

Effect of barrier related factors on perceived usefulness and ease of use of social media applications in the Australian healthcare sector

Irfanuzzaman Khan

University of Canberra, Australia

Jennifer Loh

University of Canberra, Australia

Abu Saleh

University of Canberra, Australia

Ali Quazi

University of Canberra, Australia

Majharul Talukder

University of Canberra, Australia

majharul.talukder@canberra.edu.au

Abstract

Despite the growing popularity of social media internationally, an extant review of the literature revealed a low rate of social media usage among healthcare professionals. While cynicism amongst healthcare professionals might be a reason, there might be other factors that could explain healthcare professionals' reluctance to use social media in their practices. This research investigated potential barriers that affected healthcare professionals' behavioural intention to use social media. A cross-sectional survey was randomly administered to 824 healthcare professionals working in Australian healthcare organisations. At the end of data collection, 219 usable responses were collected. Analysis of data via structural equation model (SEM) found that perceived trust, privacy threats, professional boundary, facilitating conditions and self-efficacy significantly influence the notion of perceived usefulness and ease of use. In addition, information quality directly influences health professionals' perceived ease of utilising social media technology. The result also indicated that gender moderates the relationship between barrier-related factors and perceived usefulness and ease of use. This study's findings have important implications for healthcare providers and policymakers regarding medical professionals' perceptions of the potential challenges in using social media as well as developing strategies to counter misinformation against the backdrop of COVID-19.

Keywords: Social media, healthcare professional, privacy threat, trust, perceived usefulness, professional boundary

1 Introduction

Rapid advances in digital technologies and people's increasing online connectivity have revolutionised personal and social life to the point where social media is omnipresent in almost everything that people do (Fernández-Luque & Bau, 2015). Within healthcare communication, consumers now rely heavily on information found on social media sites which influences critical health decisions such as self-diagnosis, accessing peer support to manage chronic conditions, diet management and selecting health providers (Gagnon & Sabus, 2015). In doing so, social media facilitates patient empowerment by placing healthcare

consumers in a position to take control of their needs (Denecke et al., 2015). From the perspective of healthcare providers, social media offers an abundance of potential benefits. This includes better patient engagement and patient care, information-and knowledge-sharing, social support enhanced community outreach and improved quality of patient care (Barnes, Kaul, & Kudchadkar, 2019; Park, Bowling, Shaw, Li, & Chen, 2019). Public health agencies also frequently employ social media to supplement their existing health communications strategies (Lober & Flowers, 2011).

Prior studies have found that social media sites positively impact on patients' psychological well-being (Erfani, Abedin, & Blount, 2017). Furthermore, a social media presence can consolidate and promote healthcare providers' or a practitioner's brand and generate more business opportunities for them (Kotsenas et al., 2018a). Notwithstanding the inherent benefits of using social media for health communication, professional applications of social media in medical contexts are deemed to be complex, unregulated and is an informal mechanism of communication and information exchange (Moorhead et al., 2013). User interests drive the notion of health information exchange. Users can decide what content to share or ignore. This phenomenon is called consumer sovereignty in interactional communication processes (Kline, Dyer-Witheyford, & De Peuter, 2003) and is a concern to healthcare professionals because such an outlook may lead to serious consequences in terms of health outcomes (Househ, Borycki, & Kushniruk, 2014). For example, an assessment of 121 websites based on popular health topics disclosed that only 24% of the websites fulfilled more than two-thirds of published health guidelines for that health topic; 35% met between one and two-thirds, and 41% less than a third of the guidelines (Kunst, Groot, Latthe, Latthe, & Khan, 2002). Another study conducted on online support-seeking behaviour revealed that information provided through online support communities is often inaccurate due to the absence of a trained medical professional in the bulletin boards (Malik & Coulson, 2010). Consequently, many health professionals expressed concerns about the usefulness of social media in a healthcare setting (Smailhodzic, Hooijsma, Boonstra, & Langley, 2016) and thus, professional application of social media in healthcare remains limited.

