

Self-determination theory in explaining social media effects

Self-determination theory as an explaining mechanism for the effects of patient's social media use

Research-in-Progress

Edin Smailhodzic

University of Groningen
Groningen, The Netherlands
e.smailhodzic@rug.nl

Sterre Attema

University of Groningen
Groningen, The Netherlands
s.m.attema@student.rug.nl

Abstract

Social media enable patients to communicate with a large number of their peers, share experiences, and provide each other with emotional and informational support. Hence, patients can extend their traditional sources of information and build knowledge online with other patients. While limited research presents us with anecdotal evidence or make propositions of the social media effects, current research has not provided a theoretical explanation or empirically tested how social media changes doctor-patient interactions. We draw on self-determination theory to hypothesize the effects of social media use on doctor-patient interactions, namely self-management, empowerment and shared decision making. We propose the explanatory mechanism of self-determination theory through its key concepts of competence, autonomy and relatedness. We employ longitudinal survey in a newly established social media platform for diabetes patients to test our hypotheses.

Keywords: Social media, health, doctor-patient interactions, diabetes

Introduction

The healthcare consultation process between doctor and patient is considered to be a cornerstone of medical practice. It represents a formalized process of interaction in which the patient seeks advice from the doctor and the doctor attempts to provide a solution to the patient's problem. A classic model of the consultation process by Pendleton (1984) describes tasks such as defining the reason for the visit, addressing other issues, achieving shared understanding of the problem and choosing the appropriate action. This process has been traditionally characterized by face-to-face interactions between doctor and patient as the primary way to exchange information (Street 1991). However, this doctor-patient consultation is often time insufficient for the patients to get all their questions answered (Kuehn 2011). Furthermore, for many years other alternative sources of information for the patients such as, for example, books and other patients, were not easily accessible due to travel and mobility restrictions and outdated materials (Broom 2005). Thus, doctors were the major source of information for patients (Hellawell et al. 2000).

The emergence of the Internet has brought about change and patients now also turn to online sources to look for health related information. For example, a recent *Pew Research* study shows that 72% of the Internet users in the USA searched for health information online in 2012 (Fox and Duggan 2013). They looked for information on conditions, doctors, treatments, procedures and ways to communicate with other patients. Many of those who search for health information online turn to social media. Social media in particular enable patients to communicate with each other and share health advice and information. Social media have indeed proliferated in the healthcare domain (Kane et al. 2009). It allows patients to move from one-to-one and one-to many to many-to-many communication (Hawn 2009). In this way, patients can connect with their peers and feel supported (Lau and Kwok 2009; Ziebland and Wyke 2012). Hence, patients extend their traditional sources of information and interactions with friends and fellow patients (Rains 2007). However, with social media, patients go further to exchange health advice and build their knowledge (Antheunis et al. 2013).

When patients extend their process of communication via social media to include some of the aspects that are traditionally part of the face-to-face doctor-patient interactions, this may have effects on this process (White and Horvitz 2009). As a consequence, patients are less dependent on the information that they obtain from their doctors (Rupert et al. 2014). These developments have been linked to mostly beneficial outcomes regarding health (Hamm et al. 2013). On the one hand, patients who receive more social support, which can be found on social media are more satisfied with the healthcare they receive and they may feel empowered (Da Costa et al. 1999; Househ et al. 2014). On the other hand, Agarwal et al. (2010) suggest that the use of online information may lead to tensions with their doctors if patients find online information more credible than information provided by their doctors. However, current research mostly focuses on the type of use by patients or make propositions about patients outcomes and their interactions with the doctors (Antheunis et al. 2013). Thus, there is a lack a theoretically driven explanation and empirical tests on social media effects on doctor-patient interactions. This indicates a need for deeper understanding of the impact of social media in healthcare and Information Systems (IS) scholars call for the research on this topic (Agarwal et al. 2010; Fichman et al. 2011). To address this gap and respond to the calls, we draw on self-determination theory (SDT) and propose a conducting a longitudinal survey in a newly established social media platform.

