Practitioner-driven Virtual Communities: An Attachment Theory Perspective to Patients’ Adherence to Online Health Advice

Research-in-Progress

Nadee Goonawardene
Department of Information Systems
National University of Singapore
Singapore
ngoonawa@comp.nus.edu.sg

Sharon Swee-Lin Tan
Department of Information Systems
National University of Singapore
Singapore
tansl@comp.nus.edu.sg

Abstract

With the rapid growth of social networks and the increased rate of adoption by patients, healthcare organizations are progressively adopting online community-based initiatives to conduct healthcare activities. Considering the enormous potential online communities hold, for practitioners to get closer to their patients, online communities could be effectively utilized to conduct health management programs. Based upon the literature on attachment and social presence theory, we propose a research framework to examine the effectiveness of an online community-based health management intervention. Specifically, we study how different online community characteristics would influence how members become attached to the community and their adherence to health advice disseminated through the community. A field experiment will be carried out in collaboration with a leading hospital in a South-east Asian country to test the hypotheses. This study provides several theoretical and practical implications in the areas of online health communities, healthcare interventions and attachment literature.

Keywords: Virtual healthcare communities, health management, patient attachment
Introduction

With the worldwide explosion of social media, the use of online communities in the healthcare landscape has grown dramatically in recent years. Although healthcare communities already existed in the era before the World Wide Web, the primary medium for virtual communities today is the Internet (Eysenbach et al. 2004). Online healthcare communities can be seen as social support groups, whereby patients with similar interests gather virtually to collectively conduct activities related to healthcare and education. As the popularity of online health communities grow, the healthcare paradigm has started to shift away from physician-centricity and more towards patient-centricity (Calabretta 2002). Moreover, as the traditional delivery of care is rapidly getting reformed, healthcare organizations are increasingly paying attention to online community based initiatives to get closer to their patients.

The importance of maintaining close relationships with patients has been widely accepted in the field of medicine (Rooney 2009). It has been linked to increased healthcare outcomes, adherence to treatments (Ciechanowski et al. 2001), patient satisfaction and retention (Barksdale et al. 1997), and post-care health management (Heisler et al. 2002). However, a current deficiency in healthcare is that physicians have limited time to spend with each patient but more ground to cover in each visit (Kuehn 2011). This limits the opportunity of getting closer to the patients who need support and guidance in health management. Online communities can potentially address this issue. First, online communities enable physicians to connect to a larger audience of patients. Second, online communities provide an effective channel to disseminate the support that is essential for patients’ wellbeing. Therefore, the right use of virtual communities would open up an effective avenue for healthcare providers to maintain close connections with their patients and drive them towards better health. The ability to improve health outcomes through online communities has been addressed in several studies (e.g. Johnson et al. 2001; McKay et al. 2001; Winkelman and Choo 2003). This body of research has addressed areas such as patient empowerment (Winkelman and Choo 2003), participation (Nonnecke et al. 2006), patient experience (Nambisan 2011) etc. However, there is little research done in understanding the underlying mechanisms in which professionally lead healthcare communities could influence patients. There is also little evidence in IS literature on the actual benefit a professionally driven online health community could bring to patients.

With online communities getting widely popular in the healthcare landscape, more and more organizations are adopting online communities as means to connect with patients (Kamel et al. 2007) and to conduct health behavior change programs (Maher et al. 2014). In online community-based health behavior change interventions, members are bonded by a common practice (Winkelman and Choo 2003) and the success of the intervention is largely dependent on the active engagement of the members. Moreover, as the goal of such communities is to improve health outcomes of its members, the extent to which they are willing to follow the health advice received from the community is an important indicator for the success of the intervention. Therefore, focusing on practitioner-hosted online healthcare communities, our research examines the mechanisms that could influence patients’ willingness to follow the health advice they receive from the community. Specifically we investigate how different activities of healthcare professionals and patients in the online community space would influence the extent to which patients are willing to follow the advice they receive from the community and whether this information could make significant health behavioral changes in individuals by directing them towards better self-health management. Through a controlled field experiment using a community-based healthcare platform affiliated to a leading hospital in South-east Asia, we are empirically testing a model to address the research question: ‘How could practitioner-driven virtual healthcare communities increase patients’ adherence to healthcare advice they receive from the community?’

