Social Media Use by Physicians:
A Qualitative Study of the New Frontier of Medicine

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ABSTRACT

Background: A growing number of physicians are using social media to communicate about health. Social media has the potential to expand communication between healthcare professionals, patients and the public.

Objective: To explore the role of healthcare providers in social media through interviews with physicians. The research aims of this study included understanding physicians' personal experiences with social media, their perceptions of others' experiences and their expectations for the future of social media use in healthcare.

Design: This was an exploratory qualitative study involving in-depth semi-structured telephone interviews of physicians who were early adopters of social media. Early adopters were defined as physicians who were currently or had previously used social media to distribute health information. Participants were recruited through snowball sampling. Interviews were transcribed verbatim via hand-type notes. The transcripts were then manually analyzed for common themes by three separate investigators, who came to common conclusions via the constant comparative method.

Results: Seventeen physicians participated in this study, including 35% females, 76% pediatricians and 76% bloggers. Participants identified multiple perceived benefits and barriers to social media use by physicians and several perceived benefits and barriers to social media use by patients to access health information. In addition to the benefits and barriers, four major themes were identified. First, participants who engaged in social media often saw themselves as rugged individualists who preferred to set their own rules for communicating through social media. Second, participants expressed significant uncertainty concerning when, how and to what extent physicians should use social media as well as the impact of their use of social media on

their followers. Third, participants largely used social media like traditional media, i.e. a one-way communication platform, rather than as a "social" interactive forum. Finally, participants expressed disparate views regarding the time involved in participating in social media; some felt that time spent on social media was unproblematic to fit into their day while others felt that it was an impediment.

Conclusions:

As the first generation of physicians using social media, it may not be surprising that these participants value their independence, ability to make autonomous decisions and importance in the field. However, uncertainty remains regarding their roles and responsibilities as medical providers within this new venue. Furthermore, few providers appeared to be using the platform to its full potential. As the next generation of physician-bloggers emerges, it will be important for the medical community to collaborate with these innovators in developing guidelines that acknowledge the significance of providing published medical counsel online while still allowing for personal creativity within this unique venue.

INTRODUCTION

The internet now provides access to health information ranging from factsheets on how to sooth a colicky baby to videos on how to perform a heart transplant. [1, 2]. As of 2014, 87% of U.S. adults reported using the internet and 72% of internet users reported looking for health information online [3,4]. Furthermore, a significant number of people accessing health information online reported that the information they found would "likely" or "very likely" influence their future health care decisions [5]. Both patients and healthcare professionals are increasingly turning to these online resources, including websites, social media and personal research tools, for health information [6].

THE NEW ERA OF SOCIAL MEDIA

The use of social media sites has grown exponentially over the last few years, with participation in social media increasing from 8% of internet users in 2005 to 74% in 2014 [7,8]. The Oxford Dictionary defines social media as "websites and applications that enable users to create and share content or to participate in social networking" [9]. Social media provides users the opportunity to generate, share, comment on and receive multisensory content distributed amongst multiple users [10]. Social media platforms include collaborative projects (eg. Wikipedia), content communities (eg. YouTube), social networking sites (eg. Facebook) and social worlds (eg. Second Life) [10].

Interestingly, neither race nor gender shows a statistically significant difference in terms of the digital divide [11]. In one national survey of U.S. adults, they found that African American internet-users were actually more likely to use social networking sites than non-Hispanic Caucasians [12]. Minority adults were also more likely to use cell phones to access the internet, send text messages and participate in social networking [13]. Seventy percent of households earning less than $10,000 per year are also now using the internet [11]. In those same

households, there are no major differences in social network site usage compared to more economically advantaged households [11]. In fact, several studies show that social media users are disproportionately from lower-income households [12,14,15].

SOCIAL MEDIA AND HEALTH

As social media membership has increased, so has peoples' interest in using social media to find or exchange health information. A 2012 survey found 26% of health care consumers are using a social networking site for health related purposes, including 11% who actively participated by posting comments, queries or information about health or medical issues [16,17]. Through a systematic review, Moorhead et al identified seven key uses of social media for health communication: 1) provide health information on a range of conditions, 2) provide answers to medical questions, 3) facilitate dialogue patient to patient and patient to health professional, 4) collect data on patient experiences and opinions, 5) health intervention, health promotion and health education, 6) reduce stigma and 7) provide online consultations [10]. Social media is unique in that it allows for two-way communication online, which makes it an ideal platform for both mass health communication and one-on-one conversation [12].

PATIENTS AND SOCIAL MEDIA

Patients have been active on social media, locating health information, participating in discussion groups and relating their struggles with health and illness [18]. The majority of patients use social media to obtain and share health information for themselves, family members and friends [19-24]. Discussion forums, chat rooms, instant messaging and online consultations with clinicians allow patients to share their experiences with their health and the health care system [25-27]. Social media platforms such as PatientsLikeMe, Blog sites, Facebook and MySpace also facilitate dialogue patient to patient and patient to health professional [7,28,29].

Even as online resources are expanding, healthcare consumers continue to trust information from their doctor or hospital far more than internet or social media sources [16]. Seventy percent of individuals still turn to their doctor first when searching for answers to their health questions [30]. The majority of these interactions remain in the office rather than online [30].