Hence, the aim of this paper is to explore the effects of social media based patient-to-patient communications on doctor-patient interactions. In particular, we focus on three concepts, namely self-management as a complement to doctor-patient interactions as well as empowerment and shared decision making as they concern doctor-patient interactions. We focus on these three concepts as they represent one of the most important aspects of doctor-patient interactions in the primary care (Stiggelbout et al. 2012). We aim to contribute to health information technology by focusing on social media and related effects (Agarwal et al. 2010; Fichman et al. 2011). Furthermore, we study this from the patient's perspective whereas most studies in the health information technology are concerned with doctor's perspective (Agarwal et al. 2010).

This paper also has practical implications for doctors and policy makers. Doctors can better understand how social media utilization by patients may impact upon patient healthcare provision process, and they can adapt to better address patients' changing needs and demands. Moreover, they can gain insights into

how they may become involved in this virtualized process on social media. Healthcare policy makers may use findings from this study to reconsider measures promoting social media utilization and to understand the future role of doctors in social media patient communities.

Theoretical background

Social media in healthcare

We define social media as Internet-based applications built on technological and ideological foundations of Web 2.0, which enable the creation and exchange of user generated content (Kaplan and Haenlein 2010). Typical social media include blogs, microblogs, social networking sites, wikis and video or content sharing sites. Since their emergence, social media have become very popular and have changed the ways in which we communicate (Aral et al. 2013). Social media are specific in the sense that they represent end user-driven technologies. Such technologies follow bottom-up rather than top-down approach in the use and adoption of technology (Boudreau and Robey 2005). As such, social media initiatives follow the bottom-up approach. With such technology, patients can easily post and receive content as well as make connections with each other. The specificity of social media in regards to other technologies is also reflected through the social media affordances concept (Treem and Leonardi 2012). They propose that social media communication is characterized by visibility, editability, persistence, and association. These principles also apply to social media health communities where patients can make their knowledge and communication visible to others (visibility), they can edit and build on each other's content (editability), their communication remains accessible even when they are not present (persistence) and they create connections between each other or with the content (associations). These distinct characteristics of social media explain how patients can easily and openly share information and are different than earlier technologies that were based on Web 1.0. For example, earlier studies discussed the patient's use of medical information on the Internet and other technologies (Feenberg et al. 1996; Josefsson and Hanseth, 2000;).

Patients traditionally have relied on doctors for informational support and to some extent for emotional support, and this has been linked to outcomes such as higher reported health-related quality of life and higher self-efficacy (Arora et al. 2007). However, social media have now gained an important role within the healthcare (Antheunis et al. 2013). Therefore, we argue that social media can be used to provide patients with similar support. The last couple of years have indeed shown an increase in the research on health related social media. Social media is used by doctors and patients (Moorhead et al. 2013). It covers various themes such as the features of social networking sites (Greene et al. 2011) and health groups (Bender et al. 2012). Research indicates that the use of social media by patients has affected the healthcare sector (von Muhlen and Ohno-Machado 2012). For instance, social media has created an online discussion place for patients, which goes beyond the reach of doctors (Modahl et al. 2011). Moreover, recent research showed that the use of social media by patients has created some essential changes for patients themselves (Antheunis et al. 2013). Social media has changed the way in which people access, create, and use information or services and it enables patients to get in contact with other patients who share the same interests and goals (Gómez-Zúñiga 2012). In summary, patients often use social networking sites for social support, increasing knowledge and exchanging advice (Antheunis et al. 2013).

The prevalent concept of patient's use of social media is social support. It refers to "an individual's experiences of being cared for, being responded to, and being helped by people in that individual's social group" (Liang et al. 2011). The concept is generally used as referring to a broader category of support, including informational, emotional and tangible support. This definition of social support thus encompasses the concept of emotional support as it also increases knowledge and exchanging advice' that were mentioned by Antheunis et al. (2013). Informational and emotional support are the most relevant in an online context as they can be easily provided online, while tangible support such as lending or giving someone goods or money is more difficult online (Liang et al. 2011). The concept of informational support in an social media health community refers to the following: "providing messages, in the form of recommendations, advice, or knowledge that could be helpful for solving problems", whereas emotional support refers to "providing messages that involve emotional concerns such as caring, understanding, or

empathy” (ibid). In short, the social support dimensions of informational and emotional support can be found online, and people use social media when they seek these kinds of support with regards to their health.

