search, what is clear is that many millions of people are regularly turning to Web sites for health and medical information. With the rise of mobile phone and tablet ownership there is also increasing use of these devices for health information search; nearly 1 in 3 cell phone users have used their phone to search for health information. Health information search is becoming an anywhere, anytime activity. How people use the information they find through these searches has been the focus of several investigations. In a nationally representative survey of 17000 US adults, Tu found that 56% of the people who had searched for health information on the Internet reported that the information affected their overall approach to maintaining their own health, and 60% said that the information affected their
understanding about how to treat an illness or condition. More specifically, respondents reported that the information they found influenced:

- Whether they asked their doctor a question (51%).
- Making changes in their approach to diet, exercise, or stress management (50%).
- Whether to see a doctor (43%).
- The way they coped with a chronic condition or managed pain (38%).
- Their decision about seeking a second opinion from another doctor (20%).

The online health experience is not just confined to an individual’s self-interests and concerns; 1 in 5 adult Internet users have gone online to find others with health concerns similar to their own. Going a step further, Fox found that almost half (48%) of users who go online for health information do so on behalf of someone else. The significance of this latter finding is that even people who do not have access to the Internet may be affected by the online behaviors of others who know or care for them.

### The Rise of Digital Social Networks

The review of Internet use for health information seeking, especially as it involves others (a social health experience), provides a backdrop to our focus on the use of SNS: online platforms that facilitate creating and maintaining social networks and relationships among people who share particular interests, activities, backgrounds, or real-life connections. Another term for these types of sites is social-networking sites. In referring to SNS, we follow Boyd and Ellison, who distinguish between social-networking sites in which initiating relationships between strangers is a major activity (such as on dating sites) and SNS that allow people to make their networks visible to others. On many of the larger SNS, they note that most communications are among people who are already part of their extended social networks, online and offline.

A SNS usually consists of a profile page for each user, their links with other people on the site, methods to communicate with each other, and a variety of additional services. The emergence of SNS is partly driven by new technologies; however, the Internet has facilitated social interactions since its earliest years with bulletin boards, usenet discussion forums, live chatrooms, and, of course, email. By 2004, Yahoo! Groups had ≈25000 electronic support groups listed in its health and wellness section. Indeed, the primary benefit people give for using the Internet is to tap into their social networks.

As the Figure displays, the rise in the use of SNS among Internet users has been dramatic; in 2005, <10% of any age group on the Internet reported using a SNS, and by 2012, over half of all people aged 50 to 64 years and a third of people over the age of 65 were using SNS. Two-thirds of all Internet users say they use at least 1 SNS.

Duggan and Brenner reported the demographic characteristics of the users of SNS (see Table). Statistically significant differences were found for sex, with women more likely to be users than men (71%–62%); age differences predictably favored younger age groups being more involved in SNS; and people living in urban areas were more likely than people living in suburban or rural areas to be using SNS. No differences in SNS use were noted for race/ethnicity, education attainment, or household income.
Facebook dominated SNS use in this survey: 67% of SNS users were on Facebook that was especially popular with women and adults aged 18 to 29 years (although 57% of people aged 50 to 64 years and 35% of people aged 65+ were using it as well). Twitter was used by 16% of Internet users, especially the group aged 18 to 29 years, blacks, and urban residents. Women, adults <50 years of age, whites, and people with some college education or an annual household income >$50,000 were more likely to use Pinterest (overall, it was used by 15% of all Internet users). The use of Instagram was reported by 13% of Internet users, and was especially appealing to the group aged 18 to 29 years, blacks, Latinos, women, and urban residents.17

Various sources of data confirm the overall popularity of various SNS, yet the numbers can be confusing. For example, as of December 2012, the most popular SNS as measured by estimates of unique monthly visitors worldwide were Facebook (750 million), Twitter (250 million), LinkedIn (110 million), MySpace (70.5 million), and Google Plus (65 million).18 When only unique visitors from the United States are considered, the figures are substantially lower: Facebook (149,135,000), LinkedIn (430,020,000), Twitter (40,840,000), Tumblr (29,369,000), MySpace (28,829,000), Pinterest (26,739,000), and Instagram (26,425,000).19 These visitor figures differ from data provided by the companies themselves; for example, Facebook reports 1 billion active users, Google Plus has >400 million members and 100 million active monthly users, and LinkedIn has >187 million members. Even using the most conservative figures, they dwarf those for health Web sites.