Background

Practitioner-driven virtual healthcare communities

In recent years, hospitals have progressively adopted online community-based initiatives to connect with patients, manage patient-care, coordinate population health (Keckley and Hoffmann 2010), and to exchange clinical information (Frisse et al. 2012). For example: AT & T Healthcare Community’s Online Physician Portal is a secure portal that exchanges clinical and administrative data to enable the coordination and management of patient-care and population health (AMA 2012). Further, professional
healthcare organizations such as Singapore Health System (healthXchange and HealthBook), Norvaties (CFV voice) and Mayo Clinic are practicing online community based interventions to promote healthcare.

Although, all the virtual health communities are built with the purpose of connecting people to exchange support and promote better health, the underlying objectives would differ. Virtual communities are commonly distinguished into two categories based on the purpose: communities of interest (CoI) and communities of practice (CoP) (e.g. Li et al. 2009). A CoI could be identified as a ‘virtual gathering of people assembled around a topic of common interest’ (Henri and Pudelko 2003). The activities of a CoI do not correspond to a collective endeavor. In CoI, members do not expect others to share their individually appropriated knowledge and do not feel responsible for sharing how they individually use the knowledge (Henri and Pudelko 2003). On the other hand, CoPs emerge from collective activity and are created with the goal of gaining and sharing knowledge to support each other to have an opportunity to develop (Lave and Wenger 1991). Moreover, members of a CoP share a common concern, a set of problems or a passion about a topic and they deepen their knowledge by interacting on an ongoing basis (Wenger et al. 2002). Electronic Networks of Practice (NoP), a concept that originated from CoP, refers to computer mediated forums focused on problems of practice that enable individuals to exchange advice and ideas with others based on common interests (Brown and Duguid 2002; Wasko and Faraj 2005). People in such networks have practice and knowledge in common and links between members are more indirect than direct (Brown and Duguid 2002).

Towards this end, an online healthcare community hosted by a professional healthcare provider can be identified as an electronic Network of Practice of patients that share personal expertise, experiences, perspectives and exchange support related to health management (e.g. Winkelman and Choo 2003). In such a context patients are bonded by a common interest of managing a specific health condition. For example, overcoming obesity could be identified as a health issue, which needs a substantial degree of lifestyle modifications and continuous self-management. Therefore, we define a practitioner-driven virtual healthcare community as ‘an online community hosted by healthcare professionals with the aim of facilitating patients to establish useful social connections with similar others to better manage health’, so that with the tacit support of professionals, patients have a forum supporting the integration of knowledge and best practices to manage their health conditions.

**Patients’ attachment to practitioner-driven communities**

The effectiveness of community based initiatives in health management has been extensively examined in the medical literature (e.g. Review of Israel et al. 1998). In contrast to offline support groups, through online communities patients are able to connect to a wider audience of similar others and medical experts and establish a greater number of social connections. However, critics argue, because of the limitations in online communication, virtual communities are not able to facilitate the same type of interactions between individuals as in face-to-face support groups (Cummings et al. 2002; Maloney-Krichmar and Preece 2005). Therefore, the actual strength and the value of relationships built via virtual communities are questionable. Extant literature suggests that, patients usually seek support from the immediate social network which they perceive as significant and that network of people are much affective in persuasion because of their strong attachment (Frable et al. 1998). Moreover, patients’ strong emotional attachment to the physician has also been identified as an important determinant for the success of health management endeavors. Therefore, in an online environment, patients’ attachment to the community would create an effective channel to effectively convey health related advice and required support.