Social media are found to have the potential to increase empowerment, as it provides individuals with the informational support that they need in order to take care of themselves, to explore options with regards to their disease and to share and discuss their experiences in an easy way (Househ et al. 2014). Individuals can take on a less dependent role vis-à-vis their doctors and develop their own perspective on their disease based on different sources. This allows individuals to approach their disease in a more active and meaningful way making them feel more empowered (ibid). Through the provision of social support and the sharing of experiences by others, patients can act upon this information and develop their skills and thus become more able to self-manage their disease (Roblin 2011). For example, the online social network PatientsLikeMe for example has been shown to have this potential (Frost and Massagli 2008).

In addition to the patient’s use of social media, the research highlights the doctor-patient relationship as an important facet in the healthcare sector, since it determines the quality of care (Broom 2005). This quality of care may be influenced by social media as it could affect patient’s behaviour and subsequently doctor-patient interactions. The traditional doctor-patient relationship has been characterized as a long-term relationship, which involved multiple face-to-face visits by patients (Colineau and Paris 2010). The intrinsic quality of this relationship allows that two people, who are unknown to each other before the consultation, feel at ease with a diverse degree of intimacy (Kaba and Sooriakumaran 2007). Although this relationship is long-term and highly based on trust, recent research showed that the use of social media by patients has challenged this traditional doctor-patient relationship (Colineau and Paris 2010).

Broom (2005) showed that this challenge occurred because the use of social media by patients deteriorated the power imbalances between doctor and patients. The power imbalance between doctors and patients is deteriorated due to the increased knowledge and awareness of patients regarding medical information during consultations (Van Uden-Kraan et al. 2010). Hence, patients do not instantly believe or agree what doctors tell or advise them and therefore the power of doctors has decreased (McMullan 2006). More precisely, doctors have encountered that, during consultations, patients use their retrieved medical information (van Uden-Kraan et al. 2010). Yet, their attitude towards this increased awareness of patients are mixed. Some doctors show a positive attitude towards the use of social media of their patients. One reason for this positive attitude could be that it enables patients to cope better with the information provided by the doctors (Potts and Wyatt 2002). Secondly, the use of social media by patients creates more informed and engaged patients (Rupert et al. 2014). On the contrary, other doctors showed a more conservative attitude towards the use of social media by patients. For instance, van Uden-Kraan et al. (2010) indicated that many doctors felt that their authority was challenged as patients tested their knowledge or because some patients diagnose themselves and made their own treatment plan. Patients gather information online before attending an appointment with their doctor and sometimes share this information during the appointment (Rupert et al. 2014). Accordingly, many doctors felt unaware of the social media activities by patients, perceive these patients as misinformed and anxious, find it challenging to evaluate the credibility of the online content, and fear that patients may act on online recommendations without asking their doctor for information (ibid). As the patients become more knowledgeable about their disease, this may lead to more in-depth discussions and in turn can facilitate shared-decision making, which is seen as one of the main characteristics of patient-centred care (Lober and Flowers 2011). Lastly, patients have been found to be more satisfied with their doctors when they have received higher social support, not necessarily from the doctor (Da Costa et al. 1999).

However, limited empirical research and anecdotal evidence do not provide a full explanation of doctor-patient relationship changes due to social media. To study this, we draw on the self-determination theory, which we elaborate on in the next section.

Self-determination theory (SDT) and hypothesis development

As described in the previous section, several studies found that the use of social media for health related purposes can have a range of effects on patients’ outcomes, however the mechanism through which these outcomes come about remains largely unexplained. The current research leverages the theory of self-

determination to explain the outcomes of social media use (Deci and Ryan 2000; Ryan and Deci 2002). SDT addresses basic human psychological needs while uniting both an organismic and a dialectical perspective. Consequently, SDT acknowledges the importance of human agency and intentionality, as well as conditioned responses toward the social-environmental conditions. Explaining human behaviour therefore is done through looking at both personal characteristics and the environment. The three basic needs identified by Ryan and Deci (2002) are the need for competence, relatedness and autonomy. The fulfilment of these needs is in part dependent on the social environment one engages with, and they help in predicting outcomes related to personality development, and quality of behaviour and experiences. Another important assumption of SDT is that “living things have needs that must be fulfilled if they are to persist and thrive” (ibid). This implies that the basic needs are essential to life outcomes. The attainment of these needs however might not always be conscious or explicit for people. However, it is assumed that situations that can satisfy these needs are preferred over situations that do not satisfy or even impede the fulfilment of these needs.