1.1 Rationale of the research

Despite the advances being made by social media in healthcare, a lower rate of adoption by healthcare professionals points towards potential barriers which might prevent them from adopting social media in their practices (Usher et al., 2014). In addition, users' individual differences including age, gender and usage frequency also account for different barriers to social media adoption (Braun, 2013; Kamboj & Rahman, 2016; Salim, 2012). The extant social media acceptance studies in the healthcare context have not concentrated on the effects of these individual differences. Therefore, the barrier-related factors and moderators of social media adoption should be considered simultaneously. Thus, this research attempted to investigate the barrier-related factors and moderating effect of individual differences by answering the following the questions: (i) what are the barriers affecting healthcare professionals' use of social media in the healthcare domain; and (ii) are the moderating effect of age, gender, and social media usage frequency significant in health professionals' perceptions concerning the usefulness and ease of use of social media?

A deeper understanding of the barriers that stand in the way of health professionals adopting social media technologies offer insights for healthcare authorities to develop support mechanisms, strategies, procedures, and content of social media usage. The remainder of this

paper is organised in five sections. First a review of the literature research is provided. Then, the theoretical framework is proposed, and its key constructs are described. Following this the research methodology is outlined. In the next section, the results are presented through the hypothesis testing. The next section discusses the results and explains theoretical and practical implications. Finally, the last section contains the limitations and future research directions.

2 Review of the literature

There is a rich body of literature on the adoption of social media in information systems including the behavioural aspects of social media, information sharing mechanisms, marketing features, benefits, and risks of using social media in a variety of contexts (Ali-Hassan, Nevo, & Wade, 2015; M. Chau & Xu, 2012; Kapoor et al., 2018). A systematic review of studies published between 1995 and 2012 found two major themes that drive the adoption of social media: a customer-centric organisational culture and social networking site (SNS) know-how (Abedin, Abedin, Khoei, & Ghapanchi, 2013). Despite this, research within the SNS know-how in the healthcare domain remains scarce. According to MacLure and Stewart (2016), this is due to a lack of digital literacy among Australian, Canadian, and American healthcare professionals. Indeed, a cross-sectional study involving 500 healthcare professionals found that 81.1% of these healthcare professionals exhibited inadequate computer knowledge (Alwan, Ayele, & Tilahun, 2015). This finding was also documented in a recent study of 407 Australian healthcare workers who reported anxiety about using information systems (Kuek & Hakkennes, 2020). Importantly, researchers have discovered that in the healthcare profession, many healthcare providers tend to perceive patients who seek online information to be misinformed and anxious (Moick & Terlutter, 2012; van Uden-Kraan et al., 2010). Consequently, many healthcare professionals believe that they should actively counter this indiscriminate spread of misinformation from social media (Kouzy et al., 2020).

While much research has been conducted on healthcare consumers' adoption of social media to access medical information, current research in healthcare has tended to focus mainly on social media usage patterns (Antheunis, Tates, & Nieboer, 2013), features (Grajales III, Sheps, Ho, Novak-Lauscher, & Eysenbach, 2014), utility (Panahi, Watson, & Partridge, 2016), and possible limitations (Devine, 2017). Empirical studies are lacking on how medical professionals adopt and utilise social media or information technology in their medical practices (Archambault et al., 2012; Lau, 2011; McGowan et al., 2012). Therefore, more research is required to understand healthcare professionals' perspectives on social media. Moreover, existing technology adoption frameworks are inadequate in explaining the impact of barrier-related factors on health professionals' intention to use social media. The following section clarifies the theoretical framework adopted in this study and discusses the Technology Acceptance Model (TAM) in detail.

