Health 2.0 Enabled Collaborative Healthcare Maintenance

Research-in-Progress

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Abstract

With the popularity of Health 2.0, healthcare social networks have become powerful tools of bringing people with shared health interests together. New web technologies have enabled individuals to get together and collectively conduct healthcare behaviors in virtual environments. Participation in online healthcare networks could potentially help patients to internalize healthy behaviors. In this research we study the influence of online healthcare networks (i.e. social support and network characteristics) on achieving self-regulatory healthcare targets of patients. We obtained and analyzed data based on patient-generated content and user profiles of a popular online healthcare community. This research follows a mixed method approach to analyze the data and our preliminary analysis showed promising results. This study provides several theoretical and practical implications, in the areas of self-regulatory goal setting, healthcare promotion through online communities and social support.

Keywords: Online healthcare networks, Social support, Healthcare goals
Introduction

Health 2.0, a subset of health technologies mirroring the wider Web 2.0 movement, has enabled the integration of concepts such as social networking, collaboration, openness, and participation, in the healthcare workflow and practice (Eysenbach 2008). Most importantly, these recent developments represent a shift in the health information economy (Radley et al. 1994), with far-reaching consequences for patient involvement, as the gravity shifts away from health care providers as the sole custodian of medical data (Eysenbach 2008). With the popularity of Health 2.0, healthcare social networks have become powerful tools of bringing people with shared health interests together to interact. Such social networks leverage and share collective learning and experience of others to help individuals make better decisions related to health conditions.

Standard health social networks are focused mainly on medical conditions, for which cures are sought, although some websites have user communities for healthy living. In recent years, with the increased interest and the popularity of patient-driven healthcare models, social networks are increasingly exploiting possibilities to facilitate this shift in the medical regime. For example: online healthcare networks are progressively implementing additional functionalities such as quantified self-tracking and collaborative filtering (e.g. PatientsLikeMe, CureTogether, DailyStrength) to identify potentially related conditions patients might be experiencing and match patients in similar situations (Swan 2009). These networks support an early shift towards patient-driven health care, as individuals are starting to measure, track, experiment, intervene, treat and research their conditions and symptoms both individually and in collaboration with others (Gimpel et al. 2013; Sjöklint 2014; Swan 2009). As the popularity of collaborative healthcare technologies continues to grow, it is important to quantify the actual benefit to patients who participate and seek support in such collaborative online environments. The importance of patient-control over own health has been identified as an important factor in patients’ wellbeing. Self-monitoring and self-health management is particularly essential for those with chronic health conditions. On this regard, web technologies built on Health 2.0 are widely credited as important sources of patient education and empowerment (Eysenbach 2000). Most importantly, for people who face challenges in developing self-regulation of behaviors that are essential for health management, online community participation may be useful in developing and motivating such behaviors (Deci et al. 1994).

The quality of health is strongly influenced by lifestyle habits. It requires individuals to exercise some measures of control over the state of their health (Bandura 2005). Individuals are the key locus in development and maintenance of healthy habits. Therefore, the factors that serve as guides or motives are unlikely to make lasting behavioral changes unless individuals develop means to exercise control over their motivation and health related behaviors (Bandura 2005). On this regard, personal goal setting has been identified as an effective strategy to improve healthcare quality, to change health behaviors and to increase the effectiveness of self-health management (DeWalt et al. 2009; Shilts et al. 2004). For example: in weight management, setting specific goals provide a potential strategy for organizing nutrition and physical activity in formation and skills into practical and manageable steps (Shilts et al. 2004). Therefore, participation in online healthcare networks is potentially useful for patients to internalize healthy behaviors. First, online healthcare networks are increasingly providing features to monitor healthcare behaviors. Second, it enables users to communicate and learn from similar others. Through encouraging and supporting each other, the community participation could promote better healthcare behaviors. To date, limited research has been done to understand the influence of online communities on members’ self-regulatory healthcare behaviors (e.g. Eysenbach et al. 2004). In this research we attempt to study the actual effect of online healthcare networks on achieving individuals’ healthcare targets, by addressing the research question, “How could online healthcare networks help individuals to set and achieve health management goals in developing self-regulated health behaviors?” To answer the aforementioned research question, we obtained and analyzed data based on patient-generated content and user profiles of a popular online healthcare community.
Theoretical background and hypotheses

**Self-regulated healthcare targets**

Self-health management is an important concept which holds that patients accept responsibility to manage their own conditions and are encouraged to solve their own problems with information, but not instructions from professionals. The healthcare paradigm views intrinsic motivation as more effective for lifestyle change than external motivation (e.g. making changes to please the physician) (Anderson et al. 2002; Arnold et al. 1995). However, patients are not intrinsically motivated to self-regulate uninteresting, though important health-related behaviors. Past research shows that, setting achievable personal targets could alleviate this issue by guiding and motivating individuals to work towards achieving their goals thus internalizing better health practices (Schunk 1995). Therefore, in recent years research efforts have been taken to promote internalization of healthy behaviors (Bellg 2003), through healthcare goal setting.