SDT has the potential of explaining healthcare-related outcomes (Ng 2015). Many health-related outcomes heavily depend on an individuals’ motivation to engage in the necessary health-related behaviours (e.g. physical activity, taking medicines and following a diet). SDT helps explaining whether an individual will internalize and integrate the necessary health-related behaviours, and ultimately whether a person will be motivated to engage in the behaviours (Ryan et al. 2008). Ryan and Deci (2002) use the following definitions of the three basic needs. Firstly, competence is defined as: “feeling effective in one’s on going interactions with the social environment and experiencing opportunities to exercise and express one’s capacities” (Ryan and Deci 2002). Consequently, in relation to health-related behaviours this would mean that a person feels effective in engaging in health-related behaviours and interacting with the social environment about the disease, and has the possibility to act on his or her capabilities concerning health-related behaviours. Secondly, relatedness is defined as: “feeling connected to others, to caring for and being cared for by those others, to having a sense of belongingness both with other individuals and with one’s community” (ibid). This need drives people to connect with others and feel that they belong somewhere, irrespective of other goals related to obtaining a certain status or other outcomes. With regards to health, it would mean that people feel connected to others that are dealing with the same health issues. Lastly, autonomy is defined as: “being the perceived origin or source of one’s own behaviour” (ibid). In relation to health, this need drives people to behave in a way that makes them feel like they have initiated and chosen the health-related behaviour.

Hypotheses development

The extent to which patients use social media as a source of informational support is expected to be positively related to autonomy. Autonomy can be supported by providing someone with relevant information, listening to someone, minimizing control, and encouraging someone to ask questions, to express opinions, and to choose between treatments (Williams and Deci 2001). These behaviours are likely to be supported in social media health communities that are targeted at patients, as the aim is often to inform patients, let them share experiences, support each other and learn from each other (Antheunis et al. 2013). Moreover, this social media based communication is likely to be relatively low on control in comparison to a classic patient-doctor interaction, where the doctor is the one holding the information and giving the options (Rupert et al. 2014). Therefore, whenever a patient uses social media to obtain relevant information on a disease or to find support from others who will listen to them, it is expected that this patients’ need for autonomy will be more fulfilled.

H1: The use of social media as a source of informational support increases patient’s perceived autonomy.

Social media that are used for social support are expected to have influence on the perceived competence. As previously established, competence is about effectively engaging in health-related behaviours, and having the possibility to act upon capabilities concerning health-related behaviours. Competence can be supported by making people fully understand and master certain behaviours, providing them with appropriate instructions and feedback that will help them master the behaviours, providing them with tools, and letting them engage in challenging activities (Niemic et al. 2009). Some of these types of support can be found on social media. For example, users of social networking sites have been found to educate each other and build expert knowledge together (Smailhodzic et al. 2015), hereby mastering the knowledge that is available about a disease. Moreover, learning from similar others such as peers -as

opposed to doctor- has been shown to increase peoples belief in their efficacy to also conduct this specific behaviour (Bandura 1989). Although self-efficacy is not identical to competence, it is an important aspect of competence. The informational aspect does seem more important for the fulfilment of the need for competence, as it helps individuals understand and even master the knowledge that is needed to engage in health-related behaviours. In line with this, we hypothesize:

H2a: The use of social media as a source of informational support increases patient's perceived competence.

H2b: The use of social media as a source of emotional support increases patient's perceived competence.