2.1 Research model

Technology adoption research relies on various mainstream adoption models such as the theory of reasoned action (TRA), technology acceptance model (TAM) and unified theory of acceptance and use of technology (UTAUT) to explain the adoption and implementation of new technologies and systems. These traditional models basically focus on outcome expectations in terms of whether a certain technology or system improves job performance (Ajibade, 2018). In contrast, alternative theories such as capability approach (CA) centre around the notion of non-utilitarianism. CA posits that expected outcomes should go beyond

job performance or performance more generally as specified in classic technology adoption models (Nikou, Agahari, Keijzer-Broers, & de Reuver, 2019). It is explicitly assumed by CA that availability of resources, such as digital technologies, does not inevitably lead to good outcomes. Rather, availability of resources and capabilities effectively give individuals the freedom to choose whether they want to realise these opportunities or not (Talaie-Khoei, Lewis, Khoei, Ghapanchi, & Vichitvanichphong, 2015). However, the CA approach was specifically constructed for the domain of wellbeing and independent living (Robeyns, 2005), hence, its generalisability and explanatory power in the context of professional use social media is questionable. Therefore, the TAM emerges as a logical choice when conducting an analysis of social media adoption.

According to the TAM, there are two determinants of technology acceptance: perceived usefulness (PU) and perceived ease of use (PEOU) of a technology (Davis, Bagozzi, & Warshaw, 1989). PU refers to the extent a user believes that using a particular system will improve how they perform or execute a certain task. PEOU refers to the extent a potential user believes that use of a particular system would be free of effort (Davis et al., 1989). PU and PEOU influence users' intention to use a specific technology. Sequentially, intentions to use it will determine the actual use of the system.

Prior studies concerning information system (IS) and information technology (IT) adoption have tended to consider PU as the most important determinant of an individual's decision to embrace a new technology (Abdullah, Ward, & Ahmed, 2016; Kucukusta, Law, Besbes, & Legohérel, 2015). Furthermore, users are equally likely to adopt a new technology if they perceive that it is easy to use and in using it will free up their time to do other things (Morosan, 2012). Therefore, it is important to elucidate the determinants of these two factors (PE & PEOU) in the context of social media. Indeed, most social media-related studies in healthcare have relied heavily on either a generic survey of medical professionals or descriptive studies without a solid theoretical foundation (Fisher & Clayton, 2012; McGowan et al., 2012). This research attempts to fill the theoretical lacuna in this field.

Recent research indicates that privacy, compatibility, information quality, lack of understanding of the benefits of social media, lack of organisational support and trust are some of most important obstacles that influence health professionals' adoption of social media for health communication (Cain, 2011; Chou, Hunt, Beckjord, Moser, & Hesse, 2009; Househ et al., 2014; Moorhead et al., 2013). Consequently, the proposed framework (see Figure 1) contextualises TAM by adding barrier-related factors: information quality, perceived threat, professional boundary, facilitating conditions, self-efficacy, and perceived trust from the perspective of health professionals. The proposed model explains how these barriers might influence healthcare professionals' perceived usefulness (PU), perceived ease of use (PEOU) and their behavioural intention to use social media when communicating with clients.

The proposed model also considers the moderating effects of age, gender, and social media usage frequency on the relationship between barrier-related factors and the notion of PU and PEOU. Figure 1 below illustrates the proposed healthcare social media acceptance model.

2.2 Hypothesis Development

2.2.1 Information quality

Information quality is a complex construct, and the term is often used interchangeably with data quality. In information system research, there is a predisposition to apply data quality to

sync with the best interests of health consumers. Moreover, trust can reduce uncertainties associated with an online experience which is related to ease of use (Pavlou, 2003). Therefore, trust is a critical element of online health services usage because it facilitates a feeling of security and individuals sense that social media can be trusted when exchanging health-related information. Based on TAM, the following hypotheses are proposed:

H3: Perceived trust is associated with the PU.

H4: Perceived trust is associated with the PEOU.

