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# Seeking Health Information on Social Media:
## A Perspective of Trust, Self-Determination, and Social Support

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## ABSTRACT

In the past few years, social media has changed the ways that health seekers seek health information. However, despite the tremendous growth of social media applications in the health-care industry, trust is still among the biggest challenges for social media health services in gaining greater acceptance. Drawn from previous literature on self-determination theory, social support, and trust, this study investigates people's intentions to seek health-information on social media. The authors carefully selected a sample from Italy with subjects who already had experience in seeking health information on social media. The empirical results show that informational support, emotional support, and the satisfaction of people's autonomy and relatedness needs play an important role through trust in influencing people's health-information-seeking intentions on social media. This study is among the first to adopt the theories of self-determination, social support, and trust to investigate people's intentions to seek health information on social media.

## KEYWORDS

## INTRODUCTION

In the past ten years social media has deeply changed people's life style (Zhan, Sun, Wang and Zhang, 2016). Many individuals not only use social media for social networking, they also use it for seeking health-care information. According to the Health Tracking Survey by the Pew Research Center (Chen, Hou & Zhao, 2016), seeking health information is an activity that has remained consistently popular on social media in the past seven years. Nearly one in three persons has discussed health-related issues on social media (Honigman, 2015). The health-related topics that individuals frequently search on social media include specific diseases or medical problems, certain medical treatments or procedures, weight control, health insurance, food safety or recalls, drug safety or recalls, advertised drugs, medical test results, aging, pregnancy, childbirth, and health-care cost (Fox & Duggan, 2013). More than 40 percent of consumers say that information found via social media affects the way they deal with their health (Honigman, 2015).

Nonetheless, despite the proliferation of health information-seeking activities in social media, several issues remain. One of the biggest issues is that a considerable percentage of individuals still don't fully *trust* the health information from social media (Antheunis, Tates, & Nieboer, 2013). Trust

is widely considered as an important pre-condition for the adoption of any electronic services (Beldad, Jong, Steehouder, 2010). Due to the fact that people are more sensitive to potential risks associated with health-decisions (Li, Wang, Lin & Hajli, 2016), trust plays an even more significant role in the context of online health service. Prior studies have indicated that peoples' trust of online health information is a major factor that influences their follow-up health information seeking, discussing and sharing activities (Lin, Zhang, Song & Omori, 2016). After all, both health-care professionals and lay users can post health related information on social media, which often makes the health-related information on social media inconsistent, misleading, and not trustworthy (Lin, Zhang, Song & Omori, 2012). Based on a national survey of 3,014 adults living in the U.S., one in five people finds the health information online is different from their clinicians' opinion (Fox, Duggan, Rainie, & Purcell, 2013). Individuals usually do not have corresponding health expertise to judge the quality of online health information. In such an uncertain situation, individuals need to seek assurance for their beliefs. Therefore, trust beliefs are important because they help individuals overcome perceptions of uncertainty and risk (McKnight et al., 2002). If individuals trust online health information, they probably believe that online health information is of high quality and will probably seek online health information again. Therefore, it is important to understand the role of trust beliefs in supporting individuals' seeking online health information.

## LITERATURE REVIEW

Health-information-seeking behaviors are closely related to the behaviors of information searches. Information search activities satisfy individuals' cognitive and affective needs during processing tasks such as decision-making, problem solving, and knowledge generation (Wilson, 1999). Therefore, information search activities often precede a decision action (e.g., a decision to use a particular health product or service) (Cox, 1967). The primary rationale for searching for information is to alleviate uncertainty about the decision (Hansen, 1972).

Information seeking in the health context is an important component of coping with illness and health-related uncertainty. This has been the case since long before the Internet era. Before the Internet, physicians held almost exclusive access to health-care information or expert health knowledge. Apart from health-care providers, the external sources for individuals seeking health information were limited to local experts and mass media. In this period, the study of information-seeking behaviors often focused more on the health information seekers' internal attributes including gender, social status, demographics, attitudes (Kassulke, Stenner-Day, Coory, & Ring, 1993), health-related knowledge, locus of control beliefs, and the value they placed on health (Wallston, Maides, & Wallston, 1976). Research considered health information seeking mainly as a component of the decision-making process, and it focused mostly on uncertainty.

In the late 1990s the Internet quickly became a major source of health information for the public at large (Cline & Haynes, 2001). The Internet enjoys many advantages in providing health information. First, it is immediate, convenient, and comprehensive. It affords health seekers instantaneous access to an incredible amount of health information and a variety of perspectives on the same health topics (Cline & Haynes, 2001). Second, it is anonymous. It allows health seekers to ask awkward, sensitive, or detailed questions without the risk of facing judgment, scrutiny, or stigma (Cotten & Gupta, 2004). Third, it decreases the inequalities associated with health-care provision and decision-making (Sillence, Briggs, Harris, & Fishwick, 2007). It serves to disseminate health information to marginalized groups (e.g., uninsured, low-income, less educated, or minority individuals) and to empower health-care consumers. Using the health information obtained on the Internet, patients or health seekers can do a better job in self-care (Antheunis et al., 2013). In fact, prior studies suggest that online health information seekers are healthier than offline groups (Cotten & Gupta, 2004).

Despite its many advantages, seeking health information on the Internet is not without disadvantages. Although the Internet acts as an equalizer of health information, it also creates a digital

divide between those who don't have access to the Internet and don't have computers skills and those who do (Cotten & Gupta, 2004). Internet and website accessibility issues create difficulties for those with health impairments (Cotten & Gupta, 2004). Due to a lack of sufficient online health content regulation, credibility of health information on the Internet is also a concern (Chou, Hunt, Beckjord, Moser, & Hesse, 2009). Prior studies (Impicciatore, Pandolfini, Casella, Bonati, & others, 1997) show that only nine of forty-one surveyed websites provided correct instructions regarding how to take the temperature of a child. In this period, credibility, or trust toward online health services, has become important research topics (Morahan-Martin, 2004).