Social support that is found on social media is also expected to have effects on perceived relatedness. The need of relatedness becomes fulfilled when a person has a sense of belonging and feels respected, understood and cared for, this feeling arises for example when someone tries to take your perspective (Deci and Ryan 2000). These are also behaviours that have been found on social media. Users of social media have been found to groom their fellow sufferers by showing solidarity and by valuing one another (Smailhodzic et al. 2015). This type of support is likely to increase the sense of belonging, as others have taken the time to take your perspective and to make you feel valued. Moreover, although information support is foremost about providing someone with useful information, it is a form of support that involves one person signalling willingness to help another person, which may increase this individual's feeling of being cared for. Hence, perceived relatedness is expected to increase when someone is provided with both informational and emotional support via social media.

H3a: The use of social media as a source of informational support increases patient's perceived relatedness.

H3b: The use of social media as a source of emotional support increases patient's perceived relatedness.

So far, social support that is provided on social media has been linked to several outcomes for patients. The current research proposes that these outcomes can be largely explained by the mechanism of SDT. Anderson et al. (1991) have defined patient empowerment as maximizing self-care knowledge, skills and self-awareness. Empowered patients are patients who have the necessary knowledge about their disease to make their own decisions and to set goals. It differs from traditional patient education that is often provided by the doctor in the sense that empowerment is not directed at increasing adherence to doctor's advice (Anderson et al. 1991). Empowerment instead aims at providing the patient with the knowledge and the skills to make the right decisions, which could also diverge from the doctor's recommendations.

The relationship between social media use and patient empowerment that has been reported (Househ et al. 2014) is expected to be mediated by the concept of social-determination. Patients often join social media to find informational support (Antheunis et al. 2013). As previously hypothesized, this informational support has the potential to increase patients' feelings of self-determination. In turn, the fulfilment of the need for competence and autonomy are both important for empowerment. Competence is related to effectively dealing with a disease, and thus maximizing self-care knowledge and skills, while autonomy refers to being the perceived origin of one's actions and forms an important aspect of empowerment (Ryan and Deci 2002) For example, a patient who has read online about his or her disease and the medicine, treatments, exercises and diets available is likely to feel more competent about engaging in self-care. Moreover, by obtaining the right information the patients will feel more autonomous and capable of making decisions by themselves. The combination of autonomy and competence will allow patients to make their own decisions, and thus to be empowered in their interactions with doctors.

H4: The effect of informational support found on social media leads to increased empowerment through the fulfilment of the needs for self-determination.

The relationship between social support that is found on social media and the self-management of a disease is also expected to be mediated by self-determination. Self-management with regards to chronic diseases refers to having the required skills to deal with a disease. According to Heisler et al. (2002) the two key activities for becoming able to self-manage a disease are: engaging in health-promoting activities, and interacting with doctors and adhering to their advice. For some patients it may nonetheless be very challenging to self-manage a disease, even more so when a doctor does not offer adequate support for self-management (Glasgow et al. 1997). Moreover, self-management of chronic diseases requires a great

amount of motivation in order to adhere to certain treatments, diets, or exercise programs (Heisler et al. 2002). Through the fulfilment of the need for self-determination, people have been found to become intrinsically motivated, which is generally linked to better and more stable outcomes as compared to extrinsic motivation (Deci and Ryan 2000). Therefore, the fulfilment of these needs could be important for the ability of self-managing a disease. To illustrate this relationship: a patient who uses social media as a source of social support - both informational and emotional - is expected to feel more autonomous and competent, as was previously hypothesized. The fulfilment of these needs in turn increases this person's intrinsic motivation to self-manage the disease, resulting in more stable and better self-management, even in the absence of an explicit reward related to the behaviours. Besides, not all patients are provided with an equal amount of support from their doctor and some patients may generally feel that dealing with their disease is hard and that they are not competent enough to manage their disease. However, use of social media enables them to obtain more informational and emotional support than they would from their doctor alone. If this is done successfully, it increases their perceived self-determination and hereby they would feel more able to self-manage their disease. In line with this, we hypothesize:

H5: The effect of social support found on social media leads to increased perceived ability of self-management through the fulfilment of the needs for self-determination.