Who Uses SNS for Health?
No one presumes that all SNS users are talking about health and medical issues, but it is clear that these sites are being taken seriously by many health professionals and organizations in health care, from how they may be harnessed for health communication, disease prevention and management; involve patients in their own behavior and disease management or support networks; to stimulate changes in healthcare practice and healthcare systems.1,20,21 A 2012 survey of 1040 US adults found that ≈33% are using SNS like Facebook and Twitter to obtain health information and track and share symptoms.22 More than 80% of respondents aged 18 to 24 years said they are likely to share health information through social media sites, compared with 45% of respondents aged 45 to 64 years.

Consumer or patient use of SNS is only 1 aspect of the social health experience; healthcare professionals are also engaged with these new technologies as well. AMN Healthcare conducted a survey of social media use among healthcare professionals and found that 48% said that they are using some type of social media Web site for professional purposes. The most popular social media sites were reported to be Facebook (used by 41% of the respondents), YouTube (29%), LinkedIn (23%), Twitter (11%), and Foursquare (3%).23

Why Are People Using SNS?
If nearly half of all US adults are using SNS such as Facebook, Twitter, MySpace, and LinkedIn, what is their appeal or attraction? Approximately two-thirds of SNS users say that staying in touch with current friends and family members is a major reason they use these sites, whereas half say that connecting with old friends they have lost touch with is a major reason behind their use of these technologies.24 Other factors play a much smaller role: 14% of users say that connecting around a shared hobby or interest is a major reason they use SNS, and 9% say that making new friends is equally important. Just 5% and 3% of SNS users, respectively, say they read comments by public figures and find potential romantic partners.25

When it comes to health and medical issues, however, the appeal of SNS is very different; only 6% of Internet health information seekers go to an SNS. 11% report visiting a patient online community, and 48% said they go to a medical Web site such as WebMD.26 Healthcare professionals who use social media for work-related purposes do so to access healthcare-related education (54%), share research or articles with colleagues (33%), and communicate with employers (18%). Only 8% said they use social media at work to connect with patients.23 What these data make clear is that SNS sites are not sought out by people primarily for the health and medical information they can provide. Instead, social media are used as a tool to find and connect with people and to build and maintain relationships with people in similar circumstances. Among healthcare professionals, there is minimal use of social media to nurture and extend relationships with patients.

What Are They Doing With Social Media?
As we noted at the beginning of the article, social media are more than SNS sites. And as we just saw in the last section, SNS are not used primarily for health and medical information discovery or sharing. However, there are other social aspects of the medical and health information space that are important to keep in mind. For example, when asked how they have used social media for health-related purposes:

- 42% of respondents said they have used social media to look up consumer reviews of health treatments or physicians;
- 30% said they have supported a health cause through social media;
- 25% said they have shared their own health experiences on social media Web sites; and
- 20% said they have joined a health forum or online health community.22

Social media have been found to potentially influence people’s health decisions:

- 45% of respondents said health information obtained through social media sites would cause them to seek a second opinion;
- 41% said social media sites would influence their choice of a specific physician, hospital, or medical facility;
- More than 40% said health information on social media sites would affect how they manage a chronic condition or approach diet and exercise routines; and
- 34% said social media Web sites would affect their decision to take certain medications.22
Posting and searching for health and medical information on one’s personal Facebook or Twitter account is a way to create a social health experience. As noted above, many people elect to engage with dedicated health sites such as are found on WebMD, Yahoo! Groups, and PatientsLikeMe or sponsored by various nonprofit and corporate organizations (American Diabetes Association, dLife, Mayo Clinic, and ObesityHelp). Some SNS users create their own communities around health topics and specific disease states. For example, a recent search of Facebook and Twitter found 216 breast cancer groups, 171 colorectal cancer groups, and 527 diabetes mellitus groups, with the largest percentage of them (~25%) focused on prevention or research issues. In addition, there are hundreds of other SNS that focus broadly on medical and health topics or selectively on a specific health or medical issue that are created using blogs, wikis, SNS platforms such as Ning, and other social media tools.

