Patients’ Adherence to Health Advice on Virtual Communities: Identity and Bond Theory Perspective

Research-in-Progress

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Abstract

The Internet is becoming increasingly popular and powerful as a healthcare delivery tool. Health community websites in particular have enabled patients to collectively conduct healthcare related activities. Considering the enormous benefits, physicians and organizations can effectively use online community based websites to deliver healthcare and promote health management practices. Using identity and bond theories as main theoretical lenses and synthesizing literature from social-psychology, we study how different features of online health communities can increase its members’ acceptance and adherence to health advice they receive online. With the collaboration of a leading healthcare institution, a field experiment will be conducted to test the hypotheses. Our study is one of the first studies in IS to investigate the actual impact of an online health community based intervention. This study provides several theoretical and practical implications in the areas of online communities, health behaviors and attachment literature.

Keywords: Patient attachment, social presence, cognitive presence, virtual communities
Introduction

The use of Internet as a tool for healthcare has grown dramatically in recent years, and this trend is expected to grow. Internet-driven health information revolution has reshaped the conventional healthcare delivery (Jadad 1999). Particularly, in online healthcare communities, with the increased use of user-generated content, information sharing is seen to be more democratic and patient controlled (Hawn 2009). Online healthcare communities are established based on the sole purpose of interconnecting people with common health interests in a virtual environment (Demiris 2006). It has enabled people with common interests to gather virtually and thereby collectively conduct activities related to healthcare and education. For example activities such as sharing experiences or discussing health and treatment related issues. A supportive social network has the potential to facilitate successful self-management by encouraging, educating or motivating each other (Gallant 2003). Considering the enormous benefits of e-health revolution, healthcare practitioners can effectively utilize Internet-based interventions in promoting better self-health management.

Self-health management is of particular importance for patients with chronic conditions. One of the deficiencies in current management of chronic conditions is that patients are inadequately trained to manage their illness (Norris et al. 2001). Physicians have limited time to spend on each patient who requires emotional or practical support in healthcare management (Kuehn 2011). Yet patients by themselves are not able to develop self-regulation of activities that are useful to them unless they are also interested in those behaviors (Deci et al. 1994). The ability to improve patients' medical self-management using the Internet has been shown in several studies (e.g. Feenberg et al. 1996; Johnson et al. 2001; McKay et al. 2001). This body of research has addressed online health community based interventions from perspectives of (1) users: such as user participation and contribution (e.g. Liu and Chan 2011), characteristics of users (Cotten and Gupta 2004); and (2) support: such as quality versus quantity (e.g. Ferguson 2002; Huang et al. 2012), emotional versus informational (Braithwaite et al. 1999) etc. Few studies have examined the actual outcomes of online communities from the perspective of the information receivers. There is also little evidence on the actual benefits to users who seek health information and advice through the online health communities.

Websites such as PatientsLikeMe and DailyStrength provide a wide range of peer generated health information covering various aspects from diagnosis to treatments. On the other hand, professional health bodies such as Mayo Clinic, Singapore Health System (healthBook) and Novartis (CFvoice) are already practicing online community based interventions in health promotion. However, the challenge arises when attracting patients to actively participate in such interventions. Thus, we seek to study the extent to which patients are actually willing to follow the health advice they receive online and whether this information can make significant health behavior changes in individuals. However, since health professionals do not author and assess an extensive portion of online health information, credibility of the user generated content is questionable (Eastin 2001). Thus we also explore ways to alleviate this issue. By conducting a field experiment at a leading healthcare institution in Singapore, we are empirically testing a model to understand ‘how different features of online health communities can increase its members’ acceptance and adherence to health management advice they receive online’.

Background

Health advice on virtual communities

Statistics of Pew Internet survey (20112) reveals that up to 80% of Internet users in the United States have looked for medical information online and the percentage has rapidly increased in the past decade. According to Pew Internet survey 2011, a high percentage of online health consumers perceive online information as reliable. Moreover, Harris poll 2011 shows that, online health consumers who say that they believe the information they obtained was reliable have risen in past years (90% in 2011 from 87% and 85% in the two previous years). Online health communities in particular are becoming increasingly popular. Health 2.0 has enabled both physicians and patients to create online content. Physicians contribute from their expertise knowledge, while patients mainly contribute from their experiences.
Because of the increased connectivity and the facilitation of user-generated content, online communities have become platforms of enabling ‘evidence-based medicine’ for patients (e.g. Frost and Massagli 2008). The information obtained from healthcare-related searches can affect peoples’ decisions about when to engage a physician for assistance, how to treat an acute illness or cope with a chronic condition and their overall approach in maintaining their health (White and Horvitz 2009). Therefore, a growing body of research is attempting to explore the consequences of widespread availability of online health information. Past research provides evidence for both positive effects (Misra et al. 2008) and unintentional negative effects (Gallant 2003) of patient acceptance of online health information. While online information helps patients to take informed decisions, it has also raised concerns among medical professionals (Kassirer 2000). As influence of online health communities as a valid source of medical care is continuing to grow, caution should be made in providing the public with relevant and reliable information. Although, all the virtual healthcare communities serve under the common objective of increasing patient connectivity and information reach, the underlining features of the communities would differ.