Shared decision-making is a type of interaction between doctor and patient and refers to “an approach where clinicians and patients make decisions together using the best available evidence”. Patients are encouraged to think about the available screening, treatment, or management options and the likely benefits and harms of each so that they can communicate their preferences and help select the best course of action for them” (Elwyn et al. 2010). However, shared decision-making is quite rare in healthcare because patients “feel intimidated and unable to make a difference in the relationship, are reluctant to bother the doctor and do not understand the language or know the script” (Godolphin 2009). According to Elwyn et al. (2010), the doctor plays an important part in shared decision-making as he or she is the one providing the patient with options. Another important factor in shared decision-making is the access to decision support in the form of decision aids. This support is often informational in nature, and can aid the patient in understanding more about the disease. Healthcare related social media can be considered a decision aid as they can provide patients with the necessary information about the different available options, and provide them with personal experiences of other patients. As Elwyn et al. (2010) point out, it is not always straightforward which treatment or medicine offers the best solution, and in this case personal experiences can help evaluating the options. In short, this informational support can be seen as an decision aid, and it helps the patient become more able to ‘understand the language or know the script’. Moreover informational support can increase someone's feeling of self-determination, which includes their capability of interacting with the social environment (Ryan and Deci 2002). Hereby, fulfilment of the need of self-determination tackles the problem of patients feeling intimidated and not able to make a difference in the relationship remains. Moreover, the use of social media makes the patient less dependent on the information provided by the doctor and thus increases the patients' self-determination. Consequently, the patient is better able to choose what option would fit his or her needs best, and to communicate this to the doctor. In this way fulfilment of the need self-determination mediates the influence of social media use on shared decision-making.

H6: The effect of social support found on social media leads to increased shared decision-making through the fulfilment of the needs for self-determination.

Trust in doctor refers to a doctor's integrity, competency, and role as the patient's agent, as perceived by the patient (Safran et al. 1998). The amount of trust one has in his or her doctor is important for the interactions that will take place as it can be a prerequisite for open communication about potentially personal topics, to express emotions, and discuss thoughts that might differ from the doctor's ideas (Mechanic and Schlesinger 1996). Shared decision-making is one type of interaction that can occur between patient and doctor, and as was previously hypothesized, it will more likely occur when a patient perceives him or herself as more competent with regard to a disease. This hypothesized relationship is expected to be altered by the amount of trust a patient has in his or her doctor, as trust is essential to the doctor-patient interaction. It is expected that patients who perceive themselves as competent, but who do not trust their doctor will not engage in shared decision-making, and would rather try to make autonomous decisions or look for other sources of information besides their doctor. Kraetschmer et al. (2004) found that shared decision-making is linked to trust between doctor and patient, and that it even

might be a prerequisite to shared decision-making. Moreover, it has been found that patients who do not trust their doctor prefer to make decisions by their selves or to look for a second or third opinion (Kraetschmer et al. 2004). On the other hand, patients who feel competent and also trust their doctor are expected to engage more in shared decision-making, as they are competent enough to engage in the discussion and they are trusting enough to reveal their personal issues. In line with this logic and these findings, we argue that trust in a doctor positively moderates the relationship between perceived self-determination and shared decision-making.

H 7: The effect of perceived self-determination on shared decision-making will be stronger for patients who have more trust in their doctors.

Methods

Data and procedure

To test our hypotheses, we will conduct a longitudinal survey amongst diabetes patients. Data collection targets at diabetes patients who made use of the newly established social media platform for diabetes (Diabetestrefpunt) patients in the Netherlands. It has currently over 2000 registered members. Data collection will be conducted via a project leader of the online community who approached the members and visitors through the forum. Initial survey was deployed in the end of April 2016 and so far we received 169 responses. We will repeat our survey in October 2016 and April 2017, thus having three time points for data collection. To increase our survey response rates, we will send reminder on two occasions for each time we conduct survey. In addition, we offered 10 randomly selected participants to win a monetary prize. Once we finalize data collection, we will control for non-response bias with t-test as well as for common method bias with Harman's test (Podsakoff et al. 2003). Furthermore, in next rounds of surveys, we plan to include marker variables to account for common method bias (Williams et al. 2010). What follows below is the description of measures. To measure our concepts, we will rely on a 7-point Likert scale, which represents the most common method for scaling responses in survey research. With this scale, the respondents express their agreement or disagreement on a agree-disagree scale for a number of statements.