**Evidence for the Effectiveness of SNS for Improving Health**

Research strongly links various properties of the social environment (eg, the diversity of one’s social networks, structural characteristics of these networks, the degrees of separation between people, the number of close social contacts, the provision of social support, social influence, access to resources, reducing social isolation) to both psychological and physical health and to the practice of high-risk behaviors, as well. These findings are used by many proponents to justify the use of social media and SNS in disease prevention, detection, and treatment. Indeed, online communities are full of stories that attest to the ability of social media sites to deliver on these promises.

A few experimental studies have documented a causal relationship between social networks and health in either the online or real-world context. That is, there is very little empirical evidence on which to base the assertion that changes in the properties of one’s social environment lead to improved behavioral and health outcomes. In particular, the use of online social networks for health improvement has received limited research attention. There have been several compilations of case studies in which social media have been used to improve health behaviors including antidrug use, human immunodeficiency virus prevention and testing, physical activity, prevention of teen pregnancy, reckless driving, and increasing sustainable food practices among adults. Only one of these projects reported survey-based outcomes that found significant, positive short-term effects on parents’ self-efficacy about talking with their children about sexual activity, actually speaking with them about sexual activity, and recommending to their children that they wait to have sex.

Eysenbach et al conducted an extensive review of this literature and found only 6 studies that focused on what they termed pure peer-to-peer interventions, with another 32 that used online social networks as 1 component of a more complex intervention. They found little evidence that participation in peer-to-peer social-networking communities was associated with a change in health outcomes. More recently, Schein et al conducted a systematic literature review and identified only 1 controlled intervention study on social media and health outcomes and it failed to isolate the impact of social media in a larger communication campaign. Since that review, Napolitano et al conducted a small randomized clinical trial of weight loss program delivered through a private Facebook group, a similar Facebook group plus text messaging and personalized feedback, and a wait list control condition among college students. At 4- and 8-week follow-up, participants in the Facebook Plus group had significantly more weight loss than members of either the Facebook or wait list comparison groups. The difference in weight loss between the latter 2 groups was not significant. Cavallo and colleagues conducted an randomized clinical trial with 134 female undergraduate students comparing a Web site-based physical activity program with one enhanced with a Facebook group. Neither perceived social support for physical activity nor self-reported levels of physical activity differed between the 2 groups at 10- and 12-week follow-ups. An interesting, and cautionary, observation is that, in both of these studies, the participants gave very high satisfaction ratings to the Facebook intervention. However, this satisfaction did not lead to improved health and behavioral outcomes.

**Exploring Untoward Effects of SNS**

Although most anecdotal reports tend to document positive social health experiences for patients, concerns have been raised about the potential of SNS to undermine the patient–provider relationship, propagate misinformation and health fallacies, and compromise healthcare delivery in other ways. The empirical literature with respect to these concerns is limited in its breath and the conclusions that can be drawn from them. The ability of social-ranking sites to influence the choice of a healthcare provider by allowing patients to review and rate medical professionals has been a prominent area of study. Yet, when Lagu et al identified 33 physician-rating Web sites in the Boston area and searched them for a random sample of physicians practicing in the area, they found that >70% did not have a single review on any of the sites. Among the 81 physicians for whom there were a total of 190 reviews, 88% of them were positive. In another study, an analysis of 4999 physician ratings across 10 Web sites found that 62% of the patient reviews were favorable.