PHYSICIANS AND SOCIAL MEDIA

Physicians have also been active on social media. In a 2010 comprehensive study of 921 health-related blogs, Miller and Pole found that half of the bloggers worked in health professions [31]. Of these, 43% were physicians [31]. Another national survey of physicians and physicians in training found that 94% of medical students, 79% of resident physicians and 42% of practicing physicians reported using online social networks, a comparable amount to the general population [7]. As physicians have increased their presence online, they have begun exploring ways to use social media both personally and professionally [32-38]. According to a study of 80 medical blogs and bloggers, major motivations for blogging were sharing practical knowledge or skills with others, influencing the ways other people think and expressing oneself creatively [39]. Minor motivations included making money and staying in touch with friends and family [39]. Several physician bloggers (blog authors) have ventured into professional blogging and a few have even made a career out of writing blogs [40].

Physician-bloggers have used social media to find and share health information, network with colleagues, communicate with trainees, disseminate research, market their practice and engage in health advocacy [18]. However, few healthcare providers have engaged with their patients online [10]. Physicians are hesitant around the issue of the ethical acceptability of interacting with patients in this new venue [7]. The boundaries regarding professional interactions online are unclear [18]. While some national medical organizations have published

social media guidelines, they often lack specific behavioral guidance or definitions of professionalism as applied to the online space [41-44]. This situation may be reminiscent of early physician email use, where it took time for physicians to learn the skills and recognize the impact of this new resource [45].

One reason for the lack of guidelines may be because little empirical research exists on physicians who use social media [32,39,46-49]. Several commentary articles have discussed how blogs may be used in health education and research, such as through mobile health monitoring tools, peer-to-peer online interventions, caregiver support networks and online communities of health professionals [51-55]. However, these tools lack evidence demonstrating efficacy. Other commentaries have discussed how health care professionals can use blogs to improve lifelong self-education, exchange health information and provide patient education and support [32,49,50,56-60]. However, few scientific studies have been performed to verify these observations. In one study, which analyzed the content of 271 weblogs written by health professionals, they found that weblogs offer the opportunity to share narratives, but also risked revealing confidential information or reflecting poorly on the author or profession [32]. Another study involving semi-structured interviews with clinicians and managers in Quebec found that Web 2.0 may be a useful mechanism for knowledge transfer of stroke best practices [49].

While these studies provide valuable insights into this relatively new field of social media use by physicians, more information is needed to understand the potential of social media for health communication [61]. More research may help improve utilization of social media by physicians for enhancing medical education, advancing scientific research and supporting patient care [61]. The objective of this study was to identify physician-bloggers' attitudes regarding the uses, benefits and limitations of social media when employed by physicians.

METHODS AND MATERIALS

Study design

This was an exploratory qualitative research study designed to gain an understanding of physician views on using social media for communication about health. For the purpose of this study, social media was defined as any website that enables users to create and share content or to participate in social networking. Qualitative methods were used for this study because they provide data on the needs, beliefs, attitudes and values of various populations [62]. Interviews were selected as the primary method of data collection because this approach encourages open information exchange, targeted follow-up questions and continual assessment of attitudes.

Setting

Data for this study were collected between January and March 2014. One-on-one telephone interviews between a physician and a researcher were recorded verbatim by the researcher via hand-typed notes. This project was conducted under the approval of the University of Washington Human Subjects Review Committee and with the verbal consent of each healthcare provider who participated.

Participants

The participants in this study were physicians who were currently or previously using social media to distribute health information. As social media use for health promotion by physicians is still a relatively new practice, the participants were considered to be early adopters in this field. To be included in the study, participants were required to be physicians who were

currently or had previously used social media to provide health information for over one year. Exclusion criteria included anyone who did not use social media, was not an English speaker or was not a physician.

Data Collection

Interview questions were developed by study staff and reviewed by several experts in qualitative research. Questions were further revised on the basis of feedback from participants. Given that the phenomenon of social media use by healthcare providers is relatively new, open-ended questions were used to obtain insights from participants. Our objectives included understanding physicians' personal experiences with social media, their perceptions of others' experiences and their expectations for the future of social media use in healthcare. The questions fell broadly into five categories: Demographics, Perceived benefits of social media use, Perceived barriers to social media use, Perceived reach through social media and Perceived effect of social media. Examples of questions from each category included:

Demographics: What gender and race do you consider yourself to be?

Perceived benefits: Should more providers be using social media in their practices? Why or why not?

Perceived barriers: What problems have you had thus far in implementing social media in your practice?

Perceived reach: Are there gender, age, racial or socioeconomic trends in the patients who are using social media for health information?

Perceived effect: Do you think that social media is an effective medium for promoting health behavior change?

Recruitment

Recruitment took place through snowball sampling, a recruitment technique involving identifying an initial purposeful sample, then asking those participants for further suggestions for potential participants who meet inclusion criteria [63-65]. This technique is especially effective in studies of early adopters, since there usually are few individuals involved and they are usually the best resource for determining who else is involved in the field. While recruitment began with pediatricians, we asked that participants recommend physicians from a variety of specialties in a variety of practices for future interviews, including prominent physician bloggers. Providers were sent a standardized email, blog or Facebook message informing them of the purpose and purview of the study and consent information. Upon receiving a positive reply, an appointment was set for a telephone interview.