Since the early 2000s the emergence of social media has further changed the way health seekers search for health information. The use of social network sites enhances social support, social connectedness, and social presence for users and improves users' psychological well-being for users (Erfani, Abedin & Daneshgar, 2013, 2016). "A tweet a day keeps the doctor away" (Chhanabhai, 2009). Meta-analysis (Laranjo, Arguel, Neves, Gallagher, Kaplan, Mortimer, Mendes & Lau, 2015) shows that participation in social media is an effective intervention that positively affects individuals' health. The advantage of social media as compared to the Web 1.0 Internet is that it not only satisfies individuals' needs for health information, it also provides emotional support and satisfies individuals' intrinsic needs (Wang & Li, 2014). Through applications such as social networking sites (e.g., Facebook and Twitter), wikis, blogs, podcasts, video streaming (e.g., YouTube), and many others, social media platforms provide a wide variety of bidirectional communication tools that connect health seekers with similar health concerns (Boulos & Wheeler, 2007). In particular, patients who have chronic diseases, disabilities, cancers, or who need to recover from surgeries can find those who are in similar situations on social media and form online support and self-help groups (Maloney-Krichmar & Preece, 2005). Such groups usually get a higher level of trust among group members because they have a common interest or a shared purpose that facilitates a sense of togetherness (Maloney-Krichmar & Preece, 2005). Prior studies show that the information, social support, and empathy that patients gain from their support groups on social media platforms help them cope with their illnesses (Maloney-Krichmar & Preece, 2005).

Social has brought new possibilities to this research of health-information-seeking behaviors. Greene, Choudhry, Kilabuk and Shrank (2011) qualitatively evaluate the content of communication in the 10 largest Facebook communities dedicated to diabetes. They find that patients with diabetes, family members, and their friends use Facebook to share personal clinical information, to request disease-specific guidance and feedback, and to receive emotional support. In addition, based on a survey of 231 breast cancer patients, Kim, Shah, Namkoong, McTavish and Gustafson (2013) find that social support perception and emotional well-being interacted with each other to influence online health information seeking behavior on social media based. Hou and Zhao (2016) examine the health information seeking behavior on social media through the lens of the theory of planned behavior. They find that the intention of health information seeking behavior is influenced by factors such as health information literacy, health status and the gratification of social media mediated by the attitudes, subjective norms, perceived behavioral control.

Prior studies have also investigated in the sociodemographic factors that influence the health information seeking behavior on social media. For example, a survey of 1039 parents (Bianco, Zucco, Nobile, Pileggi & Pavia, 2013) shows that females with a high school diploma or college degree with chronic conditions are more likely to seek health information on social media. Tennant, Stellefson, Dodd, Chaney, Paige and Alber (2015) find that most sociodemographic variables (e.g., gender, race/ethnicity, health status, income, employment, marital status) don't have significant effect on health information seeking behavior on social media among baby boomers and older adults, whereas the level of education, electronic device use and gender do have significant effect.

To summarize, from the pre-Internet period to the early days of the Internet to the rise of social media platforms today, the research in health information seeking has extended from the individual decision-making perspective (Wallston et al., 1976) to a perspective of group dynamics (Maloney-

Krichmar & Preece, 2005) and sociality (Sarasohn-Kahn, 2008). The theories that have been used to study health information seeking and the models that have been developed include stress, appraisal, and coping theory, monitoring and blunting hypothesis, the information-seeking model, the health information acquisition model, the comprehensive model of information seeking and the expanded model of health-information-seeking behaviors, theory of planned behavior, gratifications theory (Lambert & Loiselle, 2007; Chen, Hou & Zhao, 2016).

The extensive literature review confirms no prior studies have studied the health information seeking behaviors in the context of social media from the theoretical lens of three dimensions of the trust, self-determination and social support. Therefore, we identify trust toward online health services[1] as one of the focal constructs of this study. Numerous researchers have shown that trust leads to a variety of trust-related behaviors including sharing personal information, making a purchase, or acting on information provided by a website (McKnight, Choudhury, & Kacmar, 2002). It is not surprising that trust toward online health services plays a positive role in the context of this study. Prior studies have identified trust as a multidimensional concept that includes three types of trust beliefs: benevolence, competence, and integrity. Therefore, the first research question of this study is: (1) How does each of the three dimensions of trust toward online health services affect individuals' intentions to use social media to seek health-related information?

Numerous studies have investigated the antecedents of trust in a business context, such as with e-commerce (McKnight et al., 2002, Jia, Cegielski & Zhang, 2014), but what are the antecedents of trust toward online health services? Knowledge on this topic is severely limited. Social media is a context that is significantly different from a business context because users' behavior on social media is voluntary and driven by intrinsic motivators rather than monetary reward (Wang & Li, 2014). Therefore, using intrinsic motivation theories would be more appropriate in studying the aforementioned question. The intrinsic motivation theory that this study adopts is the self-determination theory (SDT). SDT suggest three intrinsic human needs: need for competence, autonomy and relatedness (Ryan & Deci, 2000). Over the past forty years, SDT has developed to become a major theory of human motivation (Gagné & Deci, 2014). A recent meta-analysis shows that SDT is a viable conceptual framework for studying antecedents and outcomes of motivation in the health-care context (Ng et al., 2012). Therefore, this study's second research question is: (2) How do intrinsic human needs affect individuals' trust toward online health services?

Social media, as compared to Web 1.0 technologies such as static websites, enjoy significant advantages in providing health-care services because they provide not only informational support but also emotional support. Social media help to connect patients with each other who have similar health concerns so they know they're not alone. A prior study (Fergie, Hilton & Hunt, 2015) finds that social media users with chronic diseases such as diabetes actively seek and interact with the users with similar health conditions. Research shows that 23 percent of social media users follow a friend's health experiences or updates (Honigman, 2015). Based on these facts, we raise the third research question: (3) How do informational support and emotional support affect individuals' trust toward online health services?