2.2.3 Privacy threat

Privacy and confidentiality concerns constitute a major deterrent of social media usage in the healthcare industry (Al-Muhtadi, Shahzad, Saleem, Jameel, & Orgun, 2019). From an individual perspective, a threat to privacy can be defined as a “sense of anxiety regarding one’s personal privacy” (Lanier & Saini, 2008). In the field of IT and IS, privacy threats have received much attention from researchers. Prior studies have investigated the impact of privacy threats on consumers’ online purchase intention and behaviours (Pavlou, Liang, & Xue, 2007) and social media usage behaviour (Adhikari & Panda, 2018). Thus, privacy threat is considered to be an important construct in the technology acceptance decision (Brandyberry, Li, & Lin, 2010). Recent analyses regarding generic use of social networking sites (SNS) have shown that privacy threat is negatively related with PU and PEOU (Buettner, 2015). Moreover, higher PU and PEOU potentially outweigh people’s privacy concerns (Awad & Krishnan, 2006). Considering the growing popularity of social media in the healthcare sector, it will be interesting to see how privacy threats influence health professionals’ perceptions of usefulness (PU) and perceived ease of use (PEOU). Based on past empirical evidence, the following hypotheses are postulated:

H5: Privacy threat is negatively associated with health professionals’ PU.

H6: Privacy threat is negatively associated with health professionals’ PEOU.

2.2.4 Professional boundary

Professionalism has been a topic discussed at length and in many contexts in the medical education literature (Chretien & Kind, 2013). Social networking has created an imbalance in doctor-patient relational boundary issues (Gholami-Kordkheili, Wild, & Strech, 2013). Boundary crossing and boundary violation is now a common phenomenon between patient and their doctor, for instance, when a doctor discloses a patient’s private information in a publicly open forum. Importantly, the digital world may blur the personal and professional lives of health professionals (Farnan et al., 2013). How health professionals and consumers represent themselves in the social media realm has also become a critical issue. As patients become increasingly web savvy, they have found new ways to access their physicians, and the success of social media platforms in augmenting patients’ experience depends mostly on how such issues are addressed (Chretien & Kind, 2013).

The notion of professional boundary is still to be analysed as an independent variable in the current technology adoption model. Previous studies have shown that when a user perceives a new system or technology to be inconsistent with his/her current professional practice, he/she will tend to be more uncertain about the expected benefits of the innovation (Al-Qirim, 2007; Conway, Cao, & Hong, 2011; Rogers, 2003). However, the impact of perceived boundary on PU and PEOU is unclear in the healthcare social media domain. More empirical

investigation is needed to ascertain the relationship between perceived boundary and the notion of PU and PEOU. Thus, the following hypotheses are proposed:

H7: Greater awareness of professional boundary positively influences the notion of PU.

H8: Greater awareness of professional boundary positively influences the notion of PEOU.

2.2.5 Facilitating conditions

In this research, facilitating conditions refer to the availability of organisational support to facilitate a new system or technology use (Thompson, Higgins, & Howell, 1991). Extant literature has identified various factors such as time constraints, limited provision of workplace support and limited training as barriers to social media adoption in healthcare settings (Moorhead et al., 2013). For example, in a study of paediatric physicians' attitudes in using social media platforms to improve asthma management in adolescents, it was reported that despite the benefits of social networking sites, the additional time required to monitor the sites was a significant barrier concerning the use of social media (Martinasek et al., 2011). The study indicated that daily workplace schedules were already overwhelming, and it was challenging for physicians or their staff to find the time for these added responsibilities. According to Triandis' model of interpersonal behaviour, when barriers are present, behaviours are less likely to arise even with high levels of intention (Triandis, 1979). Thus, the absence or presence of facilitating conditions can trigger a positive or negative perception of usefulness (Peñarroja, Sánchez, Gamero, Orengo, & Zornoza, 2019) and perceived ease of use (Venkatesh, 2000). Thus, the following hypotheses are proposed:

H9: Supporting conditions positively influence the PU.

H10: Supporting conditions positively influence the PEOU.