Procedure

Prior to the interview, the researcher and participant reviewed the consent form and the participant was asked whether or not they consented to participate in the study. If the participant gave their verbal consent to participate, the researcher began an in-depth semi-structured telephone interview. The interview process was inductive, such that questions were adapted to represent areas of interest of the participants. Interviews were transcribed verbatim by the interviewer via hand-typed notes. Participants did not receive compensation for their participation. Interviews generally lasted twenty to forty minutes. Three researchers reviewed

transcripts at intervals to determine when thematic saturation was reached. These researchers then individually analyzed the transcripts and agreed on common themes that emerged from the data.

Analysis

The hand-typed transcripts were analyzed manually. Transcripts were initially read individually by three investigators, who each coded the main beliefs, attitudes and values of the participants. A discussion was then held between investigators to discuss themes and representative quotations. Transcripts were then re-assessed and the investigators discussed until consensus was reached on the common themes and concepts expressed by participants using the constant comparative method [62]. Thematic analysis was conducted and quotations were taken with common consensus of the investigators.

RESULTS

Participants

Seventeen physicians participated in this study. Of the seventeen participants, the majority were male (65%) and Caucasian (82%) (Table 1). Only one of the participants had practiced medicine for less than five years, with the majority (41%) having been in practice for eleven to twenty years (Table 1). In terms of specialty, most of the participants were pediatricians (76%) (Table 1). Almost all of the participants engaged with multiple social media platforms, including Blogs (13), Twitter (10), Facebook (7), Pinterest (3), YouTube (2) and Tumbler (2) (Figure 1). Five of the participants also engaged in traditional media such as radio,

newspaper columns and magazines (Figure 1). Although the majority of participants spent three to six hours per week working on social media platforms, a few spent less than two or greater than ten hours per week on social media (Figure 2). Around one third of participants were compensated for at least some of their work on social media (Table 1).

Benefits and barriers

Through this study we sought to explore the views of physicians on social media regarding how physicians' social media use impacts medical practice as well as why and how physicians on social media use these new technology tools. Findings included a striking number of perceived benefits and barriers to social media use by physicians. Most physicians felt strongly that the benefits of their participation in social media far outweighed any barriers they faced. The perceived benefits of their social media use included forwarding their career or research endeavors, self-improvement through listening to others' tweets and keeping up with the literature, increasing their reach, i.e. their audience, and providing a space for them to openly express their opinions. However, participants also identified several categories of barriers hindering their participation in social media. Examples of these included the time/work requirements, skill requirements, lack of institutional support, fear of saying the wrong thing online and lack of models/guidelines in how to conduct themselves online in their role as physicians.

Physician participants also discussed several benefits and barriers for patients using social media for health information. They perceived that patient benefits may include having increased access to an accurate, trusted and understandable source of health information, the low cost for access, that social media is accessible in general and that it provides a way for patients to

engage with providers outside the office. Participants also perceived several barriers to patient engagement in social media, including language barriers, "mental disability," poor literacy/education, lack of internet access and worries about the lack of privacy online. In addition, participants identified several mutual benefits for patients and providers. These included increasing communication options and the speed of communication as well as breaking down traditional professional barriers. Finally, social media know-how was described by participants as a mutual barrier to uptake for both physicians and patients. See Table 2 below for a full list of benefits and barriers to social media use by physicians as perceived by participants.

Themes

In addition to the benefits and barriers, four major themes were identified: (a) Rugged individualism, (b) Uncertainty, (c) Social media as media and (d) Time constraints. These themes were present across interviews and emerged in response to varied questions and discussions.

Theme 1: Rugged Individualism.

Interviews revealed that physicians participating in social media perceived themselves as pioneers in the field who would like to make their mark on a new frontier of medicine. As such, participants often felt alone or independent in this effort. In the words of one participant, "I think most of us who are doing it (social media) feel a little bit like lone rangers." Physicians expressed several motivations for their participation. For most, the appeal of social media was described as its ability to serve as an independent platform where they could express their own opinions freely, without interference or oversight. Most participants stated that their participation in social media hinged on the premise that they "have all editorial control," i.e. the final say on

what is published. Only six of the seventeen physicians interviewed reported any peer oversight of their publications, where the oversight came from a co-blogger or their own practice. One participant described their experience of shared oversight as follows:

> "For the most part, on our Facebook page, the clinic decides. I do videos for [website]. They wanted to title it '[title],' so it's about helping parents decide what's normal or not. They can choose a question, but the answers are always mine."

None of the seventeen participants mentioned a peer review process.

While participants were conscious of their role as physicians online and the weight of the information that they promulgated, the majority still described their social media page as a personal platform. One example quote was:

> "There's things I can do personally that I couldn't as part of my practice or the hospital. I can say what I think is important or not and laugh and joke. It's just a nice outlet. I've definitely gotten connected with people because of my activities on the canvas. I like the idea that as an individual you can be a thought leader without working with these huge multilevel institutions. The ability to do this as an individual, as a physician, is very cool."

For example, even though the study was preferentially targeted towards physicians using social media as a tool to reach patients/communities, participants more often touted its utility for personal branding, marketing and networking than for interacting with patients. One participant described, "if you write your own stuff and other people see it, it's a good way to self-promote." Furthermore, several participants highlighted that this drive towards personal promotion resulted in having been granted new research or career opportunities as a result of their engagement with social media, even if this was not their original motivation for joining these platforms.