To answer the three research questions proposed above, we integrate previous literature on trust, psychology, and social media. Our study focuses on the long-term relationship between individuals and online health services, which has received relatively little attention in previous literature (Sillence, Briggs, Harris, & Fishwick, 2006)[2]. Therefore, we carefully select individuals who already have experiences in seeking health information on social media as the subjects of this study.

This study has two significant contributions. First, this study clarifies the role of trust toward online health services in supporting individuals' future intention to search health information in social media. Second, this study shows how to enhance individuals' trust toward online health services by supporting their intrinsic motivators and providing social supports. The following section will elaborate on our theoretical underpinnings and describe the hypothesis development process.

## THEORETICAL FOUNDATION AND HYPOTHESES DEVELOPMENT

### Theoretical Foundation

Trust is defined as "the willingness of a party (trustor) to be vulnerable to the actions of another party (trustee) based on the expectation that the other (trustee) will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party (trustee)" (Mayer et al. 1995, p. 712). In the context of social media, individuals seeking online health information are trustors and online health services, referring to online health information, or more specifically, the trustees. In social media, everyone can contribute health information and there is no guarantee that the information posted is correct. On the other hand, individuals seeking health information usually have limited knowledge to judge its correctness. Therefore, trust toward online health services is a critical factor in health services (Sillence et al., 2006) because it can help individuals feel that the health information can be trusted and help them solve their health-related issues (Bansal et al., 2010). Otherwise, when individuals do not trust online health information, their uncertainty remains and their health-related issues are not solved. In such a context, they may not apply the health information found and eventually stop seeking health information online.

Previous literature has conceptualized trust differently such as a belief, attitude, intention, and behavior (McKnight et al., 2002). Our study conceptualizes trust as a belief and focuses on the effect of trust beliefs on intention to seek online health information. Trust beliefs refer to "trustor's perceptions of trustee attributes that may influence trustee's behavior" (Bhattacherjee, 2002, p.214). McKnight et al. (2002) state that there are three dimensions of trust beliefs: competence (ability of the trustee to meet the truster's needs), benevolence (trustee caring about truster's interests), and integrity (trustee promise keeping).

To understand how to support individuals' different trust beliefs, we draw upon previous literature on psychology and social commerce. For benevolence trust beliefs, we derive their antecedents from SDT, which identifies three essential psychological needs (Ryan & Deci, 2000): competence (Harter, 1978; White, 1963), relatedness (Baumeister & Leary, 1995; (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000), and autonomy (DeCharmes, 1968; Deci, 1975).

SDT argues that satisfying those three psychological needs can result in various positive outcomes such as general well-being (Ryan, Deci, & Grolnick, 1995) and dedication at work (Vansteenkiste et al., 2007). In the context of social media, the three psychological needs have been argued to be positively related to the motivation to contribute content (Wang, 2014; Wang & Clay, 2012; Wang & Li, 2014). Note that SDT examines how to support individuals' motivation rather than how to create individuals' motivation. In other words, SDT focuses on how to maintain individuals' intention such that individuals will keep engaging in certain activities. This perspective is consistent with our focus of individuals' future intention to seek online health information.

In this study, we focus on the needs for autonomy and relatedness[3]. Need for autonomy is defined as the desire to feel like the initiator of one's own actions (DeCharmes, 1968); need for relatedness refers to the desire to establish and maintain mutual care (Baumeister & Leary, 1995) (Harlow, 1958). Also, following previous literature (Ryan & Deci, 2000), we use perceived autonomy to refer to the degree to which individuals' need for autonomy is satisfied and perceived relatedness to refer to the degree to which individuals satisfy their needs for relatedness.

For competence trust beliefs, we draw upon recent literature on social commerce. Previous literature has suggested that social support from social media can increase individuals' trust, commitment, and satisfaction toward online communities (Hajli, 2014). Here, social support includes both informational and emotional support, and our study examines the effects of informational and emotional support on competence trust beliefs.

## Trust and Intention to Seek Health Information

Seeking health information refers to the search for information that helps "to reduce uncertainty regarding health status" and "construct a social and personal (cognitive) sense of health" (Tardy & Hale, 1998). Trust toward online health services is essential to promot the intention to seek health information on social media because trust can help individuals overcome perceptions of uncertainty associated with online health information. Without trust, individuals may not believe the health information in social media. Previous literature has shown that trust is positively related to satisfaction (Gummerus, Liljander, Pura, & van Riel, 2004) and attitudes toward discourse (Zimmer, Arsal, Al-Marzouq, & Grover, 2010) in online health services.

Trust beliefs may change as individuals gain experiences with the trustee. Our work focuses on the ongoing trust beliefs toward online health services, which refer to a relationship in which individuals already have sought online health information and have some perceptions toward the credibility of health information by observing the consequences of applying the health information. Individuals can trust different aspects of health services on social media including benevolence, competence, and integrity (McKnight et al., 2002; Zimmer et al., 2010).

Benevolence trust beliefs are defined as the degree to which trustees act in trusters' interests (McKnight et al., 2002) based on altruism (Mayer, Davis, & Schoorman, 1995). Benevolence trust beliefs bring faith and reduce uncertainty in a relationship (Bhattacherjee 2002). In other words, benevolent trustees would choose to help trustors, even when there is no requirement or rewards to do so. In the context of our study, benevolence trust beliefs reflect how individuals perceive that others in social media act in their interests, such as keeping their personal information private, caring about their health issues, and trying to help solve those issues. When individuals perceive that their personal information is protected and that others in social media try their best to solve their health issues, their benevolence trust beliefs are probably increased. In such a context, individuals are more likely to feel safe and cared for and to seek health information.

Competence trust beliefs are defined as the degree to which trustees are capable of meeting trusters' needs (McKnight et al., 2002). Individuals' competence trust beliefs may be based on prior experiences. In the context of this study, individuals' competence trust beliefs may be based on two related beliefs: 1) whether others in social media are competent to provide relevant health information; 2) whether the health information can help solve the health-related issues. Specifically, individuals visit social media to solve their health issues and receive useful health advice. Therefore, those sites need to provide useful health information. When individuals perceive that social media can provide useful health information, they probably have a higher level of competence trust toward those communities. Thus, they are probably willing to visit the sites and seek health information again.