**Patient attachment to online healthcare communities**

Online healthcare communities are increasingly gaining recognition as a platform to interconnect and support health consumers (e.g. professionals, patients and caregivers). With the advancement of Web 2.0, virtual communities have become effective tools for providing emotional and informational support to its members (Eysenbach et al. 2004). These new technologies have shifted face-to-face delivery of support to a new level. In-contrast to the limited social interactions in the physical environment, individuals are able to connect to a wider network of people and establish a greater number of social connections via virtual communities. However, the quality and the value of such relationships are questionable. In offline contexts, patients usually bond with their immediate family or close friends, whom they consider as a ‘significant other’ to turn-up for help and advice. Extent literature suggests that individuals attempting to change health behavior can be positively influenced by significant others (Zimmerman and Connor 1989). Moreover, people develop stronger relationships with ‘similar others’ and they are much more effective in persuasion because of their strong attachment to each other (Ciechanowski et al. 2001; Frable et al. 1998).

Towards this end, in an attempt to promote better health via online communities, patients’ strong attachment to the community will create an effective channel to convey healthcare messages successfully. Anecdotal evidence suggests that success of online communities depends solely on users’ voluntary participation and commitment (Kim et al. 2004). Hence, in recent years research efforts have been taken to identify mechanisms for building community attachment to maximize user participation (e.g. Ren et al. 2012). Past research suggests that the opportunity to self-disclose personally revealing information about the members will help to establish much stronger interpersonal bonds (Collins and Miller 1994). However, in-contrast to other online communities, health communities raise concerns about privacy, confidentiality and security of revealing personal information (Gostin et al. 1993). Moreover, privacy and anonymity are main concerns for why individuals turn to the Internet for health information and support (Cotten and Gupta 2004). Therefore, patients are less likely to unveil their true identities to the online community. Challenges to health communities arise when building member attachment in such an environment.

**Theoretical background**

Patient adherence to professional health advice is an issue that has been widely addressed in the field of medicine (Review of Vermeire et al. 2001). In particular, for patients with chronic conditions, continuous health management and long term adherence are essential for their wellbeing (Warsi et al. 2004). In offline contexts, community-based self-management programs have demonstrated effective outcomes in patients’ adherence to health advise (Lorig et al. 1999). With online health websites increasingly changing the traditional health system, professionals and organizations are exploring effective mechanisms through the exploitation of ‘eHealth’ to guide patients in self-care (Forkner-Dunn 2003). The conceptualization of our research model is based on the identification of online healthcare community features that enable building member attachment in the community. First, using literature from social psychology, the model theorizes several online health community features to examine how they can build member attachment. Second, adopting identity and bond theories as main theoretical lenses, we hypothesize how attachment could influence patients’ acceptance of health advice that they receive online.
Common identity and bond theory

Health consumers commonly engage in online communities to seek support, empathy and a sense of belonging amongst people experiencing similar conditions (Lau and Kwok 2009). In social psychology, the pursuit of connectedness has been studied as a basic motivating principle which triggers social behaviors (Rettie 2003); the fundamental need for belonging and connectedness promote social relationships. Connectedness orientated communication can be defined as ‘exchanges that allow people to be aware of each other and contribute to maintaining social relationships’ (Kuwabara et al. 2002). The extent to which a community generate a sense of belongingness within members differ with communities.