The spread of inaccurate and misinformation is often a concern when it comes to the social health experience. For instance, Scanfield and colleagues examined information sharing on Twitter to determine what types of misinformation about antibiotic use may be occurring in conversations on this site. From 52,153 status updates (tweets) that mentioned antibiotics, 1000 were randomly selected and analyzed in greater depth. The largest percentage was classified as commenting generally on taking antibiotics (29%), offering or seeking advice/information (16%), reporting side effects or negative reactions (11%), the reason for taking it (10%), and resistance (9%). However, the authors used data-mining techniques to determine that 687 of the 52,153 tweets reflected misunderstanding and misuse such as the use of antibiotics for cold or flu symptoms. Through a relatively small number (1.3%), the nature of SNS means that such misinformation can be spread to tens of thousands of people. McNeil and colleagues found that 41% of Twitter content (tweets) about
seizures were derogatory and, they suggested, were contributing to the spread of negative attitudes and stigma about epilepsy. In contrast, Bosley et al.\(^45\) reported generally positive findings among tweets that discussed a wide variety of topics related to cardiac arrest and resuscitation, noting that seeking and sharing of such information can be useful for surveillance and measurement of the reach of public health information campaigns.

**Privacy and Confidentiality in Digital Social Networks**

The use of digital social networks for sharing and discussing personal health information raises concerns over privacy and confidentiality of information. Hawn\(^2\) notes that the nature of social networks can lead to the diffusion of personal information beyond its originally intended targets (eg, close family, friends, and healthcare providers) and the lack of subsequent control of it (exposure of personal health information). Abril and Cava\(^46\) state: “…health networking privacy breaches can have several perpetrators: a malevolent blabbermouth, a mercenary web operator, a medical identity thief, or even an impulsive cyber-patient with a false sense of security.”

These authors go on to analyze potential digital SNS privacy breaches using 4 categories originally posed by Solove.\(^47\) The first set of concerns involves the limits of information collection, especially when it involves tracking and collation of a person’s search patterns, personal preferences, and other online activities apart from what occurs on the specific SNS. The use of information—how it is then aggregated, identified, stored, manipulated, used for purposes other than those originally intended by the person, and whether such information can be accessed and reviewed for accuracy by the individual (such as with credit ratings)—is a second group of concerns. The third area of privacy concerns relate to information dissemination: specifically, the unwarranted disclosure of health information and, more germane to healthcare providers, breaches of confidentiality. The fourth category proposed by Solove is invasion, including those by unwanted intruders or hackers and by corporations, employers, insurance companies, and other unwanted groups, as well. Abril and Cava add a fifth set of privacy issues that revolve around the overdisclosing user, especially minors who may not appreciate the risks that sharing personal health information may have in terms of immediate and future negative consequences.

Abril and Cava make several proposals to begin to address these privacy concerns. Chief among them is the use of online confidentiality agreements between users and an SNS, and they note that some SNS, such as PatientsLikeMe.com, include confidentiality clauses as part of their terms of use. They also call for state-of-the-art privacy protection technology safeguards to protect user information from unwarranted uses; a right to communicate anonymously; user education via informed consent procedures; individual control over who to grant or deny access to their personal information on a context-by-context basis (eg, only specific individuals in their network, opting-in for behavioral targeting by corporations, deidentifying their information for scientific purposes); and rights to access, correct, delete and transfer their profiles to another SNS.

Although social technologies are sometimes blamed for renewed concerns over privacy and confidentiality of personal health information, Solove\(^47\) makes the point that these problems are not created by technology alone, but principally through the actions of people, businesses, and government that then must be regulated. A recent example illustrates both the concern over privacy, and its contextualization by users, as well.\(^46\) A systematic review of the Facebook profiles of nearly 50% of 2053 medical students and residents at 1 university found 12 (or 1.2%) potential violations of patient privacy. All of these potential violations were posting of pictures from overseas medical mission trips. No words or text that identified patients or disclosed their health information were found. The authors note that all cases involved medical mission trips and call for guidelines to ensure that the privacy of personal health information is respected in all contexts of medical practice.