Integrity trust beliefs are defined as the degree of trustees' honesty and reliability (McKnight et al., 2002) and reflect trustors' perception regarding whether trustee will adhere to a set of principles or rules acceptable to the trustors after interactions (Bhattacherjee 2002). Integrity trust beliefs can support trustors' confidence in trustee behaviors and reduces trustors' perceptions of risk (Bhattacherjee 2002). In the context of this study, rules of integrity include: 1) provide relevant health information; 2) use of private information from individuals seeking health information. Therefore, integrity trust beliefs reflect whether individuals believe that social media will support them in obtaining health information and protect their personal data. When individuals believe those sites will provide reliable services, their integrity trust beliefs are probably increased. Consequently, individuals are more likely to seek health information in those communities.

To summarize, we argue that:

**H1a:** Benevolence trust beliefs toward health services on social media are positively related to the intention to seek health information.

**H1b:** Competence trust beliefs toward health services on social media are positively related to the intention to seek health information.

**H1c:** Integrity trust beliefs toward health services on social media are positively related to the intention to seek health information.

## Psychological Need and Benevolence Trust Beliefs

Individuals' perceived autonomy is higher when they feel they can initiate their own activities (DeCharmes, 1968); individuals' perceived relatedness is higher when they feel connected to and cared for by others (Baumeister & Leary, 1995) (Harlow, 1958). Previous literature has found that higher perceived autonomy and relatedness can result in positive outcomes such as daily emotional well-being (Reis et al., 2000), relationship well-being (Patrick, Knee, Canevello, & Lonsbary, 2007), and satisfaction with social network sites (Wang & Li, 2015). In the context of online health services, previous literature has found that need fulfillment in general is positively related to trust (Gummerus et al., 2004). Individuals have a higher level of perceived relatedness (i.e., their need for relatedness is satisfied) when they feel that others they interact with on social media care about their health and well-being and are not just trying to promote certain health services and earn money. In such a context, they are more likely to feel that others care about their interests and try to help solve their health-related issues, leading to a higher level of benevolence trust beliefs.

In addition, individuals' perceived autonomy is also increased (i.e., their need for autonomy is satisfied) when they can choose when to visit sites, and what health information to seek. In such a context, individuals probably perceive an internal locus of causality (DeCharmes, 1968). According to SDT, perceived autonomy can facilitate integration of activities into individuals' own value (Ryan and Deci, 2000). In the context of our study, perceived relatedness can let individuals perceive that the sites are benevolent and attract them to seek health information. However, individuals may not maintain their perception of benevolence toward online health services and integrate seeking health information into their own value unless they experience autonomy in such a process. In other words, integration of benevolence perception into individuals' own value requires deep and holistic processing, and such a processing is supported by a sense of choice and autonomy (Ryan and Deci, 2000). To summarize, both perceived relatedness and perceived autonomy are important to support individuals' benevolence trust beliefs.

Therefore, we hypothesize that:

**H2a:** Perceived autonomy is positively related to benevolence trust beliefs toward health services on social media.

**H2b:** Perceived relatedness is positively related to benevolence trust beliefs toward health services on social media.

## Social Support and Competence Trust Beliefs

Social support is defined as perceived care, love, and support of members of a group (Cobb, 1976), and it provides individuals with emotional aid and informational support (Wellman & Wortley, 1990; Wellman et al., 1996) . Previous literature has found that social interaction and support in online communities can affect consumers' purchase decisions (Kozinets, Wojnicki, Wilner, & De Valck, 2010). In the context of online health services, previous literature has also found that social support in social media helps individuals deal with their illnesses (Maloney-Krichmar & Preece, 2005).

Social support can provide a foundation for people to form their competence trust beliefs. Individuals come to social media to obtain relevant health information and advices so they can deal with their health issues. Here, informational support can provide individuals with relevant health information so they can gain better knowledge about their health issues including potential causes, how to deal with them (Morahan-Martin, 2004), and what they need to pay attention to in the future.

Thus, individuals are more likely to perceive the sites to be competent, especially when the information is of good quality (Sillence et al., 2006).

In addition, emotional support from social media can bring warmth to individuals and help them deal with their health issues more effectively. In the communication literature, Burleson (2003) defines emotional support as consisting of "specific lines of communicative behavior enacted by one party with the intent of helping another cope effectively with emotional distress" (p. 552). Individuals seek health information in social media often because they or someone else in their lives have certain health related issues. In such a context, individuals can be upset or stressful. Emotional support from others can help those individuals deal with those negative emotions and make them feel better (Stroebe & Stroebe, 1996). By improving individuals' emotional states, emotional support can enhance their perception of helpers' competence in several ways (Jones, 2004). First, emotional support can reflect helpers' competence to express understanding and sensitivity. Second, emotional support can convey genuine and honest help intentions. Third, emotional support can show that others are taking individuals' concerns seriously. Previous literature has found that emotional support can increase individuals' perception of helper competence (Jones, 2004).

Together, by providing information and emotional support, social media can let individuals feel that they can relevant and useful health information to help solve their health-related issues, increasing their competence trust beliefs toward online health services. Therefore, we postulate the following hypotheses:

**H3a:** Emotional support in social media is positively related to competence trust beliefs.
**H3b:** Informational support in social media is positively related to competence trust beliefs.

Our research model is shown in Figure 1.

## METHOD

In this section, we present the measurements, data collection procedure, data analysis and results of our study.

### Measurements

Our measurements were adapted from previous literature. Items from perceived autonomy and perceived relatedness were adapted from Ke and Zhang (2010). Items from Ke and Zhang (2010) were developed based on previous SDT literature (Deci et al., 2001), and is quite close to the context of our study. Items for emotional and informational support were based on Hajli (2014). Those items were used because the context of Hajli (2014) is quite similar to ours and have gone through a rigorous process of instrument development. Items for trust beliefs were based on McKnight et al. (2002) because it is the theoretical foundation of our study. Lastly, items for intention to seek health information were based on Lin and Lu (2011) and Liang et al. (2011) again because of context similarity. Each question was measured on a seven-point Likert-type scale anchored on 1 = very strongly disagree to 7 = very strongly agree. The final items used are presented in the appendix.