Theoretical development of Ren et al. (2007), identifies two ways of developing attachment in a group: identity based and bond based. The distinction between identity and bond refers to people’s different reasons for being in a group (Back 1951). First, through common identity, members develop attachment with the group as a whole. When the attachment works through identity, people feel connected to the group’s purpose (Hogg and Turner 1985; Ren et al. 2007). Common identity in the online context implies that members feel a commitment to the online community’s purpose or topic (Ren et al. 2007). As members in a group share a common purpose they identify with the group’s purpose as a whole (Ren et al. 2012). The review of Ren et al. (2007) identifies three causes of group identity: social categorization - defines a collection of people as members of the same social category, interdependence – is the co-dependence of members in joint tasks, rewards or in common objectives; finally, intergroup comparison - members of a group compare themselves with other groups which intensifies people’s commitment to their in-groups. On the other hand, common bond attachment implies that members feel socially or emotionally attached to individual members (Hogg and Terry 2000; Ren et al. 2007). Following the categorization of Ren et al. (2007), there are three main causes of bond based attachment: member interactions – opportunity to get familiar with one another, when the frequency of interaction increases, attachment to one another will also increase, personal information – exchange of personally revealing information with one another; finally, personal attachment through similarities - people are likely to interact with similar others who have similar attitudes, preferences or experience similar life events.

Social presence and cognitive presence

Cognitive presence: The community of inquiry model (Garrison et al. 1999) identifies three elements of presence in an asynchronous computer mediated learning environment: social presence, cognitive presence and teaching presence (teaching presence focus on designing, managing and facilitating active learning). Garrison et al. (1999) defined cognitive presence as “the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication.” Cognitive presence is an important element in critical thinking (Garrison et al. 1999). Initially adopted in online education communities, cognitive presence facilitates higher levels of thinking and learning (Kanuka and Garrison 2004). According to Garrison et al. (1999) cognitive presence is operationalized through a cycle: triggering event, exploration, integration and resolution. When the features of the communication medium facilitate users to go through these four phases, their perceptions of cognitive presence become high (Garrison et al. 2001; Vaughan and Garrison 2005).

Social presence: Researchers have extensively looked into how people develop perceptions related to a sense of presence in online communications (IJsselsteijn et al. 2000). This concept has been initially studied in computer mediated learning environments (e.g. Gunawardena and Zittle 1997). It is defined as the ‘degree of awareness of another person in a social interaction and the resulting appreciation of an interpersonal relationship’ (Walther and Burgoon 1992). The degree of social presence is determined by both media characteristics and user perceptions (Tu and McIsaac 2002). The concept of social presence has been widely identified as a requirement that enhances and fosters online interactions (e.g. Richardson and Swan 2003). Tu (2000) identified three dimensions of social presence. First dimension, social context includes factors such as task orientation, privacy and social relationships (Walther 1992), which has been shown to be influential in determining one’s perceptions of social presence in an online environment. The second dimension, online communication, can be identified as the personal determinant which is related to the language used in online communication. This dimension captures users’ ability to understand or evaluate online information (Tu and McIsaac 2002). Finally, interactivity relates to the activities that users engage in and communication styles (Tu 2000).
The concept of presence has been examined in a number of disciplines and also in a variety of contexts: For example in interpersonal, organizational, and group-level communications and in studies of decision making (Mennecke et al. 2011). Online health communities are formed based on the central premise of exchanging support. Focusing on the community website characteristics that enable presence, our study explicates two elements of the community of inquiry model, social presence and cognitive presence.

**Table 1: Definitions**

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition (i.e. dimensions are re-defined based on Garrison et al. (1999))</th>
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<tbody>
<tr>
<td>Social Presence</td>
<td>The ability of the online healthcare community to facilitate to project one’s self and establish personal and purposeful relationships with other members</td>
</tr>
<tr>
<td>Cognitive Presence</td>
<td>The ability of the online healthcare community to facilitate participation, exploration, and confirmation by understanding through collaboration and evidence from the community</td>
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**Model development**

The research model is presented in Figure 1. The dependent variable is patients’ willingness to adhere to healthcare advice they receive from the online community. The model depicts the hypothesized relationships between online community features, attachment, and adherence. Online communities can be differentiated along two functions: communities in which members share a common purpose (similar identities as we discussed before) and communities that promote interpersonal bonds (Ren et al. 2012). An online community can have both functions. For example, DailyStrength.com is an online community that allows members to build up their own friendship network while participating in special interest groups (e.g. weight-loss support group). Here, we focus on online communities with both functions. Using the literature from community of inquiry model (i.e cognitive presence and social presence), we examine

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**Figure 1. Research Model**

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health community characteristics that foster online health communities. Community characteristics are identified along two levels. Group level includes the online community characteristics that enable patients to interact as a group, for example individuals can start a discussion on group's profile about a certain treatment and ask others to join. Individual level characteristics enable patients to communicate with group members directly, for example patients can post on other patients' profile pages.