The goal setting research in organizational settings has been proliferating over the past half-century. However it is only during late 90s that healthcare educators have begun to systematically test its effects in community health promotion interventions (Shilts et al. 2004). Since then, topics such as self-regulation in health, collaborative healthcare decision-making, and participatory goal setting in primary care are becoming popular among healthcare researches. According to our literature review, a majority of studies have looked into collaborative or assigned healthcare goals of patients. Little research has been done in identifying the nature of self-set healthcare goals.

Health behavior change goals are not central life goals, and they often conflict with other life goals (Bodenheimer and Handley 2009). Therefore motivation to reach those goals may be of a weak and vacillating nature. A central concept in self-health management is self-efficacy—confidence to carry out a behavior necessary to reach a desired goal. Self-efficacy is enhanced when patients succeed in solving patient-identified problems (Bodenheimer et al. 2002). Self-efficacy theory argues that, not only personal achievement, but the vicarious experience (other people’s performances) could also enhance one’s self-efficacy (Bandura 1977). Online healthcare communities could potentially help individuals to internalize healthy behaviors. First, it provides an easy and a convenient platform for patients to set and monitor healthcare targets with the support of others. Second, through online communities patients are able to establish a greater number of connections with similar others and learn from experiences of others. Therefore with the tacit support of similar others, the participation in online support communities could provide an effective mean to motivate individuals to set goals and to work towards achieving them. However, still there is a lack of understanding of the nature of personal healthcare goals that are maintained in online environments and how online communities could influence individuals to achieve them. Online community based platforms are increasingly paying attention to implement features for its users to quantify healthcare behaviors. Although this new shift in online healthcare is becoming increasingly popular among practitioners, it is not clear the extent to which these self-set, self-monitored healthcare targets are actually contributing towards the success. Therefore, in this research we attempt to address this gap by focusing on goals created in an online weight management community.

**Social support in online social networks**

Social networks give rise to various social functions, for example: social influence, social comparison, social support etc. (Heaney and Israel 2008). Social influence exerts through simple observation of behavior of others (Bandura and Cervone 1986) or from receiver-initiated social comparison processes (Wood 1996). Whereas, social support is always intended, helpful and consciously provided (Heaney and Israel 2008). Therefore, it stands out from other means of social functions and is one of the most important functions of social relationships. Extant literature addresses the positive relationship between social support and health (Heaney and Israel 2008; Sanders and Suls 1982). Through interpersonal exchanges occurring within a social network, individuals can be influenced and supported with their health behaviors. For example: adherence to medical regimens, help seeking, smoking or alcohol cessation, and wellness-management are some of the broadly studied behaviors.

Based on the categorization of House (1981), social support can be categorized into four broad themes: informational support, emotional support, appraisal support and instrumental support. Emotional support involves the provision of empathy, love, trust, and caring. Cohen and Wills (1985) defined
emotional support as expressions of concern, compassion, sympathy, and esteem for another individual. In other words, it is the provision of comfort by sending a signal that one is not alone, is taken care of and valued. Emotionally supportive messages are those that effectively communicate caring regardless of the outcome (Weber and Patterson 1996). In contrast to the emotional support, other three types (i.e. informational, appraisal and instrumental) of support are goal oriented or outcome based (Weber and Patterson 1996). In such, the support is provided with the aim of moving the receiving person towards achieving receiver’s desired goals. Appraisal support involves the provision of information that is useful for self-evaluation purposes, in other words, constructive feedback and affirmation (House 1981). Informational support is the provision of advice, suggestions, and information that a person can use to address problems (House 1981). Instrumental support involves the provision of tangible aid and services that would directly assist a person in need (House 1981). Towards this end, as the focus of this study is on online healthcare communities, the instrumental support is less prominent. Thus, in our study we mainly focus on emotional, appraisal and informational support mechanisms in online communities.