### Data Collection Procedure

To recruit those Italian who seek health information through social media, we employed a company named "SurveyCo" (pseudonym) to conduct data collection. SurveyCo employs various channels to recruit a variety of samples, and manages a computer system to send out invitations. By participating surveys, members can earn points, which can be converted to cash, a charitable donation, or gift cards. To eliminate fraudulent or duplicate respondents, SurveyCo uses Survey Hub and Relevant ID and helps set up quality assurance questions that can detect careless respondents.

**Figure 1. Research Model**
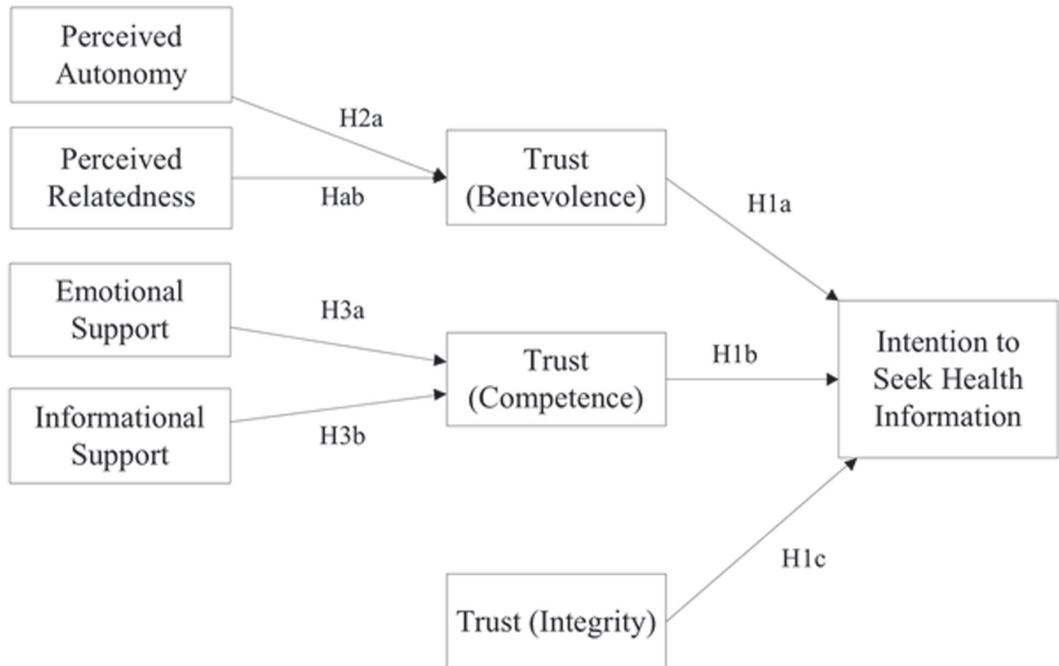


Because this study examines individuals' seeking health information through social media, screening questions were created to filter out those participants who seldom used social media or those who often used social media but seldom seek health information in social media. A total of 915 users were invited to the survey. Among those participants, 594 were qualified. While completing the survey, 450 participants dropped out or failed the quality assurance question. We also remove seven participants who originally come from other places, such as Asia and Africa. Thus, we got a total of 137 individuals from Italy who finished the survey successfully. The demographic data of the participants is shown in Table 1.

## Data Analysis and Results

Because our independent and dependent variables were collected in the same questionnaire, common method bias can be an issue. Therefore, two statistical tests were conducted to assess the common method variance of our data set. First, Harmon's single-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) were conducted, which revealed five factors explaining 71.60% of the variance, and no single factor had significant loading ($p < 0.10$) for all items. Second, we run the marker variable test (Lindell & Whitney, 2001), which showed that, all originally significant correlations remained significant after adjusting for the second smallest positive correlation among the constructs. Therefore, common method bias is probably not an issue for our dataset.

Shapiro-Wilk tests were significant, showing that the measurements were not normally distributed. According to Hair et al. (2014), PLS is more appropriate with non-normally distributed data. Therefore, SmartPLS (Ringle, Wende, & Will, 2005) was used to test our research model. Consistent with prior literature we analyzed our model in two stages (Gefen & Straub, 2005). In the first stage assessing the reliability and the validity of the measurement model, convergent and discriminant validity were examined. Convergent validity was confirmed by meeting the following three criteria (Gefen & Straub, 2005; Hulland, 1999): First, each item loaded significantly on its respective construct, and none of the loadings were below the cutoff value of 0.60 (Table 2). Second, the composite reliabilities (CRs) of

**Table 1. Sample Demographics**

| Category | | Sample |
|---|---|---|
| Gender | Female | 78 (56.9%) |
| | Male | 59 (43.1%) |
| Age | 22 or Below | 12 (8.8%) |
| | 23 - 28 | 15 (10.9%) |
| | 29 - 35 | 23 (16.8%) |
| | 36 - 45 | 32 (23.4%) |
| | Above 45 | 55 (40.1%) |
| Social Media Usage Frequency | More than one time per day | 47 (34.3%) |
| | 4 – 6 times per week | 60 (43.8%) |
| | 2 -3 times per week | 20 (14.6%) |
| | Once a week | 10 (7.3%) |
| Seek Health Information Frequency | More than one time per day | 5 (3.6%) |
| | 4 – 6 times per week | 26 (19.0%) |
| | 2 -3 times per week | 53 (38.7%) |
| | Once a week | 53 (38.7%) |

all constructs were over 0.70 (Table 2). Finally, the average variance extracted (AVE) of all constructs was over the threshold value of 0.50 (Table 2). Discriminant validity was established by ensuring that the correlations between constructs were below 0.85 (Brown, 2006), and for each construct, the square root of its AVE exceeded all correlations between that factor and any other construct (Gefen & Straub, 2005) (Table 3). Therefore, our measures demonstrated good psychometric properties.