In the context of medicine, patients’ emotional attachment to physicians and access to a supportive network have been identified as having beneficial effect on health outcomes (Ciechanowski et al. 2004), adherence to treatment procedures and healthcare management (Ciechanowski et al. 2001). In contrast to the face-to-face communication that help nurture interpersonal bonds in offline health support groups, in virtual communities, activities done within the community space would determine the patients desire to engage in the community (Uden-Kraan et al. 2011) and the way they develop bonds with one another. Further hindering this limitation, professional healthcare communities must adhere to the rules and regulations imposed by health authorities on information sharing. Therefore, the challenge to healthcare communities would arise when building patient attachment through online communities.
Theoretical Background

Patients’ adherence to treatment procedures and healthcare advice has been widely addressed in medical literature (e.g., DiMatteo 2004; McDonald et al. 2002). The focus of our study is to investigate to what extent patients are willing to adhere to the healthcare advice they receive through a practitioner-driven online community. The online community-based healthcare interventions could play an integral role in directing patients towards better health management behaviors by providing informational and emotional support (e.g., Barrera Jr et al. 2002). However, the overall effectiveness of the intervention would largely depend on the interactions within the online community. In this study, we base our examination of practitioner-driven virtual healthcare communities on the attachment literature and the social presence theory. The conceptualization of our theoretical model is based on identification of the online community characteristics (i.e., behaviors of practitioners and patients) that foster community members (i.e., patients) relationships with the online community and the healthcare provider (i.e., practitioner). First, drawing upon the theory of social presence and the literature on communities, we identify a set of online community characteristics and theorize the mechanisms through which these characteristics influence patients’ perceptions of attachment. Second, adopting the literature on attachment, our model explicates two attachment-oriented mechanisms that may influence patients’ adherence to healthcare-related advice they receive through the community.

Attachment theory perspective

The theory of attachment (Bowlby 1958) describes the dynamics of relationships between humans. The theory was initially applied to explain the bonding between infants and the mother. Subsequently, the theory has been extended to explain the attachment behaviors in adults (Hazan and Shaver 1987) and defined attachment as an ‘emotion-laden, target-specific bond between a person and a specific object or a person’ (Bowlby 1979). The theory has been popularly used in healthcare studies to understand the nature of patient-physician relationship (Ciechanowski et al. 2001).

Patients commonly engage in online healthcare communities to seek support to empower themselves in order to better manage their health issues and to experience a sense of belonging amongst the people experiencing similar conditions (Lau and Kwok 2009). In social psychology, the need for belongingness and connectedness has been addressed as a basic motivating principle that triggers social behaviors (Rettie 2003). Connectedness-oriented communication can be identified as exchanges that allow people to be aware of each other and contribute to maintain social relationships (Kuwabara et al. 2002). Attachment occurs and develops when people get closer to share emotions (Thomson et al. 2005).

In an online community, the constraints and opportunities inherent in the design would influence how members become attached to the community (Hogg and Terry 2000; Ren et al. 2007). The attachment in an online community could take two forms: common identity and common bond. These two mechanisms theorize individuals’ different reasons to engage in an online community and the extent they are willing to expend effort on its behalf (Hogg and Terry 2000; Ren et al. 2007). When the attachment works through bonds, members feel socially or emotionally attached to individual members of the group (Hogg and Terry 2000; Ren et al. 2007). According to Bowlby, an affective bond is the attraction one individual has for another (1958). In healthcare communities, affective bonds between patients and physician have been linked to patient satisfaction, treatment adherence and, most importantly to treatment outcomes (Eveleigh et al. 2012). The effective communication between patient and a practitioner is widely cited as a prerequisite to patient attachment. However, in online healthcare communities, asynchronous communication and the community design could hinder the attachment development process. Theoretical development of Ren et al. (2007), identified three characteristics of virtual communities that cause bond-based attachment: interaction, exchange of personally revealing information and through similarities (e.g., similar preferences, attitudes). On the other hand, when the attachment works through common identity, people feel connected to the groups’ purpose and identify with the groups’ collective effort as a whole. According to Ren et al. (2007) there are three characteristics of virtual communities that cause common identity-based attachment: social categorization (defining a collection of members as members of a social category), interdependence among community members and intergroup comparison.

When the online community platform facilitates these aspects, members will be likely to become more attached to the community. Past research has shown that, individual differences in attachment style
reflect underlying differences in how people are likely to process the supportive messages they receive (Bodie et al. 2011). The attachment is thought to act as a schema that influences how new information is processed and construed (Collins and Feeney 2004). Therefore, we believe that, members’ different attachment mechanisms would generate a peripheral route that influences their intention towards acceptance of the healthcare information they receive from the community. Therefore, in our study, we assess patients’ attachment to the community along two dimensions: (1) patients emotional attachment to the practitioner, caused by affectional bonds, and (2) patients attachment to the online healthcare community caused by common identity.