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). With the advancement of web technologies, online communities have become effective tools of interconnecting people and providing emotional and informational support (Eysenbach et al. 2004). Online community-based platforms provide a range of features for users to exchange support. For example, one can convey emotional support to another by commenting on user profiles, through private messages or even by using emoticons or stickers to show concern. Further, online social networking features, such as friending and sharing of personal stories, are helpful in satisfying members emotional support needs (Chung 2014). Online communities facilitate increased interactions with others and enable the provision of shared and tailored information from a wide audience (Moorhead et al. 2013). Therefore, such communities also enable efficient exchange of information support between members. Exchange of social support and participation in online communities can be particularly helpful for patients with lower activation in managing their health conditions (Magnezi et al. 2014).

Past literature identifies two pathways, where social support influences physical health outcomes. First pathway involves behavioral processes as outlined by social control and social identity theories (Uchino 2006). For example, the influence of social support in improving health behaviors and adherence to medical regimens (Lewis and Rook 1999; Umberson 1987). According to this view, social support is health-promoting because it facilitates healthy behaviors such as exercise, eating right, not smoking and promote greater adherence to medical regimens (Review of Uchino 2006). The second pathway stated by Uchino (2006) involves psychological processes that are linked to appraisals, emotions or moods (e.g. depression), and feelings of control (e.g. Cohen 1988; Lin 1986). Through elevating psychological wellbeing, social support is shown to improve healthcare outcomes of patients. Therefore, we hypothesize the functional support mechanisms in an online healthcare community:

**H1a:** Emotional support received in an online healthcare community has a positive effect on receiver's healthcare goal achievement.

**H1b:** Appraisal support received in an online healthcare community has a positive effect on receiver's healthcare goal achievement.

**H1c:** Informational support received in an online healthcare community has a positive effect on receiver's healthcare goal achievement.

**Network dynamics**

Past research and anecdotal evidence show that involvement in social relationships benefits health. Social networks refer to the web of social relationships surrounding an individual, in particular, structural features, such as the type and strength of each social relationship (Umberson and Montez 2010). Patients join online networks to communicate with other patients and to gain useful information to better understand their health issues. In this study, we draw upon social network literature to derive important characteristics of the patient’s embedded social network to better understand the influence mechanisms exist in online social networks. Specifically, we focus on similarity and tie strength of the social network.

Strong ties refer to relationships associated with frequent contact, deep feelings of affection and obligation, whereas weak ties refer to relationships with infrequent contact, superficial and easily broken
bonds (Kraut et al. 1998). Tie strength is defined as a “combination of the amount of time, the emotional intensity, the intimacy and reciprocal services which characterize the tie” (Granovetter 1973). Based on Granovetter’s tie strength argument (1973), many important claims have been made on a range of topics: innovation, marketing, social groups to formal organizations, health care systems to drug users etc. (Petróczi et al. 2007). Particularly in healthcare research, social integration is found to be associated with better health outcomes. Further, the quality of existing ties has been found to influence the extent of such health benefits (Seeman 1996). Individuals in a strong tie relationship tend to interact more frequently and exchange more information, compared to those in a weak tie relationship (Brown and Reingen 1987). Therefore, connectivity to a higher number of stronger ties would increase the chances of receiving more social support from the community. Further, supportive messages exchanged via strong ties could have a higher effect on the receiver, because of receiver’s strong emotional connection with the sender. Therefore, we hypothesize the interaction effect:

**H3a:** Tie strength moderates the relationship between social support (emotional, appraisal, informational) and healthcare goal achievement; such that the effect is stronger when patients receive support from stronger ties, than when patients receive support from weaker ties.

In social network research, network diversity has been studied as an important factor that enables individuals to learn from each other and offer access to diverse pools of knowledge (Fleming et al. 2007; Fliaster and Schloderer 2010). However, in this research we argue that, in healthcare communities, patients often benefit when they are connected to similar others than to a diverse network. 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). Further, past research has identified vicarious experience as an important source where patients gain self-efficacy to manage their health issues (e.g., Gifford 1999). It is beneficial for an individual to observe someone perceived to be similar, successfully performing healthcare related tasks. Therefore, we argue that, receiving supportive healthcare related messages from patients who have similar health concerns is likely to elevate the self-efficacy of patients and thereby facilitate them to better achieve healthcare related goals. Thus, we hypothesize the moderating effect:

**H3b:** Network similarity moderates the relationship between social support (emotional, appraisal, informational) and healthcare goal achievement; such that influence of the social support is stronger when patients are connected to more similar others.