In the second stage assessing the structural model (Hulland, 1999), path coefficient and $R^2$ measures were examined (Gefen, Straub, & Boudreau, 2000). Here path coefficients are used to show the strength and significance of relationships between constructs. $R^2$ measures represent the amount of variance in the dependent variable explained by the independent variables.

H1a, stating that benevolence trust beliefs toward online health services are positively associated with the intention to seek health information, was supported ($b = 0.23$, $p < 0.01$). H1b argues that competence trust beliefs are positively associated with the intention to seek health information. This hypothesis was supported ($b = 0.59$, $p < 0.001$). H1c suggests that integrity trust beliefs are positively associated with intention to seek health information. This hypothesis was not supported ($b = 0.03$, $p > 0.05$). H2a posits that perceived autonomy within an online health community is positively related to benevolence trust beliefs. This hypothesis was supported ($b = 0.25$, $p < 0.01$). H2b states that perceived relatedness is positively associated with benevolence trust beliefs. This hypothesis was supported ($b = 0.49$, $p < 0.001$). H3a states that emotional support is positively associated with competence trust beliefs. This hypothesis was supported ($b = 0.28$, $p < 0.05$). H3b, stating that informational support is positively associated with competence trust beliefs, was supported ($b = 0.31$, $p < 0.01$). Our post-hoc power analysis shows that our study has sufficient power (above .80). These results are presented in Figure 2.

Finally, we assess the predictive quality of our model using the Stone–Geisser ($Q^2$) test (Geisser, 1975; Stone, 1974). The model has estimation relevance when $Q^2$ is above 0; otherwise, the model lacks estimation relevance, resulting in a doubtful determination of the latent variable. The $Q^2$ for perceived autonomy is 0.60; the $Q^2$ for perceived relatedness is 0.73; the $Q^2$ for emotional support is

**Table 2. Descriptive Statistics, Item Loadings, and Constructs' AVE and CR**

| Scale Item | Item Mean | Item S. D. | Item Loading | AVE | CR |
|---|---|---|---|---|---|
| AUT1 | 4.68 | 1.24 | 0.90 | 0.77 | 0.93 |
| AUT2 | 4.73 | 1.28 | 0.88 | | |
| AUT3 | 4.50 | 1.31 | 0.87 | | |
| AUT4 | 4.58 | 1.26 | 0.87 | | |
| REL1 | 4.69 | 1.17 | 0.88 | 0.73 | 0.92 |
| REL2 | 4.48 | 1.16 | 0.84 | | |
| REL3 | 4.84 | 1.17 | 0.84 | | |
| REL4 | 4.53 | 1.20 | 0.86 | | |
| ES1 | 4.64 | 1.14 | 0.88 | 0.81 | 0.93 |
| ES2 | 4.77 | 1.20 | 0.92 | | |
| ES3 | 4.74 | 1.16 | 0.89 | | |
| IS1 | 4.93 | 1.18 | 0.85 | 0.79 | 0.92 |
| IS2 | 4.96 | 1.09 | 0.93 | | |
| IS3 | 4.79 | 1.08 | 0.89 | | |
| TB1 | 4.39 | 1.22 | 0.80 | 0.74 | 0.92 |
| TB2 | 4.55 | 1.26 | 0.88 | | |
| TB3 | 4.38 | 1.15 | 0.90 | | |
| TB4 | 4.62 | 1.13 | 0.86 | | |
| TC1 | 4.34 | 1.17 | 0.91 | 0.81 | 0.94 |
| TC2 | 4.20 | 1.19 | 0.90 | | |
| TC3 | 4.26 | 1.17 | 0.87 | | |
| TC4 | 4.48 | 1.28 | 0.91 | | |
| TI1 | 4.32 | 1.11 | 0.87 | 0.78 | 0.93 |
| TI2 | 4.68 | 1.13 | 0.89 | | |
| TI3 | 4.45 | 1.05 | 0.89 | | |
| TI4 | 4.46 | 1.18 | 0.88 | | |
| SEE1 | 4.50 | 1.37 | 0.92 | 0.75 | 0.95 |
| SEE2 | 4.34 | 1.34 | 0.90 | | |
| SEE3 | 4.38 | 1.34 | 0.92 | | |
| SEE4 | 4.83 | 1.28 | 0.84 | | |
| SEE5 | 4.55 | 1.38 | 0.80 | | |
| SEE6 | 4.41 | 1.43 | 0.82 | | |

0.81, the $Q^2$ for informational support is 0.79, the $Q^2$ for benevolence trust beliefs is 0.74, and the $Q^2$ for competence trust beliefs is 0.81; the $Q^2$ for integrity trust beliefs is 0.78, and the $Q^2$ for intention to seek health information is 0.75. Therefore, our model has good predictive relevance overall.

**Table 3. Correlation Between Constructs, AVE and Square Root of AVEs (on Diagonal)**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 Perceived Autonomy | 0.88 | | | | | | | |
| 2 Perceived Relatedness | 0.67 | 0.85 | | | | | | |
| 3 Emotional Support | 0.53 | 0.51 | 0.90 | | | | | |
| 4 Informational Support | 0.35 | 0.44 | 0.63 | 0.89 | | | | |
| 5 Trust (Benevolence) | 0.58 | 0.66 | 0.56 | 0.54 | 0.86 | | | |
| 6 Trust (Competence) | 0.67 | 0.64 | 0.47 | 0.48 | 0.60 | 0.90 | | |
| 7 Trust (Integrity) | 0.60 | 0.69 | 0.51 | 0.48 | 0.74 | 0.73 | 0.88 | |
| 8 Intention to Seek Health Information | 0.72 | 0.70 | 0.65 | 0.53 | 0.61 | 0.75 | 0.63 | 0.87 |