Finally, most participants described using social media as fun and enjoyable. One participant stated: "It's actually an incredibly empowering medium as a form of self-expression. If you understand how to use it and communicate with it, then it's really exciting." The majority of participants had been involved in traditional media or communications prior to engaging with social media and enjoyed interacting in this new sphere personally as well as professionally. Whether this is a trait of all early adopters or simply of these professionals, the stalwart individualism of these physicians was a theme that pervaded the interviews.

Theme 2: Uncertainty

Participants expressed many levels of uncertainty about their preparedness, their impact, the potential for repercussions and the future of physicians' presence on social media. Participants described feeling unprepared when they started using social media. Many participants described concerns such as lacking knowledge about how to use certain social media platforms, the rules/etiquette for use and how to integrate social media with traditional media. Several participants felt that they were "digital immigrants," including one physician who had "literally never heard of a blog before" starting to write one. While all participants articulated that they felt capable of learning through experience, uncertainty remained around practical aspects of social media use; for example, when and how often they should be posting content and responding to comments. In addition, participants struggled to define the line between personal and professional use; while most participants chose to share personal stories of health and family, some wrote solely about medical issues and updates. For example, one participant expressed how they "wanted to story-tell and share information organically, to talk about my experience of raising my children at the same time as giving information on pediatrics and

prevention." While another participant explained how she is "very much being a doctor on social media. I'm not doing it much for personal things."

Secondly, participants were uncertain about whom they were reaching and the impact they may be having. Although most physicians were able to track how many hits they had on their site and where the hits were from geographically, where a "hit" is a click on a page, they could only guess at the demographics of their followers and responders. As one participant responded, "I don't really know. I assume that I'm reaching a representative sample from our patient population at [our healthsystem], but I don't know." It is interesting to note that most participants stated that they guessed they were reaching white middle-to-upper class English speakers with a high reading level. In response to a question about who they were reaching through social media, one participant responded that she perceived that her readers were:

> "mostly college educated, higher literacy level because I wasn't writing it as the third grade reading level. I was writing it in the way I would in college. And the questions I'd get back were written in a similar tone."

In addition, participants lacked any information on the behavioral impact of their social media updates. At most, physicians noted anecdotally that patients would mention topics that they had posted about online; however, they had no data on behavior change, as described by one participant:

> "Right now, our data metrics are flawed. We have [information on] how many hits. We have how many people are following you, etcetera. But we don't have what happened after they access the information. The only thing we can do is if they actually answer us, 'These three things I'm gonna change after this lecture.' People say I'm gonna change this and change that but we don't really know."

One participant pointed out that she perceived a change in the vaccination rate of her clinic population of patients since starting her blog. However, she also speculated that this was more likely to be confounding from new patients coming to her clinic or old patients leaving her clinic based on whether or not they agreed with her views on vaccination posted online than on patients changing their minds.

Thirdly, significant uncertainty was expressed regarding potential repercussions as a result of social media use. In addition to lacking data on who was reading their posts, participants stated that they lacked data on who might be monitoring their posts. Some physicians expressed concern about backlash from the media or an employer based on something another physician had posted, though few felt like they themselves were at risk of making such an egregious error. One participant went as far as to insist that this concern was irrational:

> "The number one problem is the irrational fear of litigation. I have many different physicians writing for me on different topics. I wanted to get some obstetricians to write about prenatal care and they all said, 'no.' Malpractice doesn't include verbiage about this but they should so people can feel free to write… There's no precedent for docs being sued for general medical writing."

Finally, participants expressed uncertainty around the issue of whether or not it is the duty/ obligation of physicians to provide health information on this new accessible medium. While some participants were insistent that more physicians should be involved, most were equivocal, stating that physicians should only participate if they would enjoy it and are equipped to do so. Physicians in private practice were more likely to view social media as an increasingly important aspect of their practice, as one participant described:

> "I think everyone should be using social media in their practices. This is how communication is happening right now. As a pediatric provider, you're not just communicating in the exam room, but ideally you're being involved in your community, making your community a better place for children. It really becomes global with the internet."

However, hospitalists and physicians who reported primarily working with Medicaid patients were less enamored with its prospects of reaching their patient populations, or the idea that every physician should be involved in social media. As one hospitalist expressed, "not every platform is for every person. If you're interested, there's a lot of benefit, but if you're not interested, there's already a lot of people out there." Overall, there remain much uncertainty and disagreement amongst early adopters.

Theme 3: Social media as media

A third theme was that physicians tended to describe their use of social media similar to what would be expected in traditional media rather than as an interactive "social" platform. Unlike traditional media in which messages are distributed in a one directional manner, social media allows participants to listen as well as communicate back. However, most physicians in this study described treating this platform as a personal space where they could advertise their ideas or brand their niche in medicine instead of as a bidirectional patient-provider network. As one participant phrased it, "I think it's a megaphone, like any media. It amplifies. Your voice gets to more people." A few notable physicians did prescribe to be engaging social media in this interactive way where they would both post content and listen to questions and concerns, but this was the exception, not the rule.