Measures

Wherever possible validated measures were either used or adapted to fit the purpose of this study. As the study was conducted on a Dutch platform, all questionnaires have been translated to Dutch and translated back into English to guarantee adequate translation. Whenever these latter translations did not match with the official English questionnaires, the translation was reconsidered.

Independent variables

Social support. In order to measure the extent to which Diabetestrefpunt was used as a source of social support 10 items from the 2-Way Social Support Scale (2-Way SSS) were adapted (Shakespeare-Finch and Obst, 2011). These items together comprised the constructs of receiving emotional support and receiving informational support. Example items include: "When I am feeling down, there is someone I can lean on in this platform", "This platform enables me to have a circle of people who value me" (Emotional support) and "People here help me to learn what medicines to take and/or what diets to follow", "This platform enables me to read and exchange information about doctors and treatments".

Mediator

Self-determination. The sub-constructs of self-determination were measured using an adapted version of the scale of Wilson et al. (2006) which originally measures self-determination directed at exercising. This original scale was found reliable by the developers ($\alpha > .90$). The adaption resulted in a scale with 12 statements that covered the constructs of autonomy, competence and relatedness with regards to dealing with diabetes. Example items include: "I feel that I am able to cope with my diabetes", "I feel free to make my own choices in managing diabetes", "I feel connected to the people who also have diabetes".

Moderator

Trust in doctor. Four items were used to assess a doctor's integrity, competency, and role as the patient's agent, as perceived by the patient. These items were taken from the sub-construct "trust" of The Primary Care Assessment Survey (Safran et al. 1998). Participants were asked to what extent they agreed with the four statements in regards to their trust in their doctor.

Dependent variables

Empowerment. The measurement of empowerment was based on the Diabetes Empowerment Scale Short Form (Anderson et al. 1991). The original scale has been validated and found reliable by the developers of the scale ($\alpha = .84$). It measures several sub-constructs, of which "managing the psychosocial aspects of diabetes" was closest to the definition of empowerment that is used in this study: "an empowered patient would be a patient who feels in control regarding the way he or she deals with a disease. Four items from this subscale were used and participants were asked to rate the extent to which they agreed with the statements. Example items include: "I know enough about diabetes to make the right choices".

Self-management. Self-management of diabetes was measured on five domains in accordance with Heisler et al. (2002). All five items represent an important domain of self-management of diabetes the scale is used in its original form. Example items include: "I believe I am able to follow my own diet plan", "I believe I am able to take medication on my own".

Shared decision-making. Four items were adapted from the patient decision-making Scale (Lerman et al. 1990). The example statements for this construct include: "I suggested a certain kind of medical treatment to my doctor" and "I insisted on a particular kind of test or treatment for my symptoms. Example items include: "I insist on particular test, treatment or medicine from my doctor".

Control variables

The control variables included in this study are: age, sex, education, role of the participant (patient or caregiver), type of diabetes, duration of disease, and whether the participant suffered other diseases, patient satisfaction. In the next rounds of survey, we may also include control variable of using other types of social media for health related purposes.

Conclusion and future steps

This research departs from existing literature by proposing an exploratory mechanism of self-determination theory for the patient outcomes and doctor-patient interactions as a result of social media. We contribute to the health information systems as lead IS scholars have called upon research in this context (Agarwal et al. 2010; Fichman et al. 2011). Our arguments are based on the self-determination theory. We acknowledge that the use of a different perspective such as a guardianship would lead to different hypotheses. In fact, the concept of guardianship would for example suggest that the doctors act as guardians of patients and therefore reduce their locus of control in decision making. However, we argue that the use of social media leads to higher self-determination and hypothesize the effects on doctor-patient accordingly. In regards to future steps, we will run exploratory analysis as well as test our initial hypotheses once the first survey is complete. Based on this, we may make adjustments in our survey for the 2nd and 3rd round of the data collection. Furthermore, we acknowledge that quality of health social media is diverse (Sillence et al. 2007). Although this issue is beyond the scope of our research, it may be an important factor that influences potential effects of social media use by patients on doctor-patient interactions.

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