**Figure 2. Model Results**
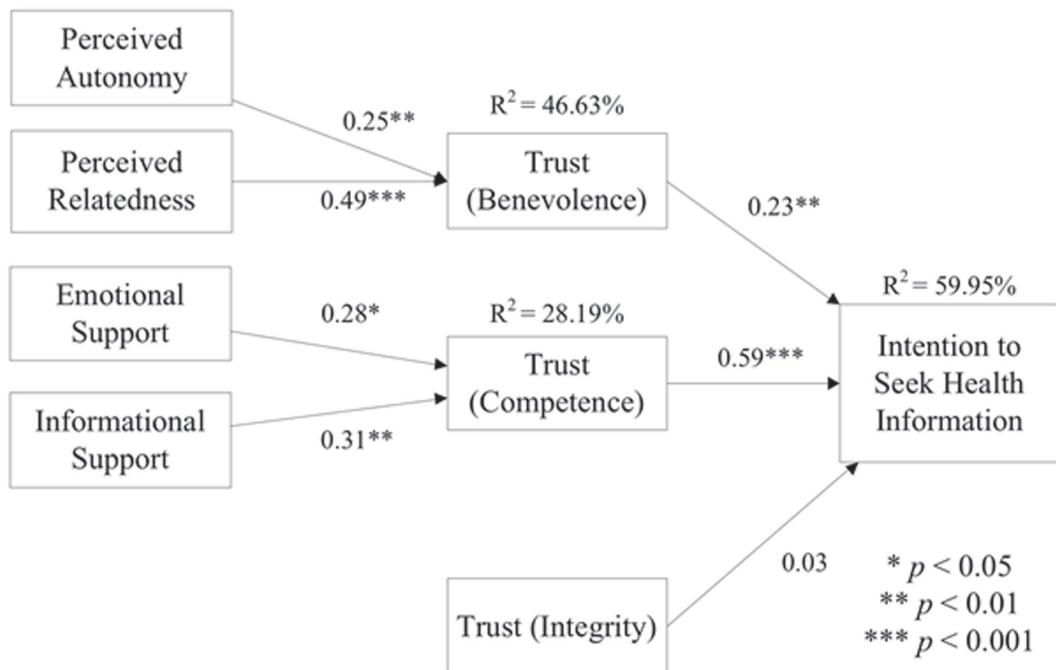


## DISCUSSIONS

This study examines the role of trust toward online health services in influencing individuals' intentions to seek health information on social media as well as how to promote their trust. Trust toward online health services is critically essential. If individuals do not trust health services on social media, they may not seek health information there, even if the information can be useful. The basic argument of this study is that when individuals trust health services on social media, they are more likely to search for health information on social media (H1). Further, we suggest that individuals' trust beliefs toward online health services can be supported. Specifically, we argue that individuals' benevolence trust beliefs can be enhanced by meeting their basic psychological needs (H2), and individuals' competence trust beliefs can be improved by providing social support (H3). Those hypotheses were tested with an Italian sample and are supported by the results.

## Implications to the Theory

Our study has several theoretical implications. First, our results show the importance of trust toward online health services in seeking online health information. Previous literature has highlighted the importance of trust on social media. For example, Liang et al. (2016) find that trust among members is positively related to knowledge sharing in online communities. Benlian and Hess (2011) show that system trust and inter-personal trust can positively influence individuals' participation in online communities. Focusing on users' continuance intention, Kourouthanassis et al. (2015) also find that a higher perception of trust toward social media can result in a higher level of SNS reuse.

Our study thus confirms the critical role of trust in the context of health services on social media. We expand previous literature by differentiating various dimensions of trust beliefs, and our results show that individual benevolence and competence trust beliefs are positively related to their intention to seek health information on social media, and three trust beliefs together explain 59.95 percent of the variance from intention. Further, previous literature on trust mainly focuses on individuals' initial trust beliefs (McKnight et al., 2002), and relatively few studies have examined individuals' trust beliefs after they have experiences of interaction. Therefore, our study extends previous literature by clarifying how individuals' ongoing trust beliefs can influence their future intention to seek online health information.

Besides, our study shows the relative importance of different trust beliefs. Specifically, our results show that competence trust beliefs have the strongest effect on individuals' intention to seek online health information. Competence trust beliefs reflect whether individuals perceive that the sites can provide relevant information and help solve their health-related issues. Therefore, individuals' perception of competence trust beliefs significantly decides whether the sites can help individuals achieve their purposes, which in turn influence their future intention to visit the sites and seek health information again. This result is consistent with McKnight et al. (2002)'s argument that individuals may online providers of medical information should be more concerned with individuals' beliefs about competence.

On the other hand, our results show that individuals' integrity trust beliefs are not significantly related to their intention to seek online health information (H1c not supported). One possible reason can be that today, the websites of online health service providers have matured, and their infrastructures have been operating smoothly. In such a context, individuals have no trouble accessing those sites, therefore they do not feel concerned about integrity trust. It would be interesting to examine whether the results still hold in other contexts, such as in developing countries where the technology infrastructure may not be well established.

Third, by applying SDT, our results show that when individuals' needs for autonomy and relatedness are satisfied (i.e., they have a higher level of perceived autonomy and relatedness), their benevolence trust beliefs toward health services can be improved. Those results further support SDT and show additional positive effects that can be generated in the context of online health services.

Lastly, our results also show that providing social support can enhance individuals' competence trust beliefs. Specifically, our results that in addition to information support, emotional support can also help improve individuals'' competence trust beliefs toward online health services. This result is consistent with Jones (2004)'s study, where the authors show that emotional support can increase individuals' perception of helpers' competence.

## Implications to the Practice

Our study also presents significant practical implications. Prior studies have indicated that peoples' trust of online health information is a major factor that influences their follow-up health information seeking, discussing and sharing activities (Lin, Zhang, Song & Omori, 2016). However, a considerable percentage of individuals still don't fully trust the health information from social media (Antheunis, Tates, & Nieboer, 2013). The results of this study show practitioners how trust beliefs toward online

health services can be improved. Here our research model provides useful guidance on how to enhance different trust beliefs.