Social presence theory

Social presence, defined as the ‘degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationship’ (Short et al. 1976), is an intra-individual sense that stems from and shapes the social context. Perceived social presence, the degree to which individuals perceive the presence of others (Salminä et al. 2000) in a particular social context, triggers significant psychological effects on behavior (Wapner and Alper 1952). Social presence theory argues that users of a particular medium assess the degree of social presence required by the task and tend to fit it to the social presence provided by the medium: how much the medium enables an individual to experience communication partners as being psychologically present (Short et al. 1976; Williams 1977). The literature identifies two key properties of interpersonal communication that trigger social presence in a virtual environment: intimacy and immediacy (Rice 1993). Intimacy has characterized as a function of ‘proximity, emotions, and personal topics of conversation’ (Argyle 1972) and immediacy is defined as the ‘directness and the intensity of interaction between two entities’ (Mehrabian 1977).

In social psychology these concepts have been applied to media to examine the role of nonverbal communication (Mehrabian 1977), and have been studied as qualifiers of media high in social presence could evoke during mediated social interactions (Biocco et al. 2003). Therefore, in online communities the extent the community can evoke intimacy and immediacy would influence individuals’ perceptions of presence in the online social context. Perceived social presence in online communities has been studied as an influencing predictor of satisfaction (Gunawardena and Zittle 1997), active participation (McWilliam 2012) and virtual togetherness (Bakardjieva 2003). Focusing on online healthcare communities, our study examines intimacy and immediacy as two triggering factors that induce social presence in an online environment.

Model Development
The research model (see Figure 1) depicts the hypothesized relationships between community members’ activities within the community space, patients’ attachment and the dependent variable: “Patients’ willingness to adhere to the healthcare advice received through the online support community”. Specifically, our focus is on online communities that are being created based on a common illness condition with the aim of improving patients’ health through community interactions (e.g. diabetes type 1 support group). These communities can be differentiated from publicly available healthcare communities (e.g. DailyStrength.com) along two aspects: the users are aware of the hosting body of the community and the membership is based on recommendations to ensure the homogeneity of the group. Therefore, it could be viewed as a community that strives towards a common objective of better managing members’ health. Firstly, using the literature on social presence, our model identifies community characteristics based on the extent to which they allow intimacy and immediacy in the online environment. Moreover, these characteristics are identified along two dimensions: activities of the health practitioner and activities of patients. For each dimension, we explicate two triggers of social presence (i.e. intimacy and immediacy). Secondly, using the theories of attachment our model theorizes two mechanisms of attachment development of community members that would lead them to adhere to the healthcare advice they receive from the community.

**Influence of community characteristics on attachment**

**Practitioner-driven activities:** As we have defined, a practitioner-driven online community can be identified as a disease-specific patient community built on the purpose of supporting patients to better manage their health. This virtual form of socialization alters the role of patients from external consumers of healthcare services to a community of practice of internal consumers (Winkelman and Choo 2003). With the tacit support of the healthcare provider, patients have a platform to support each other and to receive health management advice. In asynchronous online environments, low immediacy could lead to perceptions of low social presence (Tu 2000). Practitioners’ reciprocity allows interpersonal reciprocal communication between the patient and the health practitioner (e.g. messages, postings on the profile page). It enables patients to establish dyadic ties with practitioners. The extent and the frequency of the communication provoke ‘immediacy’ of the relationship (Mehrabian 1977). Interpersonal communication has been identified as an important determinant in relationships (Ren et al. 2007). Specifically, in patient-physician relationship, adequate communication with the patient has been identified as an integral factor that determines the relationship (Ong et al. 1995). Therefore, when the online community allows increased reciprocal communication with the practitioner, patients are likely to develop stronger affectional bonds with practitioners, thus leading to greater levels of emotional attachment.

**H1a:** The extent of practitioner-patient reciprocity in the online community platform is positively related to patients’ perceived emotional attachment to the practitioner.