**Influence of community characteristics on member attachment**

**Group level:** A healthcare community that is been established with members experiencing same illness conditions can be viewed as a special interest group striving towards the same goal of achieving better health. Health community websites provide options for its users to form groups and enroll in specific interest groups. *Intra-group reciprocity* is the feature that enables members to actively engage in reciprocal group level communications. It enables members to actively engage in discussions with other members who post in the group’s profile, thereby triggering social presence (SP) at group level. In such an environment reciprocity can be defined as ‘exchange of information with others for mutual benefit’. Past research has shown that people help others with the expectation that their help will be compensated either by those they have helped or by the group as a whole (Blau 1964). When a group is interdependent in nature, members tend to expect high reciprocity from other group members. As a result when the communication medium allows group level reciprocal communications, it gives individuals a sense of being with a group of similar others (Biocca et al. 2003; Lowry et al. 2006). It has been shown that interdependence can cause feelings of common identity in online communities (Ren et al. 2007).

**H1a:** Enablement of intra-group reciprocal communication is positively related to patients' perceived identity-based attachment.

_Aggregated patient content (APC)_ is the feature that can trigger cognitive presence (CP) at group level. APC enables information seeker to obtain an aggregated view of information about actual patients in the community. It emphasizes on the aggregation and consolidation of the personal health data extracted via member profiles. For example with this feature, users can view consolidated statistics on health conditions, treatments, and symptoms of other users within the community. It can also give an overview of the illness condition, such as its top symptoms and treatments, as made available by the members of the healthcare community. With APC, more structured and cohesive communication of information is provided to patients so they can engage in a higher level of critical thinking and knowledge accumulation (Aviv et al. 2003; Pawan et al. 2003). Patients can better evaluate and compare the information shared by members within community. Armed with a more comprehensive understanding of the experiences of real patients in the communities, patients can build a better knowledge of their illness and possible treatments. A better understanding of the group will in turn make individuals feel more attached to the group (Ren et al. 2007), because it provides means of confirmation about how other members in the community as a whole are similar to one's self. Thus we propose that:

**H1b:** Provision of aggregated patient content on the health community website is positively related to patients' perceived identity-based attachment.

**Individual level:** In asynchronous online environments where the response immediacy is low, feelings of low interactivity can lead to low perceptions of social presence (Tu 2000). *Interpersonal reciprocity* enables members to establish dyadic ties with community members. It is the feature that gives members a sense of social presence (SP) at individual level. For example: posting on other member profiles and engaging in one-to-one discussions can be identified as activities of this feature. Interpersonal communication is a major determinant in building relationships with one another (Ren et al. 2007). In online environments, media should overcome the burden of asynchronous communication when building relationships. If the community website facilitates increased interactivity between patients, they are likely to develop much stronger bonds with individual patients in the community, resulting in higher attachment between individuals.

**H2a:** Enablement of interpersonal reciprocal communication is positively related to patients' perceived bond-based attachment.

People often look for information of others with similar health conditions (Preece 2001), and tend to compare and evaluate them. Evaluation of social comparison information has a high impact on cognitive,
affective and behavioral outcomes of patients (Klein 1997). People often search for actual information and compare their own circumstances with those of others (Maitland and Chalmers 2008). Symptomatology comparison feature, gives users an effective mean to compare own symptoms with other patients. It enables one to one comparison with other patients who experiences similar situations. When patients share comparable experiences and face similar challenges, they will experience significantly lesser loneliness and withdrawn behaviors, and develop a sense of ‘companionship’ with fellow patients (Johnson and Ambrose 2006). Under taxing situations, people often seek for support from the immediate network they are connected to. Considering the tendency of people to look for the information of others with similar health conditions (Preece 2001) and often trust a ‘person like me’ more than authority figures or professional bodies (Sarasohn-Kahn 2008), online communities can exploit means of building member attachment through patient similarities. Thus, if the website enables effective means to find out about others with similar conditions, members will get more connected with those similar others.

H2b: Availability of symptom comparison feature is positively related to patients’ perceived bond-based attachment.