The deficit in the science base for SNS approaches to prevention and care requires more focused funding and effort. Although the mobile health arena has experienced a surge in research and funding, the social media technologies, despite their centrality and power in people’s lives, have been largely ignored up until now. The next sections offer our views on practice and research priorities for social media and health.

**Considerations for Practice**

Calls for more research will not slow down the consumer and commercial appetites for exploring social approaches to health promotion and disease management. So when deciding when, where, and how to use social media, there are several key factors to consider; these include:

1. **Put Social in Social Media.** The expectations people have of how to interact in this dynamic environment of SNS are much different from the previous ones of people who were audiences of broadcast, 1-way messages. The use of SNS means embracing the idea that the world is composed of social networks, not individuals.\(^2,49\) Social media are a world of distributed networks where anyone can be a producer and distributor of information. This new world focuses us on the engagement of people. The power of using social media is to take advantage of the connections people have with each other, not to reach people in new ways. The core strategic question is not “How do I reach and influence people?” but “How do we facilitate conversations among people, and encourage them to share their knowledge and information with others?” Valente\(^50\) proposes 4 general types of social network intervention strategies: those that identify and use champions or opinion leaders as agents of change; the use of segmentation to identify groups of people to change at the same time; stimulating peer-to-peer, or word-of-mouth, cascades of information and change (the so-called viral effect in social media); or deliberately altering the structure of the network itself; for example, by introducing lay health advisors into community settings or creating new linkages among agencies working toward common purposes.
2. Collaborate to Cocreate. Social media have the capability of moving health care and health promotion to not just more people-centered endeavors, but to more collaborative ones as well. Patient- or user-generated content is often valued but underused in health care and health promotion because of a lack of consensus on how to best implement and use it in a mutually beneficial manner. This means designing opportunities for providers, patients, and their families and friends to become collaborators, conveners, brokers, and network weavers in health care. By collaborators, we mean monitoring and contributing to the healthcare conversation, not being a passive consumer of the opinions of experts. Conveners use social media to bring people of common purpose together to get things done, whether that is online support groups for health behavior change or the distribution of information and coordination of health care. Becoming brokers means becoming a dynamic resource center where people can, among other things, exchange advice and information, rate the quality and relevance of health information products and services, provide ideas and comment on new services being planned by an organization, and allow agencies new ways and means to engage priority groups in health issues. And finally, agencies and organizations need to think about themselves as digital network weavers—pulling together diverse groups working on the same problem who do not have the connectors, or bridges, to otherwise bring them into contact with one another.

3. Create Shared Experiences. There are 5Es to keep in mind in working with SNS: education, engagement, entertainment, empowerment, and evangelism. Many of these can be achieved through a sixth E: creating a shared experience. When designing SNS interventions that will effectively lead to behavior change, we need to ask are we harnessing the ability to educate people about issues and problems that are relevant to them (not us), is what we do engaging them in positive and meaningful ways, is there an entertainment value to our offerings, do people believe and feel empowered as a result of their experiences with our programs (products and services), and do we take advantage of every opportunity to let our customers and clients become our evangelists. With SNS, embedding these 5Es in messages is not the goal; rather, SNS efforts must focus on designing environments in which people can cocreate their experience of health promotion and health care with others.

4. Think Beyond Big Numbers and Big Networks. Bringing to SNS research and interventions the idea that people in SNS or online communities are target audiences fails to acknowledge that, in the social media world, it is not about audiences, but communities. This bias arises when organizations begin thinking about creating their own communities before understanding whether there might exist online communities that they could join. Or they resort to using the most popular sites, or the ones with the largest number of members, in their quest for success in the social media world. In most cases, this presumption is based on the numbers of visitors that go to these sites rather than on any understanding of whether the people they wish to interact with are there or if those sites are the best place to try and engage them in health and medical topics or behavior change activities. Achieving reach with social media communications may not be the most important metric of success. Attract and join seems to be the more successful strategy.