In addition to serving as a place to listen to common concerns, social media can also serve as a forum for one-on-one conversation. While providers recognized the value of using social media as a place to interact with their fellow physicians and researchers, few discussed its potential for conversing one-on-one with patients. In terms of patient care, most described it like a loudspeaker where they could project opinions and post evidence based medicine rather an as a conversational tool, such as this participant's comment:

> "I'm an educator and I use social media to educate and to opine. I like just ranting and raving and telling people what I think about something and causing a raucous. It is the twenty first century Hyde park… you can stand on your soap box and yell and they'll yell back."

Another related and important aspect of social media discussed by physicians was the amplification effect.

According to participants, the amplification effect is "the ability to broadcast or narrow-cast content. Using different tools, you can amplify a message to a certain population or the population at large." Several physicians discussed how this amplifying effect was exactly the reason why more physicians need to add their voice to social media, especially in terms of countering vaccine misinformation. Participants viewed it as a powerful tool for reaching patients with important medical information, especially messages concerning public health. Thus, while physicians were not partaking in all aspects of "social" media, they did appear to be utilizing some features.

Theme 4: Time Constraints

Time was an thematic element which seemed to diffuse through every part of every interview. Participants fiercely debated whether or not time spent working on social media was a serious impediment or easy to fit into their day. For some physicians, the time spent listening to others' twitter streams and blogs, prepping and composing their posts and responding to comments required that they decrease their patient load or add additional work-time to their already busy week. One participant noted that,

> "right now, most of the doctors I know with very successful blogs have quit practicing medicine. They're now bloggers and not doctors. I see that occurring pretty regularly… I have 12 hour days in the office. It's very difficult for me to go home and do a lot of blogging."

Conversely, other participants felt that their time spent on social media could easily fit into downtime at meetings or 15 minutes before bed and expressed the sentiment that physicians who felt otherwise were mistaken. One participant described:

> "I would say, the nice thing about social media is that you can do it in between things. I dedicate thirty minutes a day on average. I bundle all of it so I can reach multiple platforms at once. It's not a lot of time. That is one of the biggest misconceptions."

Participants also debated whether using social media for health promotion improved or decreased efficiency in the office. While some physicians postulated that their posts on social media may increase clinic efficiency by decreasing unnecessary patient calls and visits, others believed that it decreased efficiency by distracting providers from direct patient care.

Time also served as a barrier to establishing institutional support for participants' use of social media. Participants expressed how "institutional backing is lukewarm at best" and how, "apparently, according to our organization, we have other priorities." Several physicians

expressed their frustration with trying to jump through multiple hoops in order to partner with their parent institution or practice; many of these physicians concluded that the time and effort required establishing a partnership was too great of a barrier and that they would rather continue alone. One participant argued, "I've been reluctant and too lazy to deal with the formalities of it. Last thing I want to do is spearhead the activities for my colleagues behind the times." Time was also discussed in terms of the 21st century conception of time, where conversations, questions and updates happen immediately, not only in a 15 minute office visit. Participants felt that this was one of the most pressing reasons for physicians to expand into the realm of social media, as described in this quote:

> "We have the 15 minutes problem. The amount of time I have to speak with people. I cannot cover everything. Some of my patients I may only see once or twice a year. And in the meantime, I'm learning about things that could benefit them. If they're following me, they can learn about the things I'm learning about… I think that it expands the visit and the relationship in ways that are really great and really easy."

However, it also represented a barrier to use, since physicians rarely had the flexibility to respond instantaneously or engage in present-time twitter conversations, as described in this quote:

> "Most docs are just so pressed for time as it is, trying to already balance work and life. Finding the time to do something you need to update quite frequently. When there were blogs, to post, you could put out content on your own time. Now that it's constant with Facebook and Twitter, you really need to update on a more timely bases. It's almost a living thing that keeps going even while you're in clinic or at home."

Overall, time held a conflicted position in the eyes of participants.

DISCUSSION

In this study of social media use by physicians, we identified multiple perceived benefits and barriers for both physicians who create content and readers who consume this content, as well as several themes. First, participants who engaged in social media often saw themselves as rugged individualists who preferred to set their own rules for social media use. Second, participants expressed significant uncertainty concerning when, how and to what extent they should use social media, and the impact of their use of social media on their followers. Third, participants largely used social media like traditional media, i.e. a one-way communication platform, rather than as a "social" forum. Finally, participants expressed disparate views regarding the concept of time; some felt that time spent on social media was insignificant and easy to fit into their day while others felt that it was an impediment.

Our first theme was that physicians using social media viewed themselves as "rugged individualists." This viewpoint is consistent with characteristics of early adopters described in previous literature [66]. Previous studies have found that physicians may be early adopters of other ideas and products, such as pharmaceuticals [67]. As the first generation of physicians using social media, it may not be surprising that these participants value their independence, ability to make autonomous decisions and importance in the field. However, as the next wave of physicians begins to engage in social media, it will be important to temper this independence and enthusiasm with the responsibilities of providing published medical counsel on the internet. This may include instituting peer oversight of published content, demonstrating credibility online in terms of professional licensure, institutional support (from American Academy of Pediatrics

(AAP), American Medical Association (AMA), American Academy of Family Physicians (AAFP), etc), or other certification of informational accuracy and providing more training/mentoring for physicians who choose to engage in social media.