Benevolence trust beliefs can be enhanced by increasing individuals' perceived autonomy and relatedness. Therefore, moderators or managers of social media should pay more attention to individuals' activities to satisfy their need for relatedness and autonomy. For example, moderators can set reminders so that when individuals ask questions about health, the moderators can be notified immediately and try to answer those questions as soon as possible. E-mail responses can also be sent so individuals know their questions have been answered. Flexible schedules also can be used so that moderators are available 24/7. Those initiatives can make individuals feel they are connected with and cared for by others in social media, satisfying their need for relatedness. Designers can also design social media such that individuals find it easy and comfortable to discuss their health issues with moderators, satisfying their need for autonomy. For instance, the sites can allow users to specify who can see their specific posts, such as moderators only, others, or everyone.

Additionally, to enhance competence trust beliefs moderators not only need to provide information required by users, they also need to encourage individuals to overcome their health issues. Providing needed health information without comforting individuals may not convince individuals that the sites provide good health advice and services. In such a context, individuals may still not trust the health services provided.

## LIMITATIONS AND OPPORTUNITIES FOR FUTURE STUDIES

Our study also has several limitations. First, our dataset comes from a survey conducted by SurveyCo from an Italian sample. While the company tries to recruit individuals from all age levels (as shown in Table 1), the sample can still be biased. Second, our results are still limited to the sample, and future studies are needed to examine whether our results hold for samples from other countries. Third, our study focuses on individuals' future intention, so the results may not hold for individuals' initial intention to search online health information.

Our hypothesis H1c is not supported, and integrity trust beliefs toward online health services do not seem to be an issue in health information seeking behaviors on social media. As discussed above, it is possible that because our sample is from Italy, the technology infrastructure is mature and the operation of social media is reliable. It would be interesting to examine whether the results hold in other countries where the technology infrastructure is less mature and reliable.

Our study examines the role of trust on the intention to seek health information and how to support different trust beliefs. Future studies can identify additional factors that support different trust beliefs as well as other factors that can influence individuals' intentions. Future studies can also examine how to encourage individuals to share health information and compare the effects of different factors on intention to seek vs. intention to share health information.

## CONCLUSION

Individuals have increasingly sought health information in social media. However, trust toward online health services is still among the biggest challenges in gaining greater acceptance. Drawn from previous literature on SDT, social support, and trust, this study investigates individuals' intentions to seek health-information on social media. We carefully selected a sample from Italy with subjects who already had experience in seeking health information on social media. The empirical results show that individual's trust beliefs have an important role in influencing individuals' health-information-seeking intentions on social media. Future studies are needed to further examine how to support individuals' trust beliefs in the context of online health services.

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## ENDNOTES

[1] In this study, we use trust toward online health services to refer to the degree to which individuals trust health information in social media. In other words, online health services in the context of this study refer to providing health information through social media. Please note that online health services can include other health-related services in other contexts.

[2] This focus is also consistent with SDT, which does not examine why individuals have motivation, but how to support individuals' motivation.

[3] Need for competence is defined as the desire to achieve optimally challenging tasks (Harter, 1978; White, 1963). According to SDT, individuals must be able to know if they have achieved the tasks and met their goals to feel competent. In this study, individuals seek health information and solve their health-related issues in social media. However, they may not know if the information indeed help solve their health-related issues because they usually do not have corresponding health expertise. Therefore, need for competence is not relevant for our study.

## APPENDIX

**Measurement**

| Perceived Autonomy (Ke & Zhang, 2010) | |
|---|---|
| Aut1 | I feel online health communities are places where I can freely express my thoughts. |
| Aut2 | In online health communities, I can freely express my thoughts. |
| Aut3 | I feel free to share my information in online health communities. |
| Aut4 | In my experience of online health communities, I feel free to say what I want to say. |
| Perceived Relatedness (Ke & Zhang, 2010) | |
| Rel1 | I really like the individuals I interact with in online health communities. |
| Rel2 | I get along with individuals I come into contact with in online health communities. |
| Rel3 | Individuals are generally pretty friendly towards me in online health communities. |
| Rel4 | The individuals I interact with regularly seem to like me much in online health communities. |
| Emotional Support (Hajli, 2014) | |
| ES1 | When faced with difficulties, some individuals on social media are on my side with me. |
| ES2 | When faced with difficulties, some individuals on social media comforted and encouraged me. |
| ES3 | When faced with difficulties, some individuals on social media expressed interest and concern in my well-being. |
| Informational Support (Hajli, 2014) | |
| IS1 | On social media, some individuals would offer suggestions when I needed help. |
| IS2 | When I encounter a problem, some individuals on social media would give me information to help me overcome the problem. |
| IS3 | When faced with difficulties, some individuals on social media would help me discover the cause and provide me with suggestions. |
| Benevolence Trust Beliefs (McKnight et al., 2002) | |
| TB1 | I believe that online health services would act in my best interest. |
| TB2 | If I required help, online health services would do their best to help me. |
| TB3 | Online health services are interested in my well-being, not just their own. |
| TB4 | Online health services are open and receptive to my needs. |
| Integrity Trust Beliefs (McKnight et al., 2002) | |
| TI1 | Online health services are truthful in their dealings with me. |
| TI2 | I would characterize online health services as honest. |
| TI3 | Online health services would keep their commitments. |
| TI4 | Online health services are sincere and genuine. |
| Competence Trust Beliefs (McKnight et al., 2002) | |
| TC1 | Online health services are competent and effective in providing health services. |
| TC2 | Online health services have the ability to meet most of my needs. |
| TC3 | Overall, online health services are capable and proficient health service provider. |
| TC4 | In general, online health services perform their role of providing health advice very well. |
| Intention to seek health information (Lin & Lu, 2011; Liang et al. 2011) | |
| SEE1 | I intend to keep seeking health information on social media in the future. |
| SEE2 | I intend to seek health information on social media frequently in the future. |
| SEE3 | I am willing to seek health information on social media. |
| SEE4 | I will seek related health information on social media when I need to. |
| SEE5 | I will consider others' health experience on social media before I make a decision regarding health. |
| SEE6 | I will ask others on social media to provide me with their suggestions before I make a decision regarding health. |

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