2.2.6 Self-Efficacy

Self-efficacy refers to one's belief concerning his/her ability to undertake and complete a certain task using IT/IS systems (Compeau & Higgins, 1995). Existing literature indicates that certain healthcare professionals' reluctance to use social media is due to the lack of required skills and experience in using online tools (Adzharuddin & Ramly, 2015; Eschenbrenner & Nah, 2015). Self-efficacious individuals behave more socially and are more likely to engage in online information exchange than less self-efficacious individuals and they are influenced by other people's input (Hocevar, Flanagan, & Metzger, 2014). Earlier studies primarily addressed the internet user's self-efficacy (Hsu & Chiu, 2004). Past studies point towards a causal flow from computer self-efficacy to system-specific perceived ease of use (Venkatesh & Davis, 1996) and perceived usefulness (Liaw & Huang, 2013). It is important to note that studies on health professionals' social media self-efficacy are relatively scarce. Thus, further empirical investigation of the relationship between social media self-efficacy and PU/PEOU is warranted. Based on the above argument, the following hypotheses are posited:

H11: Social media self-efficacy is significantly associated with health professionals' PU of social media usage.

H12: Social media self-efficacy is significantly associated with health professionals' PEOU of social media.

2.2.7 Behavioural intention

Based on TAM, PU and PEOU are expected to positively influence behavioural intention to use a technology (Davis, 1989). Prior technology acceptance studies have revealed that perceived usefulness and perceived ease of use are significant predictors of intention to use information technology (Chang, Hwang, Hung, & Li, 2007; Holden & Karsh, 2010; Yarbrough & Smith, 2007). For example, Chang et al. (2007) have shown that performance expectancy, which is similar to perceived usefulness, influences physicians' intention to use the clinical decision support system. It will be interesting to see the effect of PU and PEOU on health professionals' behavioural intention to use social media for communication purposes. Based on TAM, the following hypotheses are proposed:

H13: PU positively influences health professionals' intention to use social media.

H14: PEOU positively influences health professionals' intention to use social media.

A summary of the root constructs, their definitions and sources are provided in Table1.

Construct/Sources	Definition	Source
Information quality	Refers to completeness, ease of understanding, personalisation, relevance and security of web-based content.	Delone & McLean, 2003
Perceived trust	An expectation that others are trusted not to behave in an opportunistic manner by taking advantage of the situation.	Gefen et al., 2003
Professional boundary	When professionals refrain from communicating and sharing knowledge with outsiders due to political, ethical and professional reasons.	Farnan et al., 2009; Farnan et al., 2013; Teigland & Wasko, 2003
Privacy threat	The threat that violates the right to determine what personal information about an individual should be known by others.	Westin & Review, 1968
Supporting conditions	Availability of required conditions to perform a specific task.	Venkatesh, Thong, & Xu, 2012
Self-efficacy	An individual's beliefs about his/her abilities to perform at a level that influences events in their lives.	Bandura, 1977
Perceived usefulness (PU)	The extent to which a person believes that using the system will enhance his/her job performance.	Davis, 1989
Perceived ease of use (PEOU)	The extent to which a potential user expects that the target system will be free of unproductive effort.	Davis, 1989
Behavioural intention	Refers to the degree a user intends to use one or more system features to complete a particular task.	Burton-Jones & Straub Jr, 2006

Table 1. Root constructs, definitions and sources

2.3 Moderating effect of Age, Gender and Usage frequency

Prior studies highlighted the moderating effect of age, gender, and experience on the relationship between dependent and independent variables. For example, Venkatesh and Davis (2000) found that age, gender, and experience moderate the relationship between situation constraints (e.g., performance expectancy, effort expectancy, social influence, facilitating conditions) and intention to use technology. Building on the work of Venkatesh and Davis (2000), the proposed model also considered the moderating effect of gender, age, and social media usage frequency on the relationship between barrier-related factors and the PU and PEOU.