Our second theme described how participants noted uncertainty in their responsibilities around providing a new type of information in a new venue. This was partly due to a lack of communication or agreement between the needs/desires of the physicians using social media, the needs/desires of the medical community and the needs/desires of patients. While several medical associations have produced guidelines for social media use among physicians, few have taken into account the goals of physicians who are engaged in social media themselves. Guidelines from the AMA and AAP are focused on professionalism [68,69]. The AAFP has developed a more comprehensive guide, with topics ranging from patient privacy to medical board concerns to setting social media policies within a practice [70]. While these guidelines may be helpful for physicians on social media, especially concerning liability, few address physicians' intentions for using social media and their perceived benefits and barriers to use. These uncertainties represent areas in which physician-social media users could collaborate to develop best practices, similar to the process employed when decisions were being made around email use by physicians [71].

Finally, our third theme illustrated that while our participants were identified and recruited due to being recognized as forerunners in the field, many of them still underutilized the full power of social media tools. Many of our participants described using social media as a "megaphone" or mouthpiece, suggesting they were using it to broadcast their own views. The idea of the loudspeaker may be an artifact of the fact that many of our participants had previous experience in media, marketing or communications. However, participant responses suggested that they felt unaware of who was listening or what their audience was saying. This key element

of social media: the capacity for interactive and two-way communication, appeared to be underutilized. Furthermore, several participants' comments suggested pessimism about reaching their low income, non-English speaking, low literacy and older patients using social media. Participants voiced that they generally felt that their audiences were most likely middle-upper class Caucasian readers. However, studies on social media have found that African American internet-users are more likely to use social networking sites then their non-Hispanic Caucasian counterparts and that seven of ten households earning less than ten thousand dollars a year are using the internet [11,12]. Thus, there seems to be a disconnect between who physicians are targeting on social media and who is using social media. As a profession, this is an opportunity to provide greater access to health information for all patients.

Limitations to this study include the small and purposeful study sample, the predominance of pediatricians in our sample and the lack of audiotape recording. We specifically recruited physician-bloggers who were nominated by their peers because of their success, influence and recognition. It was the views of these early adopters that we wanted to capture in this study. However, given that this is a nonrandom sample, our findings cannot be generalized to other populations or the full network of physicians on social media. Furthermore, since our study design was qualitative in nature, causal inference was not the goal. Rather, we wanted to explore major themes and areas of importance for the field in order to guide future research and recommendations.

Despite these limitations, our study is the first to evaluate physicians' perceptions, goals and challenges in using social media. According to our participants and general trends, social media is only going to continue to grow its presence within medical care. Therefore, it will be important to consider best practices, which may include a peer review process as well as

standards for best practices for physicians on social media. These best practices will benefit from input from physicians, medical organizations and patients. In addition, it will be important for current and future physician-social media users to continue improving their integration of the "social" tools of social media to better connect with their patient- and colleague-followers. Social media provides a unique opportunity to reach individuals from low income, non-English speaking, low literacy and minority backgrounds; future approaches should consider using social media to reach these hard-to-reach groups [11-15,72]. Qualitative studies like this one will continue to serve an important function in designing and refining the role of the physician in social media-healthcare as its presence escalates from the early adopter phase to the early majority. Examining the views of prominent physician-social media users demonstrated the need for more research into the goals of physicians, the medical community and patients in terms of discussing medical information on social media. It also demonstrated a lack of information on physician-blog readership demographics, targeting of specific patient populations online, behavioral impact of medical advice online and guidelines for professionalism online. It will be important to determine who is listening to healthcare providers on social media and how to provide appropriate guidance so that providers feel comfortable interacting with patients on social media. We hope that future studies will investigate these key topics so that the "wild west" of physician blogging will become an integrated metropolis.

Table 1: Demographics of study participants		
Category	**Subcategory**	**N(%)**
Gender	Male	11 (65)
	Female	6 (35)
Race	Caucasian	14 (82)
	Asian	2 (12)
	African American	1 (6)
Years in Practice	0-5	1 (6)
	6-10	5 (29)
	11-20	7 (41)
	20-44	4 (24)
Medical Specialty	Pediatrics	13 (76)
	Internal Medicine	2 (12)
	Family Medicine	1 (6)
	Surgery	1 (6)
Social Media Platforms used	Blog	13 (76)
	Twitter	10 (59)
	Facebook	7 (41)
	Pinterest	3 (18)
	YouTube	2 (12)
	Tumbler	2 (12)
	Linked in	2 (12)
	Other (Vibe, Sprout, Storify, Flagship, Instagram, Flicker, Foursquare, Linked In, Google plus)	5 (29)
	Media (radio, newspaper, magazine)	5 (29)
Hours per week Spent using Social Media	0-2	3 (18)
	3-6	10 (59)
	7-10	2 (12)
	>10	2 (12)
Compensation for blogging	Yes	5 (31)
	No	11 (69)