Professional endorsement: In light of directing patients toward healthy behaviors, health professional endorsement in the community could provide useful verification of patient generated content. At the group level, professional endorsement is the feature that enables medical or health professionals to generate content for the benefit of the community. For example, physicians are able to endorse in discussions started by patients on group’s profile page or start and lead discussions related to treatments, life style modifications, diagnosis etc. At the individual level, medical professionals can establish dyadic ties with community members. By identifying issues or healthcare needs of individuals, they are able to engage in one-to-one discussions with patients in the community. For example, provide occasional comments and posts on individual profiles or address queries from individual members. Empirical evidence suggests that patients tend to seek for online professional support than non-professional support when they need accurate diagnosis and accurate information on treatments (Kuehn 2011). Active engagement of health professionals in communities could ensure a reliable information source for patients. An online community which provides a reliable and comprehensive information base will make externally driven governance unnecessary for patients (Maloney-Krichmar and Preece 2005). Thus, we propose that in an environment where health professionals actively engage in community activities, patients will be more attached to the group and to other individuals.

H1c: Professional endorsement is positively related to patients’ perceived identity-based attachment.

H2c: Professional endorsement is positively related to patients’ perceived bond-based attachment.

Influence of attachment on willingness to adhere to online health advice

Individuals’ attachment has shown to be closely related to, satisfaction on community-level activities (Theodori 2004), productivity, commitment (Balfour and Wechsler 1991; Graen et al. 1982) and on work effectiveness (Cohen and Bailey 1997). In online communities, member attachment to the community is a significant factor determining member participation, retention and willingness to help others (Ren et al. 2012). Past studies show that attachment either to a group or to individuals will lead members to attach to the community as a whole (Ren et al. 2012). In healthcare communities, patients usually seek for support, empathy and expect a sense of belonging amongst the people experiencing similar situations (Lau and Kwok 2009). Past research has shown that when patients are with others who share comparable experiences and faces similar challenges they experience lesser anxiety and resistance towards their treatments (Johnson and Ambrose 2006). As stated in Gallant (2003), illness self-management does not occur in a vacuum but rather in a context which includes physical environment, informal social network and formal health care providers. A patient’s attachment to a supportive network have beneficial effects on the motivation, coping, and psychological wellbeing of the patient (Wortman and Conway 1985). Attachment to the group either through bond based or identity based mechanisms will cause patients to perceive the group and individuals in the group as ‘significant others’. As a result, when patients are embedded in a supportive and significant (as patients perceives) environment they are likely to adhere and comply with the guidelines and best practices offered in the community. Thus we hypothesize that:

H3a: Perceived identity-based attachment to the group is positively related to patients’ willingness to adhere to online healthcare advice.
**H3b:** Perceived bond-based attachment to individuals is positively related to patients’ willingness to adhere to online healthcare advice.

Cohen and Wills (1985) proposed buffering models to explain the mechanisms by which social relationships influence health related behaviors. The stress-buffering model posits that social ties are related to well-being only for persons under stress, and the model asserts that social connections benefit health by providing psychological and material resources needed to cope with stress (Cohen 2004). Chronic conditions in particular are long lasting and required continuous management. Such conditions can also arouse intensive psychological feelings like anxieties and depressions (Scott et al. 2007). Recipients of persuasive communication may arrive at judgments by one of two ways (Petty and Brock 1981): 1) they may carefully consider the content of the message by paying attention to the implications stated in the argument 2) they may accept the message without thorough consideration of the content. Further, in the second mechanism, message recipients may simply rely on cues such as communicator likableness or prestige (Schwarz et al. 1991). It has been shown that when patients perceive greater levels of negative feeling of their health conditions, their vulnerability can lead them to seek for more health information from others. Therefore, when patients experience greater levels of negative emotional feelings their vulnerability might lead them to rely on the community more. Therefore, if members experience greater levels of negative emotional feelings and if they are highly attached they are more likely to adhere to the illness related advices they receive from the community. Thus we hypothesize:

**H4a:** Negative emotional states moderate the relationship between perceived attachment to the group and adherence behavior, such that the relationship is stronger under greater negative states.

**H4b:** Negative emotional states moderate the relationship between perceived attachment to the individuals and adherence behavior, such that relationship is stronger under greater negative states.

**Research methodology**

A field experiment will be conducted to test the hypotheses. A field experimental approach is suitable for our study because it allows us to examine the effectiveness of our intervention in the real world. An experimental online health community website has been developed and will be deployed for use in a health management program affiliated to a leading public hospital in Singapore. The website consists of special interest groups established based on common illness conditions and facilitated by social network features. As we discussed above, we are introducing two sets of features (group level and individual level) aiming to increase member attachment by giving patients a greater sense of community attachment.