Communication is often conceived to have both content and non-content, or relational aspects (Street Jr and Wiemann 1987). Specifically, how a medical practitioner communicates with the patient could be more important than the content itself (Street Jr and Wiemann 1987). The continual exchange of verbal and nonverbal messages influences how parties view each other, their relationship, and themselves within the context of the relationship (Biocca et al. 2003). However, when using virtual means to build relationships, professionals have to overcome the burden of asynchronous communication and the lack of non-verbal cues, which are key determinants in any relationship. Provoking perceptions of proximity, revealing emotions, and the conversation of personally interested topics have been identified as important aspects that reflect intimacy (Argyle 1972) in a social interaction. The extent, to which the online community induces intimacy, would influence patients’ perceptions of social presence (Biocca et al. 2003). In offline contexts, informal discussions with patients have been identified as resulting in more positive attitudes towards the practitioner (Doyle and Ware Jr 1977). Therefore, frequent sharing of patient targeted, health specific content would provide an opportunity for practitioners to reach patients through their interests (e.g. posting a link that discusses healthy breakfast options in a diabetes support group). Prior research has shown that, patients in online communities are highly likely to engage in online discussions, if the postings are specifically targeted to patients (Miller and Tucker 2013). Therefore, when the community website allows practitioners to engage in the community via sharing of patient targeted information, patients are highly likely to develop stronger affectional bonds with practitioners. Thus we hypothesize:
**H1b:** The extent to which the practitioner shares patient targeted information in the community profile is positively related to patients’ perceived emotional attachment to the practitioner.

**Patient-driven activities:** Online communities are largely dependent on commitment and active participation of its members (Ren et al. 2007). Active participation as an investment also denotes reciprocation (McWilliam 2012). People often help others with the expectation that their help will be reciprocated, either by those they have helped or by the group itself (Blau 1964; Emerson 1972). *In-group reciprocity* is the community characteristic that enables patients’ communication at the community level. It enables members to actively engage in discussions at the groups’ profile page. For example, discussion threads on treatments, symptoms or home remedies to self-medicate can be identified as activities under this category. Past research has shown that a dyadic exchange occurs when one’s giving is reciprocated, but if one’s giving is reciprocated by a third party other than the recipient, a generalized exchange towards the group would occur (Faraj and Johnson 2005). Thus, in an interdependent group, if the community platform facilitates members to actively engage at group level reciprocal interactions, it gives members a sense of social presence through evoking *immediacy* at the group level. It has been shown that attachment increases if members have a sense of virtual presence or a subjective feeling of being together with others in a virtual environment (Goonawardene and Tan 2013; Slater 2002). Thus we hypothesize:

**H2a:** Enablement of in-group reciprocity among patients at the group level is positively related to patients’ perceived attachment to the healthcare community as a whole.

Online communities of practice generate value by serving the needs of members through communication and knowledge sharing (Li et al. 2009). However, anecdotal evidence suggests that social media sites lead by professional healthcare providers often discourage members to post healthcare related information (Hinmon 2012). The information quality and the accuracy have been attributed as the most significant concerns for users of health information (Ahmad et al. 2010). Prior research in medicine shows that, health providers believe that online user-generated information often generates patient misinformation, leading to confusion, distress, or an inclination toward detrimental self-diagnosis and self-treatment (Song and Zahedi 2007). Nevertheless, patient-generated content (e.g. sharing a link of a success story or a medical treatment) has been shown to have a significant influence on patients’ perceptions. Extant research shows that patients tend to believe a ‘similar other’ most and establish stronger relationships with them (Ciechanowski et al. 2001; Frable et al. 1998). Therefore, enabling the community members to co-share the content would influence patients’ to establish stronger relational bonds towards the community. Thus we hypothesize:

**H2b:** Enablement of patients’ co-sharing at the community profile page is positively related to patients’ perceived attachment to the healthcare community as a whole.