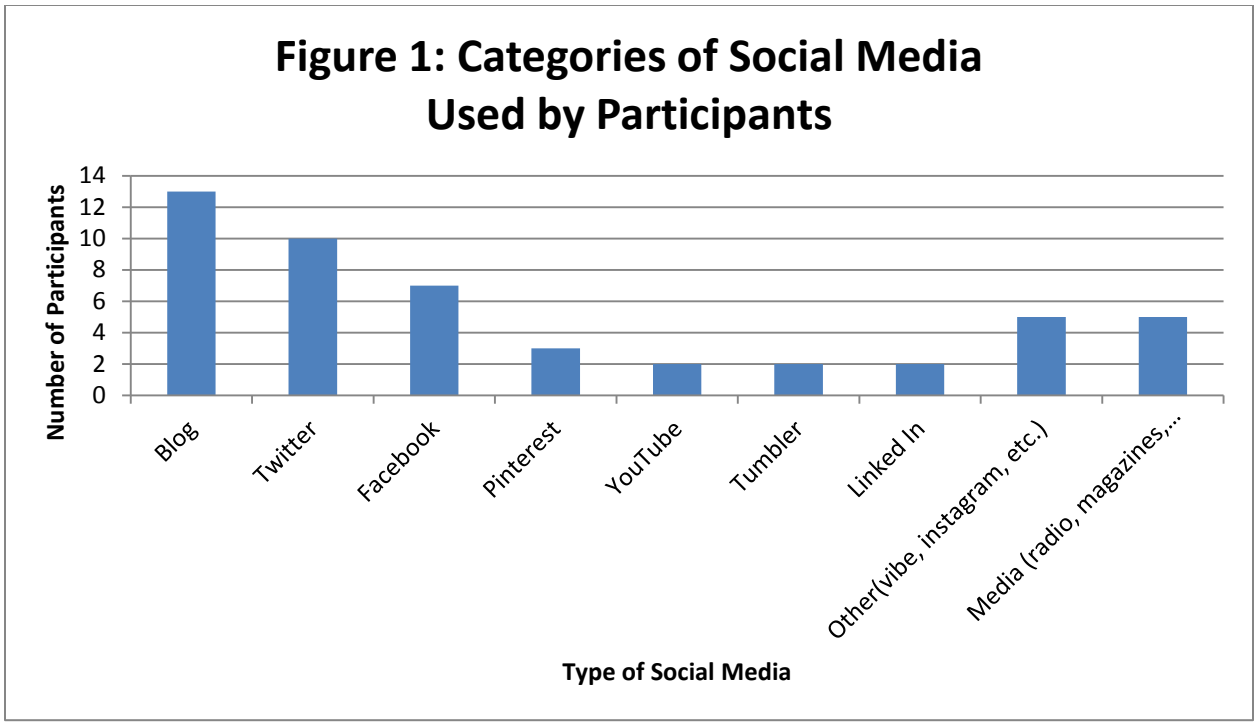
Figure 1: Categories of Social Media Used by Participants
Number of Participants
14
12
10
8
6
4
2
0
Blog
Twitter
Facebook
Pinterest
YouTube
Tumbler
Linked In
Other(vibe, instagram, etc.)
Media (radio, magazines,...
Type of Social Media

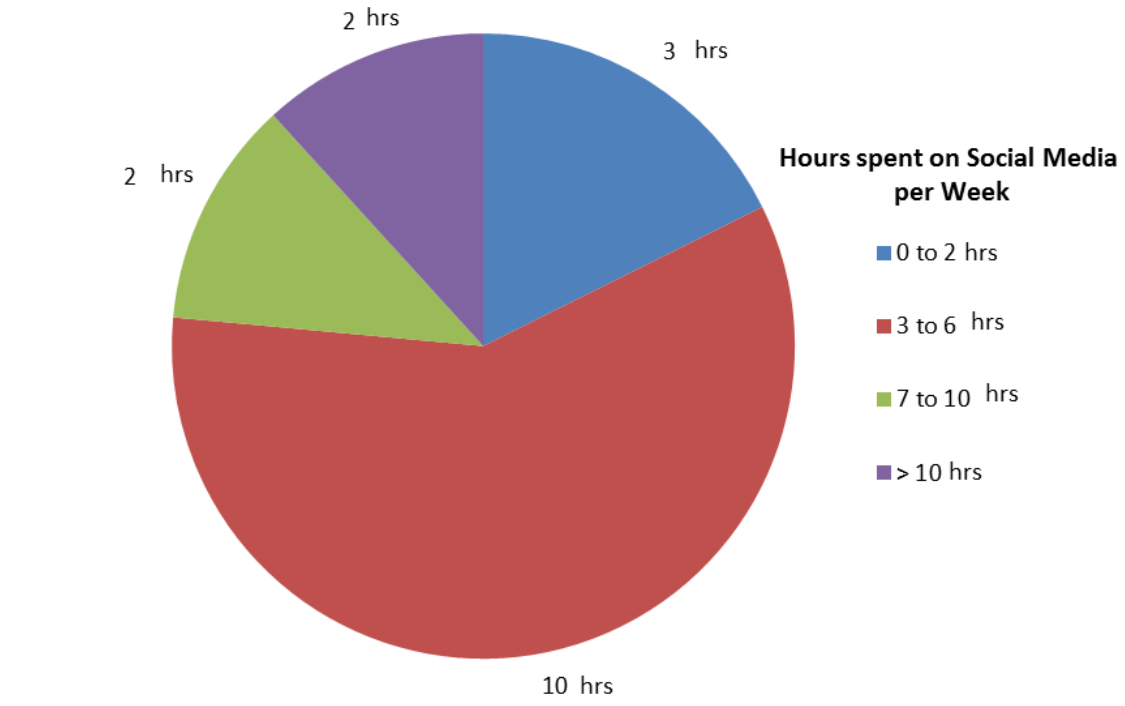
Figure 2: Hours per Week Participants Spent Using Social Media
2 hrs
3 hrs
2 hrs
10 hrs
Hours spent on Social Media per Week
0 to 2 hrs
3 to 6 hrs
7 to 10 hrs
> 10 hrs