Gender is one of the most widely acknowledged individual difference variables which denotes the difference between men and women in terms of their beliefs and attitudes regarding technology adoption (Venkatesh, Sykes, & Zhang, 2011; Zhang, Guo, Lai, Guo, & Li, 2014a), of which health technology is a part. Technology adoption research indicates that gender is strongly associated with the adoption and use of various health technologies (Hoque, Bao, & Sorwar, 2017; Zhang, Guo, Lai, Guo, & Li, 2014b). According to Zhou, Jin, and Fang (2014), PU is more salient for male users when they make decisions concerning technology usage, as it is consistent with their technology affordances and need structure. However, the role of gender has not been investigated in the social media domain, specifically in the context of health professionals. Thus, the following hypothesis is proposed.

H15: The gender effects in the healthcare social media acceptance model will be significant among health professionals.

Prior studies have shown that age is a vital factor for technological acceptance. Older people are relatively reluctant to adopt new technologies compared to younger people (Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014). Prior research has shown that different age groups have a specific moderating influence on whether mobile health services are adopted (Zhao, Ni, & Zhou, 2018). This study propose that these assumptions are still true among medical professionals. Therefore, consistent with prior studies, this article assume that younger medical professionals are more likely to use social media tools and will perceive a greater usefulness of social media in healthcare. This research considered the moderating role of age to examine the differences between the subgroups concerning social media usage behaviour (i.e., younger and older). Thus, we propose the following hypothesis:

H16: The age effects in the healthcare social media acceptance model will be significant among health professionals.

The underlying principle behind the use of frequency as a moderator is anchored in the unified theory of acceptance and use of technology model (UTAUT). According to UTAUT, experience in using certain systems reduces anxiety and any problems associated with the new system will dissipate (Venkatesh & Davis, 2000). Therefore, this research argues that usage frequency will reduce any problems associated with social media adoption. Consequently, frequent users are more likely to accept social media. This research proposes that frequency of social media usage will yield significant differences in the factors that are proposed in the conceptual model:

H17: The usage frequency effects in the healthcare social media acceptance model will be significant among healthcare professionals.

3 Research Methodology

Researchers have used qualitative research to explore the benefits and challenges in using social media from the perspective of healthcare professionals (Panahi et al., 2016; Rolls, Hansen, Jackson, & Elliott, 2016). However, less research has been conducted using quantitative research. A Google search returned only three studies that applied TAM-based frameworks to understand predictors of social media adoption behaviours in healthcare (Hanson, West, Thackeray, Barnes, & Downey, 2014; Jo, Song, & Kim, 2017; McGowan et al., 2012). These studies primarily focused on the drivers of social media adoption and showed that PU and PEOU is the most critical predictor of behavioural intentions to use social media in healthcare. Previous models have not considered the impact of barrier-related factors that might hinder healthcare professionals' PU and PEOU regarding their use of social media in their practices. The proposed conceptual model exclusively focuses on providing a holistic theoretical framework that clearly elucidates the barriers of social media acceptance in healthcare. Moreover, this research considers the moderating effect of age, gender and usage frequency which was not considered in prior studies in the Australian context. Logically, a quantitative survey was conducted to capture the effect of barriers related to health professionals' PU and PEOU.

3.1 Data Collection

A simple random sampling method was employed to select the respondents. A sampling frame was developed from publicly available online databases using Health Directory and Doctors4You website. Healthcare blogs and various health-related social media sites were also considered while developing the database. Subsequently, an invitation via email and traditional post was sent to solicit health professionals' participation. In total, 824 health professionals responded and agreed to participate in the research. The survey instrument consisted of the factors that influence PU, PEOU and behavioural intention of healthcare professionals in adopting social media use in their practices. A structured questionnaire was designed to incorporate operational measures of the variables so that it could be self-administered. A Survey Monkey link with the questionnaire was sent to those people who agreed to participate in this survey. A total of 219 completed responses were received over a period of six weeks. The response rate was 27%. Details of the construct measures and their operational indicators are provided in Table 2.