**Practitioner endorsement on patient activities**

In light of directing patients towards healthy behaviors, the importance of professional contribution in online healthcare communities has been identified in prior research (e.g. Goonawardene and Tan 2013; Thorne and Paterson 2001). In offline health management communities, majority of the research has been directed towards understanding the supportive task of professionals within the interpersonal healthcare network, and addressed the facilitative role of the healthcare professionals in mobilizing or educating members (Keeling et al. 1996; Thorne and Paterson 2001). The active endorsement of practitioners in the community discussions would provide useful verification of the content being generated in the community. It has been revealed that health information seekers tend to look for professionally-generated content over patient-generated content when they need accurate and reliable information (Kuehn 2011). Therefore, practitioner endorsement in patients’ activities (e.g. involving in community discussions and commenting on patient posts in groups’ profile) could ensure the reliability of the patient generated information. Prior research has disclosed that, access to a helpful community with a reliable information base would make externally driven governance unnecessary for patients (Maloney-Krichmar and Preece 2005). Moreover, practitioner engagement in community activities would show the level of ‘involvement’ of the practitioner and display the maternal role of the practitioner in guiding patients, thus influencing patients to be more attached to the community. Therefore we hypothesize:

**H3a:** Patients’ perceived emotional attachment to the practitioner would be higher with practitioner endorsement in the patient-driven activities at the group level.
**H3b**: Patients' perceived attachment to the community would be higher with practitioner endorsement in the patient-driven activities at the group level.

**Influence of attachment on patients’ willingness to adhere to healthcare advice**

When considering patient-centered care, the positive influence of a collaborative patient-provider relationship is particularly important and stands as one of the most important determinants of optimal treatment adherence (Ciechanowski et al. 2004; McLane et al. 1995). Affectional bonds between the patient and the provider has shown to be closely related to patient satisfaction (Bennett et al. 2011), commitment (Barksdale et al. 1997), less turnover and would result in a complete patient medical history (Adler 2002). Further, a more satisfied patient who is more informed will adhere to the physician’s treatment plan (Clark 1991; Donovan and Blake 1992) and would lead to better treatment outcomes (Hinds 1988). Therefore, in online communities, patient attachment to the healthcare practitioner would create an effective channel for practitioners to convey healthcare related advice to the patients. When patients’ perceive stronger emotional attachment with the practitioner, they are likely to comply with the healthcare advice and guidelines offered through the community. Thus we hypothesize:

**H4a**: Patients’ perceived emotional attachment to the practitioner is positively related to patients’ adherence to healthcare advice received online.

When group members are attached to the group purpose as a whole, attachment will work through common identity (Ren et al. 2012; Ren et al. 2007) and cause members to attend to and like the group. Prior research has also indicated that online community members who feel attached to the community through common identity, will be more likely to conform to group norms (Ren et al. 2007; Sassenberg 2002). In healthcare communities, patients often seek support and belongingness among the people who share similar conditions (Lau and Kwok 2009). Extant research shows that patients’ attachment to a supportive network of similar others would lessen their anxiety, resistance to treatments (Johnson and Ambrose 2006) and increase patient coping and well being as a whole (Wortman and Conway 1985). Therefore, when patients actively engage in a supportive online network which they identify themselves as a part of it, they are likely to adhere to the group’s norm, resulting in greater levels of adherence to healthcare advice received through the community. Thus we hypothesize:

**H4b**: Patients’ perceived attachment to the community is positively related to patients’ adherence to healthcare advice received online.

**Research Methodology**

To test the hypotheses, a controlled field experiment will be conducted in a community based online platform affiliated to a leading healthcare group in a Southeast Asian country. The platform facilitates healthcare providers to create online special interest groups based on common illness conditions. The experiment design will include the full factorial design of three key community characteristics (practitioner activities, patient activities and practitioner endorsement on patient activities) each with two levels based on the high/low and availability/non-availability, resulting in $2^3$ number of conditions including the control group. Therefore, eight special interest groups will be created over this platform controlling for the different features and then deployed for use in a health management program.