**Direct effect of social network characteristics**

In online healthcare communities, patients get exposed to a wide range of information generated by both professionals and non-professionals. The influence in such communities could come in two forms: direct provision of support (e.g. providing guidance to a particular person in need) (Antonucci and Jackson 1990) and passive exposure to the information (e.g. information received through member profiles or blogs) (McMullan 2006). In spite of the receiving mechanism, information in online communities could simplifies medical interpretation and fosters a better understanding of patients’ conditions and assist healthcare related decisions (McMullan 2006). When patients are connected through stronger ties, they are likely to expose and learn through experiences and knowledge of others (for example: best practices of close friends when managing health issues or identifying practices which need to be avoided). It is being argued that individuals who are part of an active social network are less negatively affected by stressful life problems and also possess higher levels of coping and recovery (Sanders and Suls 1982).

Past research shows that sharing an attribute would produce some baseline interpersonal attraction and homophily (Reagans 2005) in social networks. It is also shown that when patients are with others who share comparable experiences and face similar challenges they experience lesser anxiety and resistance towards their treatments (Johnson and Ambrose 2006). The process of social influence leads people to adopt behaviors exhibited by those they interact with. The relationship between similarity and social influence has been shown in existing studies (Crandall et al. 2008). Therefore, embeddedness in a network with similar patients who strive to achieve similar healthcare targets could influence healthcare behaviors by encouraging and empowering individuals. Therefore we hypothesize:

**H4a:** Social network similarity positively influences patients’ healthcare goal achievement.

**H4b:** Tie strength positively influences patients’ healthcare goal achievement.
Research model is presented in Figure 1. It depicts the hypothesized relationships between social support, social network characteristics and health care goal achievement of patients. In order to measure the actual influence of social support, certain factors need to be controlled within this research. For example, goal setting characteristics such as: goal difficulty, goal duration and health concerns that could hinder successful goal progression.

**Research methodology**

**Data collection**

Data was gathered from a popular health 2.0 website. It is a popular social networking website centered on healthcare support groups, where users could meet and establish online connections with others who have similar healthcare concerns. The website facilitates users to exchange social support with each other by providing a platform to discuss their life struggles, health issues or success stories. The platform has created support groups covering a vast range of health, wellness and life issues. This platform allows users to participate in special interest groups based on their health issues. Further, it has provided necessary features for its members to create and monitor healthcare goals. These goals come with measurements and tracking tools to keep them focused, and harnesses the power of online support groups to keep them on the right path.

For our investigation, we have chosen the ‘Obesity’ Support Group. This support group has over 6000 members and over 2000 goals are pursued. Weight management requires a substantial amount of self-health management, including life-style modifications and self-monitoring. Therefore, such patients possess the required level of motivation to set goals and continue to work towards achieving them. Individually created, 708 completed or given-up goals of 627 members were chosen for our analysis. Publicly available information such as: profile information, friend network, discussion threads, subscribed support groups, goal descriptions, updates, self-reported progress levels, comments, and goal end dates of patients were extracted for our investigation. Firstly, goals were refined based on the relevancy for a ‘Weight Loss’ task. For example, goals such as ‘Quit binge drinking’ or ‘Build my self-esteem’ were removed from our dataset. Secondly, further refinements were done based on the user-generated descriptions and the precision of goal progress updates. For example, we removed goals if a large proportion of updates are irrelevant to the weight loss task specified at the beginning or if the user reported goal progress is not a true reflection of the actual weight loss.

**Research approach**

This research uses a mixed method approach (Johnson et al. 2007) to analyze the data. At the first stage, we conducted a qualitative content analysis to better understand the nature of the goals and goal progressions. The coding of 708 goals was carried out by four researchers to extract important themes and variables. Inter-coder reliability was checked afterwards. Our research design represents a more deductive approach than an inductive approach of category development (Mayring 2003), the category definitions
and rules for distinguishing categories were formulated with respect to the theory and existing literature. The categories were revised and new categories were added step by step. At the second stage, quantitative analysis techniques will be used to test the proposed hypotheses. Measures of each proposed variable is discussed in detail in the following section.