Measure	Sources Measures based on	Indicators	Standard Estimate
Privacy threat ($\alpha = .72$, AVE = .52)	Measures based on Bhattacharjee & Hikmet, 2007; Cheng, Lam, & Yeung, 2006; Duyck et al., 2008	Hard to maintain confidentiality Might compromise privacy There are legal implications	.864 .572 .628
Information quality ($\alpha = .85$, AVE = .69)	DeLone & McLean, 1992	Health information is presented well Information provided by social media sites is reliable Easy to understand Provides accurate information	.691 .914 .879 .768
Perceived trust ($\alpha = .85$, AVE = .68)	Gefen et al., 2003	I trust social media for health communication Healthcare social media sites are trustworthy Can be trusted to communicate health wellbeing	.940 .833 .833

Professional boundary ($\alpha = .88$, AVE = .79)	Moore & Benbasat, 199)	I am aware that social media fits well with the way I like to interact with patients	.834
		I understand that social media is compatible with my profession	.914
		Social media aligns with my professional integrity	.915
Facilitating conditions ($\alpha = .80$, AVE = .59)	Chau & Hu, 2002	Enables me to participate actively in health communities	.707
		Can reach other physicians/health professionals	.737
		Workplace environment encourages me to use social media	.879
Self-efficacy ($\alpha = .89$, AVE = .82)	Compeau & Higgins, 1995	Confident about using social media	.962
		Possesses required skills to use social media	.947
		I have no difficulty in using social media	.960
		I am interested in using social media to seek health information	.960
Perceived usefulness ($\alpha = .86$, AVE = .69)	Davis et al. 1989	Social media enables me to communicate better with patients	.851
		Improves quality of patient care	.749
		Increase knowledge sharing	.659
Perceived ease of use ($\alpha = .89$, AVE = .82)	Compeau & Higgins, 1995)	Easy to operate social media	.849
		Easy to become skilful	.775
		Flexible	.724
		I am interested in using social media to seek health information	.711
Behavioural intention ($\alpha = .82$, AVE = .76)	Davis et al., 1989	Use social media to share medical knowledge with patients.	.838
		Use social media to share medical knowledge with colleagues	.871
		I seek specific information about health-related issues	.874
		I use social media to promote myself as a health professional	.881

Table 2. Construct measures

3.2 Reliability and Validity

Table 2 shows that all composite reliabilities exceeded the required criterion of 0.70 (Hair, Black, Babin, Anderson, & Tatham, 2006). It also reveals that the average variance extracted (AVE) for each construct exceeds the recommended limit of 0.50 (Fornell & Larcker, 1981). All constructs are considered satisfactory since the factor loadings and reliability are at an acceptable level. All constructs are retained for confirmatory analysis and all results strongly suggest the instrument's convergent validity. During the assessment of multicollinearity, the correlation matrix (Table 3) showed no multicollinearity between any two items was above 0.8; thus, bivariate high collinearity did not exist. Construct correlations were compared with the square root of the AVE, and it was found that all square roots of the AVEs were consistently higher than the correlations between constructs. In this way the discriminant validity of the constructs used in this research has been confirmed.

	1	2	3	4	5	6	7	8
1. Information quality	1							
2. Privacy threat	.284**	1						
3. Perceived trust	.499**	.242**	1					

4. Professional boundary	.467**	.048*	.499**	1				
5. Facilitating condition	.149*	.111	-.099	.011	1			
6. Self-efficacy	.254**	.225**	.441**	.330**	-.160*	1		
7. Perceived usefulness	.050	-.427**	.248**	.335**	-.009	.203**	1	
8 Perceived ease of use	.498**	.340	.349**	.483**	-.078	.456**	.023	
9. Behavioural intention	.364**	.099	.354**	.591**	-.122	.314**	.123*	1

Table 3. Bivariate correlations

4 Findings

4.1 The demographic profiles

Table 4 below summarises participating healthcare professionals' demographic information. The completed survey includes 48% male participants and 52% female participants. Regarding the participants' age range, 47% were in the 18-49 age bracket, and 53% were over 50 years of age. Regarding the participants' experience in healthcare, 48% had 16-30 years, 14% had 11-15 years, 20% had 6-10 years, and 12% had 1-5 years. The majority of respondents are from New South Wales (47%) followed by the Australian Capital Territory (37%). Meanwhile 11% of participants are from Queensland and 5% are located in Victoria.