5. Honor the Trust Barometer. Whether people can or should trust health and medical information they find on social media sites is a key concern of health providers and policymakers. Results of the PricewaterhouseCoopers study found that adults would trust information posted on social media sites by doctors (60%), nurses (56%), a hospital (55%), and a patient advocacy organization (54%). “Other patients you know” were trusted by 46% of respondents, whereas government agencies (45%), health insurance companies (42%), and drug companies (36%) were less often endorsed as trusted sources on social media sites. In the social media environment, trust is one of the most important attributes for success. It is also one of the more easily lost ones if consumers and patients perceive a lack of transparency, experience difficulties with using the media, or receive conflicting information from 2 or more sources.

6. Follow Professional Standards. Many US healthcare providers have been hesitant to engage with patients through social media channels because they worry that the health-related information they provide could be taken out of context and interpreted as medical advice. Yet, providers can also inadvertently cross professional standards with their use of social media sites. In response to these concerns, the American Medical Association drafted a “Professionalism in the Use of Social Media” policy encouraging the appropriate use of social media channels and tools. Similar steps for issuing guidance in this arena have been taken by the Federation of State Medical Boards and the US Department of Health and Human Services among other groups.

Future Directions for Research
The research demonstrates that the phenomenon of people using the Internet and especially SNS for health information seeking and for health interventions is no passing fancy. Yet, there have been few controlled studies from which to draw valid conclusions for the efficacy of SNS to impact health-related knowledge, behaviors, and status. The literature has also not produced examples of trial designs that would allow for systematic investigation of the relative benefits of various SNS features and their impacts on social network typology and dynamics. And important questions remain unaddressed by research that could improve the quality and efficacy of the many social media sites that currently exist.

Bennet and Glasgow posed several questions for future research efforts in this field to consider:

- Is social networking more useful for some outcomes (eg, weight loss, physical activity promotion, smoking
cessation) than for others (eg, pediatric enuresis, human immunodeficiency virus/sexually transmitted disease prevention)?

- What are the relative benefits of professionally moderated versus unmoderated social network sites?
- Does intervention efficacy vary as a function of whether an individual chooses to affiliate with (versus being assigned to) a given social network site?
- Are specific social-networking designs (eg, information aggregation, forums, blog-style comment systems, syndicated content strategies) associated with differential Web site utilization?

A workshop that explored a research agenda for online social networks and smoking cessation developed an extensive list of questions that included understanding fundamental mechanisms of online networks, how information and behavior diffusion occur through online social networks, designing intervention systems that leverage online social networks and mobile technologies, and evaluating smoking cessation trials that link social network structure and dynamics to outcomes.55

We propose additional questions for further study:

- What types of people (and with what types of health and medical conditions) are more likely to voluntarily seek out online digital support networks, engage with them, and persist in using them to change health-related behaviors and manage health and medical conditions?
- To what extent are general social networks used by people for instrumental and emotional support in making behavior changes and managing health conditions? What characterizes these people? What outcomes do they expect and experience?
- What types of characteristics are people looking for in health SNS, such as being able to socialize with others, to access information, and to have mobile access and privacy?56
- What types of network data, for what types of target behaviors, and under what circumstances are needed to create feasible and effective social network interventions? What kinds of social network analyses are necessary to evaluate their effectiveness?55
- Is behavior change more likely to occur in an SNS with people they know, have previous connections with, or share other interests with?57,58
- Does participation in SNS of any kind lead to, or sustain, better health status—whether this is greater resistance to infections, better prognosis among people with life-threatening illnesses, less cognitive decline, or more resilience to daily life and work stress?28
- Do SNS facilitate the adoption and maintenance of risky behaviors, and under what circumstances are needed to create feasible and effective social network interventions?
- What characterizes these people? What outcomes do they expect and experience?
- What if any do they expect and experience?
- What are the relative benefits of professionally moderated versus unmoderated social network sites?
- Does intervention efficacy vary as a function of whether an individual chooses to affiliate with (versus being assigned to) a given social network site?
- Are specific social-networking designs (eg, information aggregation, forums, blog-style comment systems, syndicated content strategies) associated with differential Web site utilization?

Disclosures

None.

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R. Craig Lefebvre and Alexandra S. Bornkessel

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