**Data description and measures**

**Social support:** According to the social support theory, the existence of a supportive network in a healthcare context implies that an individual is being encouraged by the social context to take preventive health actions or to seek needed medical treatments (Minkler 1981). From our data, we identified evidence for three types of social support (informational, appraisal and emotional), consistent to the literature. Two mechanisms of social support exchanges are noticeable in this community: 1) support received for a specific healthcare goal 2) support received in general for a specific health condition. The coding scheme was developed based on the definitions of House (1981), and measures were extracted from discussion threads. Support received for a specific goal was coded manually based on the categorization of Table 1 and the general support will be measured using text mining based on the same criteria. Patients tend to provide multiple pieces of information in each post, thus it is improper to classify a post into a single category (Yan and Tan 2014). Therefore we will be measuring the proportion of each support type embedded in each post.

<table>
<thead>
<tr>
<th>Support type</th>
<th>Subcategories of social support</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional</td>
<td>Understanding, empathy, love, sympathy, exchanges of caring and concern</td>
<td>(Barrera and Ainlay 1983; House 1981)</td>
</tr>
<tr>
<td>Appraisal</td>
<td>Feedback on achievement, communications of expectations, evaluations</td>
<td>(House 1981; Malecki and Demaray 2003; Mitchell and Trickett 1980)</td>
</tr>
<tr>
<td>Informational</td>
<td>Advice, referrals, Task-oriented support, Behavioral guidance</td>
<td>(Barrera and Ainlay 1983; House 1981)</td>
</tr>
</tbody>
</table>

**Tie strength:** Strength of a relationship is commonly measured using tie-related factors that include duration, communication frequency, and emotional closeness (Granovetter 1973; Marsden and Campbell 1984). In most of the network literature, tie strength was measured based on the latter two indicators (e.g. Hansen 1999; Sosa 2011). In this study we use communication frequency (reciprocated communication) to measure tie strength. Specifically, it is measured based on the frequency of interpersonal exchanges (e.g. discussions, postings). Emotional closeness is the level of emotional affect associated with the interaction. As we use objective measures, lack of emotional closeness data is a limitation of this study.

**Similarity:** The similarity of the friendship network is measured at three levels (i.e. sub categories). 1) The highest level of similarity is exerted when individuals have similar goals with similar health issues; 2) patients sharing similar health issues; 3) no mutual health concern. The proportion of friends of each type to one’s entire friend network is calculated to estimate the similarity of patient’s connected network.

**Self-regulated goals achievement:** Goal achievement is measured based on the patient reported percentage of the goal achievement. Reliability of this percentage is assessed at the data cleaning stage and goals with achievement inconsistencies are removed from our dataset. Our initial analysis showed that, a higher number of goals has ended having achieved below 50% of the targeted weight loss. 110 goals achieved a progress between 50% - 90% and 40 goals have successfully achieved 100% of the target. Prior to the main analysis, we first conducted an initial analysis to understand the nature of the support given to specific goals. Results of the initial analysis show that on average a user has updated 4 times (min=1; max=15; SD=3.03) during the goal progression period and each update has received 1.15 number of direct comments (min=0; max=14; SD=1.85). On average a user has received 5 comments (min= 0; max=57; SD =8.19) as support from the community for a goal.

**Control variables:** As the focus of our research is to understand the influence of social support and the patient’s embedded social network on healthcare goal achievement, several factors need to be controlled in-order to gain adequate results. Firstly, the starting weights of the patients were all between the range of
149lbs and 639lbs. The majority of the patients have started their weight loss goal with an initial weight between 150lbs to 400lbs. Secondly, in order to capture the variations of goals; goal setting characteristics were assessed based on the goal’s difficulty and specificity. Each goal is coded into three levels of difficulty and three levels of specificity based on the definitions derived from the goal setting theory (Locke and Latham 1990). Finally, we also captured other reported health issues of patients.

Discussion

Health 2.0 technologies have opened up new opportunities for quantifying, monitoring and managing healthcare behaviors. These new web technologies have enabled individuals to collectively conduct healthcare behaviors while supporting each other. Our initial qualitative analysis of goals and social support showed promising results for further analysis. In terms of the direct support received, appraisal support and emotional support are the most exchanged type of support. We found a strong positive correlation between the social support (i.e. emotional, and appraisal) and the final goal achievement. Direct information support is less prevalent in the community. Interestingly, direct information support related to goals has often exchanged among members upon request and given from personal experience. One possible reason for this observation would be the nature of the goal. Weight management requires less expert advice when compared to management of chronic health conditions. Following table illustrates examples for each type of support:

<table>
<thead>
<tr>
<th>Support type</th>
<th>Example patient generated content from the community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informational</td>
<td>“Hi You are doing really well. I have been eating 500 calories on just two days a week and a normal amount for the other 5. I find it is working very well for me”</td>
</tr>
<tr>
<td>Emotional</td>
<td>“Don’t get discouraged. I lost 10 then gained 3 so I feel for yah. I too struggle to lose. Good Luck.”</td>
</tr>
<tr>
<td>Appraisal</td>
<td>“15%. You are an inspiration!” “You can do it, much hugs.”</td>
</tr>
</tbody>
</table>

Further, we observed a differential influence from different types of social support. For example: more appraisal support tends to receive when goals are progressing well and emotional support when there is a downfall. Past research has shown a reciprocal relationship between the type of support and its correlates. For example: information support received is found to be related to individuals’ coping. Inversely, coping behavior could also provide interpersonal cues regarding what is needed in a stressful situation and the members of the social environment would respond accordingly (Dunkel-Schetter et al. 1987). Further, Yan and Tan (2014) found that influence of social support could also vary depending on patients’ health conditions. Different types of support could influence patients’ in different ways depending on the circumstance. Based on our qualitative analysis, in-order to guide patients towards achieving self-set, self-monitored healthcare targets, provision of social support throughout the goal’s life span is essential. However, the impact of the social support received and the type of social support required could vary depending on situational and contextual factors and requires further research.

Future work

Our preliminary analysis showed promising results to establish the understanding on influence mechanisms of different types of social support in patients’ healthcare goal achievement. Future research will be carried out to statistically validate the proposed research model and to identify the moderating role of the network dynamics.

Interestingly, we observed several goal progression patterns in our data set. For example: Figure 2a, depicts goal progressions of two patients (axis x: date, axis y: achieved percentage). Apart from these two patterns, our analysis found four additional progression patterns: zig-zag progression, rapid progress towards the end, declining trend and constant (with no progress). Further examination of these observed trends showed a positive correlation between the social support received and the progression pattern achieved. Figure 2b: shows the mean progression of 100% completed goals divided into two categories
Collaborative Healthcare Maintenance

Therefore, future research will be carried out to extend our research to identify different progression patterns and to examine the influence of the online social network (i.e. network characteristics and social support) in determining ones’ goal progression.

The main limitation of this study is the individuals’ partially observed healthcare behavior. Other than the observed variables and correlations, there could be other factors hindering patients’ successful goal progression. For example: physical or psychological status and other life struggles, which are not updated in the online community, could affect individuals’ commitment towards the goal. Therefore, our observed goal progression is highly contingent upon self-reporting. One possible method to minimize this bias would be to conduct interview or survey. Therefore, future research could use a combination of subjective and objective measures to evaluate the model.

Conclusion

This study provides several theoretical implications in the areas of self-regulatory goal setting, healthcare promotion and social support literature. Firstly, our research contributes to the literature on online healthcare communities by identifying its potential to guide patients towards achieving self-regulated healthcare goals. This research is one of the first attempts to study the positive influence of online communities (i.e. social network dynamics and social support) on achieving self-regulated healthcare goals. The past research shows that social relationships may provide social control of health behaviors indirectly by affecting the internalization of norms for healthy behaviors, and directly by providing informal supports for deviating from behavior conducive to health (Umberson 1987). Therefore, the presence of a supportive community could effectively guide, direct and encourage each other to maintain behaviors essential for their lives. Secondly, healthcare literature identifies goal setting as an effective strategy of promoting healthy behaviors (e.g. Bandura 2004; Liss 2000; Shilts et al. 2004). However, existing healthcare literature has mainly focused on the practitioner driven healthcare goal setting (e.g. Shilts et al. 2004) and practitioner guided goal achievement (e.g. Alexy 1985; Schultz 1993). Therefore, our research contributes to the healthcare literature by theorizing the dynamics of self-regulated healthcare behaviors. Thirdly, our study identifies the influence of three types of online social support on healthcare goal achievement. Successful completion of this study will contribute to the social support literature by quantifying the influence of social support on online healthcare consumers.

Our research also provides important practical implications for healthcare practitioners and online community moderators. As our research identifies the role of network dynamics and social support, findings of our research could potentially provide valuable guidelines to design effective healthcare management programs in online environments. For online community moderators, our study provides practical suggestions on the type of content and the type of exchanges that should be promoted in an online community to increase the positive effect on members.

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