Study participants will be recruited on a voluntarily basis and will be randomly assigned to treatment conditions. The power analysis yielded a sample size of 240 (240/8) to give a statistical power of 0.8 and a medium effect size ($f = 0.25$; statistical sig. $(\alpha)$ level = 0.05) (Cohen 1988). Therefore, 30 subjects will be recruited for each treatment group. In order to ensure continuous participation, patients who have been diagnosed with a chronic illness condition (e.g. Diabetes type 1) will be recruited. They are suitable subjects for our study, as they need to continuously manage their health. They will be asked to actively participate in the online community (i.e. support group) they were assigned to over a six-month period. As we gain full access to the system, log files for user activities will also be examined to ensure the active participation of members. Non-active members or members who are not continuously active throughout our study period will be removed from our analysis. A survey will be conducted at regular intervals to assess the change in perceptual constructs (i.e. patient’s attachment to the practitioner, attachment to the community and willingness to adhere) over the study period.
The content in the community website will be carefully generated and evaluated by health professionals before sharing with the subjects in different treatment groups. Specifically, the dimension: practitioner-driven activities (i.e. practitioner’s reciprocity and patient-targeted content sharing) will be manipulated by the close guidance of healthcare professionals. The manipulation of this feature will be based on the extent to which the practitioners participate in the community activities (i.e. high and low). Further, ‘patient-driven activities’ and ‘practitioner’s endorsement’ will be manipulated based on the availability and non-availability of the feature. For example, ‘practitioner endorsement’ will be manipulated based on the availability of the practitioner’s comments on the patient-patient discussion threads, and on the availability of patient-shared information on the community profile page.

Survey constructs will be adapted and operationalized based on previously validated instruments. For example, attachment to the community will be adapted from Ren et al. 2012 and emotional attachment to the practitioner will be adopted from the patient-provider relationship questionnaire (Feltz-Cornelis et al. 2004). The dependent variable will be operationalized at two levels. First through a survey, patients’ willingness to adhere to the healthcare advice will be measured. The survey items will be modified based on Davis (1989) and self-reported measures will be gathered to evaluate the extent to which patients are willing to use the health advice they receive through the website. Second, objective data collected from patients’ follow-up visits to the clinic will be gathered to evaluate the extent to which patients’ are actually following the suggested healthcare procedures and to determine the changes of their health condition.

**Control variables:** As the focus of our research is on the manipulation of different features available for patients and practitioners, several factors need to be controlled in order to gain adequate results. First, as we are interested in examining the influence of practitioner-patient reciprocity and practitioner posting of patient targeted content, it is important to control for other aspects of the practitioner and patient communication. For example, the extent of professional medical advice provided to individuals and offline communication. Secondly, since the focus of the study is on a health management community, factors such as illness severity and the age are also need to be controlled among the study subjects.

**Conclusion**

This study provides important theoretical and practical implications for research on healthcare interventions, online healthcare communities, and attachment literature. Firstly, our study contributes to literature by investigating the effectiveness of an online community-based healthcare intervention. Specifically, we examine the actual benefits of a practitioner-driven online healthcare community in patients’ healthcare management. Although previous literature has identified the advantages of professionally driven healthcare communities (e.g. Winkelman and Choo 2003), an empirical study which examines the underlying mechanisms of influence and the actual impact on patients’ has not yet been studied. Secondly, this research advances the literature of attachment by examining the attachment-oriented mechanisms that could exist in an online healthcare community. Attachment theory has been widely applied in offline contexts to explain the doctor-patient relationship. Thus our study extends the boundaries of attachment theory by identifying the possibility of developing practitioner-patient attachment relationship through an online community.

Our study also provides important practical implications for healthcare practitioners and website designers. Our study examines several online community characteristics that are essential to develop patient attachment with the provider. Considering the barriers posed by social media regulatory policies and the limitation of the lack of media-richness as in face-to-face communication, practitioners need to carefully consider the type of activities they have to perform online to gain active engagement of patients and to build attachment in the online community. The current study focuses on the manipulation of features for different treatment groups. Future research will be carried out to come up with more rigorous indicators using objective data of usage to examine the actual impact of different community artifacts. Moreover, individual differences and aspects such as culture could also have an influence on patients’ healthcare decision making. Therefore future research could be carried out to investigate other interesting dimensions that may influence patients’ adoption of online healthcare advice.

**Acknowledgement**

This study is supported by the MOE AcRF grant no. T1 251RES1216 awarded to the second author.
References