The research design includes a full factorial design of three website features that builds member attachments. As there are three high level features (SP, PE, CP), our factorial design will include \(2^2 \times 2^2\) number of conditions. i.e. similar website features of two categories will be manipulated together to examine their effects on two types of member attachment (identity-based and bond-based). For example, features that trigger cognitive presence (CP) - aggregated patient information (group level feature) and symptomatology comparison (individual level feature) - will be manipulated simultaneously. Further, we are also interested in examining the separate effects (by enabling features of either group level website characteristics or individual level characteristics and controlling for the other level) of each attachment type on patients’ adherence to health advice. This research design will permit us to examine the distinct effects of the features of different levels and their combined effect as well.

Study participants will be recruited on a voluntary basis from a health management program for patients diagnosed with a chronic illness (e.g. high cholesterol) condition. These patients are suitable subjects because they possess the required levels of motivation to strive towards a behavioral change. The subjects will be randomly assigned to different treatment groups. Survey data will be collected to measure patients’ perceived attachment to the group and individuals, emotional states and willingness to accept health advice. Objective data will be collected based on clinical indicators (e.g. cholesterol levels) measured during patients’ follow-up visits. The survey will be conducted at regular intervals over a period of 12 months to capture any variations in individual perceptions across time.

All the constructs will be either operationalized based on previously validated instruments or will be developed based on the definitions of the constructs. The dependent variable will be measured in two stages. First, community members’ perceptions of the extent to which they are willing to adhere to the
online healthcare advice will be measured using a multi-itemed survey. Second, objective data will be
gathered to measure the actual behavioral change of individuals. The two types of patients’ attachment to
the online community will be measured using self-reported measures. We are adapting previously
validated instruments from (Ren et al. 2012) and Sassenberg (2002) to measure the two types of
attachment: 1) attachment to their specific group in the community (identity-based), 2) attachment to
individual members in the community (bond-based). For example, this scale includes measures such as “I
feel connected to the group” and “I am interested in learning more about [member names] health issues”.

Patients’ emotional states will be measured using self-descriptive psychometric properties such as “worry,
anxiety and nervousness” (Tellegen 1985). The literature addressing moods and affective states addresses
two mechanisms where individuals’ psychiatric properties may influence persuasion process depending
on the processing stage of an argument (Schwarz et al. 1991) . Emotional states may have an influence
either at the time of exposure to the message or at the time of judgment. At the time of exposure to the
message, negative emotional states may influence individuals to react on peripheral cues such as
properties of the communicator or the message characteristics (Schwarz et al. 1991). In our research we
are measuring the influence of emotional states at the time of the exposure to the online information
containing health advice. The “Emotional States Questionnaire (EST-Q)” (Aluoja et al. 1999) will be
tailored to assess the emotional states. Sample items in this measurement are “Tension or inability to
relax” and “Feeling anxious or fearful”. At regular time intervals perceptual constructs will be measured
using an online survey distributed via the community website, which will pop-up when users navigate
through the site. This allows us to capture individuals’ psychometric properties at the time they are
exposed to the information.

Conclusion

This study provides important theoretical implications for research on online communities, health
behaviors and attachment literature. First, it is one of the first studies in IS to investigate the actual
impact and patients’ perceptual changes related to online health communities for self-healthcare
management interventions. Second, this study advances the literature on social and cognitive presence by
extending the boundaries used in the previous literature. While, the concept of ‘presence’ was previously
studied in the context of learning, this study suggests it can be applied in contexts of online health
communities too. Third, theories of attachment were widely studied in offline healthcare groups. The
theory has been recently applied to study member attachment of an online movie related community (Ren
et al. 2012). However, online health communities are different in nature and our study explores health
community features that help to build member attachment. Finally, most importantly, our study examines
the effectiveness of an IS intervention to improve health behaviors. Although, previous healthcare
literature has addressed the Internet’s power of influencing patients in improving their health (review of
Griffiths et al. (2006)), the effectiveness of a systematic community based intervention with high levels of
professional involvement has not yet been studied.

This study also offers important practical implications for physicians and online health community
operators. Physicians have less time to spend with each patient, and more ground to cover in each visit,
thus they may not have much time to offer patients with emotional and practical support (Kuehn 2011).
This study will provide practical guidelines for health organizations to harness the benefits of online
health communities to improve patients’ healthcare behaviors. For online health community operators,
the findings would provide useful prescriptions in designing online communities with higher attachment.
In our current research, we will be considering different versions of the website by enabling different
features for different experimental groups. Future research will be carried out to come up with rigorous
indicators to measure the actual usage of different features when the entire community is provided with a
full version of the website. Objective data of actual usage would be used to assess the actual level of impact
of each feature on different types of attachment.

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