Table 2: Participants'Perceived Benefits and Barriers of Using Social Media

	Benefits	Quotes	Barriers	Quotes
For Providers/ Institutions	<u>Forward Career/Research</u> Marketing, Publicity, Branding Networking/ Sharing ideas New Research/Career Opportunities Low Cost Repository for Information Improvement in Clinic Efficiency	It "doesn't cost much in terms of money… and it can lead to other opportunities (for the provider). It can lead to more media outreach, speaking engagements, opportunities to teach, promotion for your practice, i.e. 'free' publicity."	<u>Time/Work requirements</u> Keeping current with content Researching content Composing/posting content Listening to/responding to comments Needing to update regularly	"Time is a biggie. And training to some extent, although I think that most people these days get how to use social media. Using it well to communicate health information and thoughtfully so you're not misunderstood and get in medical or legal trouble, that's different."
	<u>Self-improvement</u> Learning (staying current) Listening to patient views/ understanding patient needs Teaching (medical education)	"As soon as the new blood pressure guidelines came out, people started tweeting about them. I know about it 'cause I'm following people who pay attention to that on twitter. It's a good way to keep up with what thought leaders are talking about."	<u>Skill requirements</u> Social media know-how Unfamiliarity with tools Unfamiliarity with etiquette/rules Constantly evolving environment Communication skills Media skills	"When I started, I literally had never heard of a blog before… and so the stumbling block was going from never even using it to being it (social media)." "Number two is that it's an evolving field." "Another barrier is knowing how to write. People go to college to learn how to do this. Most doctors don't know how to do this."
	<u>Increasing Reach</u> Providing accurate information to more people (correcting misinformation) Amplifier effect (physician 'voice') Amplifying ideas Where patients are at, especially kids Where patients get information	"We realized that each of us could see maybe 20 to 25 patients a day, but on social media, we could reach hundreds or thousands of patients a day." "It seems that everyone turns to social media for information. When I go to google something, I almost always end up on a social media site."	<u>Lack of institutional support</u> Lack of reimbursement Ignorance of benefits Oldschool mentality Lack of models/guidelines Lack of reimbursement	"People are old in the healthcare system. They're scared and don't know how to use the medium…There is a 19th century mentality at the level of academic medicine. I think it's an old world-new world mentality. Healthcare's been stuck in this 19th century rut."
	<u>Independent/Unregulated Venue</u> Place to express opinions It's FUN Camaraderie	"I found that I really enjoy twitter for learning and connecting with people and building relationships. There aren't many of us, the physicians in this space. This is the best and easiest place to find them (other physicians)."	<u>Fear of saying the wrong thing</u> Saying something unprofessional Breaching patient privacy (HIPPA)	"Barriers like if you post something that you shouldn't have. You can take back something you've said, but to have something out there that can be re-tweeted or re-purposed."

			Negative response Providing misinformation	
			Lack of models/guidelines	
For Patients/ Communities	<u>Source of health information</u> Source of 'accurate' health information Source of 'trusted' health information Source of 'understandable' health information Source of 'current' health information Source of 'targeted' health information Source of information outside the clinic visit	"It can provide accurate information from evidence-based research. I can provide a summary of an article in terms that parents can understand instead of them just reading information from the latest celebrity."	<u>Poor access</u> Language barriers Mental disability Older generation Lower SES (Medicaid patients) Literacy/Education barriers	"The main reason I don't use it in my own patient care is because the patients I care for have problems with access. For the most empowered, educated patients, it might be useful. That's not the kind of people I take care of in an urban underserved hospital."
	Low cost for patients	The benefit "to the patient is that it's free healthcare."	Lack of physicians with similar backgrounds	
	Community Outreach/ Input/ Engagement	"It increases the reach of the message and allows me to interact better. It's not about broadcasting, it's about being there and being more accessible for people"	Distinguishing credible information	"the general public not being able to distinguish what's credible on the internet"
	Accessible	"Just today, I've gotten emails, pings, hits, likes from 8 different countries. It runs the gamut. I have people from India or Malaysia who probably make dollars per day to presidents of companies who ask for second opinions. It helps to level the playing field."		
	Health Behavior Change	"We're trying to educate people who are misinformed. For good or for bad, social media is very good at changing opinions."		
Both	It's fast (quick exchange of information)	"When you email them, you don't get a response. When you tweet them, it's literally a one min response."	Lack of social media know-how	"Honestly, I am my own barrier. I'd never heard the word blog until 5 years ago. I'm still learning. My 14 year-old to tells me how."
	<u>Improved doctor-patient</u>	"It also allows you to maintain a	Lack of privacy	"You can almost trace everybody back.

	relationship Breaks down professional barriers Increases communication	relationship with your patient population on an ongoing basis. About half your patient population is only going to come in once a year or twice a year. How do you stay in touch with that population, make sure they come back, make sure you can provide them information? It helps them and helps them appreciate you as a physician."		What's that they say? 'On social media, it's written in pen not pencil."

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