Categories	Criteria	Frequency	Percent
Age	18-49	102	47%
	50+	114	53%
Gender	Male	106	48%
	Female	113	52%
Clinical Experience	1-5 years	27	12%
	6-10 years	47	22%
	11-15 years	31	14%
	16-30 years	105	48%
	30 years or more	9	4%
Location	NSW	104	47%
	ACT	80	37%
	Queensland	23	11%
	Victoria	12	5%
	Total	219	100.0

Table 4. Demographic characteristics

4.2 Social media usage pattern

Table 5 summarises the patterns of social media used by the health professionals in this study. The results show that 63% have identified themselves as frequent users, while 37% are infrequent users.

Type	Frequency	Percent
Frequent user	138	63%

Infrequent user	81	37%
-----------------	----	-----

Table 5. Health professionals' social media usage frequency

Table 6 depicts the patterns of social media use by health professionals. The result indicates that Facebook, YouTube, Twitter, and LinkedIn are the most popular social media applications. Facebook is the most frequently used platform as 47% regularly access it. YouTube is the second most popular platform among health professionals (45%). This is followed by 25% of respondents frequently using Twitter while 21% of respondents access LinkedIn. Only 8% use blog sites and only 9% of respondents regularly access physician-only networks, and only 6% of respondents are users of WIKI sites. These findings are comparable with the overall social media user statistics in Australia. Approximately 80% of people in Australia are active on Facebook and YouTube. LinkedIn and Twitter are ranked 5 and 8, respectively, in terms of the total number of active users (CivicWebMedia, 2021). It is noticeable that health professionals' participation in physician-only networking sites and blogging platforms is particularly low. However, this is comparable with the Usher's (2011) study which showed that only 10% (N=231) of health professionals in Australia regularly use blogs for professional or personal use.

Type	Social media Use
Facebook	102/47%
Twitter	55/25%
Instagram	9/4%
YouTube	98/45%
Blogs	17/8%
LinkedIn	47/21.4%
WIKI	14/6.4%
Physicians-only networks	19/8.8%

Table 6. Health professionals' social media usage pattern.

4.3 Results of Confirmatory Factor Analysis (CFA) and Hypotheses Testing

The individual measurement model fit was tested for all dependent and independent variables included in the conceptual framework. The measurement model was tested with 31 items during the confirmation of measurement stage. The results of final CFA demonstrate good model fit ($\chi^2 = 826.609$; $df, 395$, $\chi^2/df = 2.093$, $RMSEA = .06$, $IFI = .918$, $TLI = .902$, and $CFI = .917$). Following the assessment of the measurement model, the subsequent phase assessed the structure equation model (SEM) to test the hypothesised relationships specified in the final conceptual framework.

The results of SEM specified the relationships between constructs and measured variables based on the theoretical or conceptual framework (Hair et al., 2006). The SEM analysis indicated a satisfactory model fit ($\chi^2 = 864.344$; $df, 402$, $\chi^2/df = 2.150$, $RMSEA = .06$, $IFI = .912$, $TLI = .897$, and $CFI = .912$). The structural model revealed that out of fourteen (14) hypotheses, 10 were supported were supported by the relationships at the $p < .01$ and $p < .05$ significance level (see Table 7).

The findings (see Table 7) reveal that the six proposed barrier-related constructs had significant effects on PU or PEOU. The findings show that the relationships between information quality and PEOU ($\beta=.838, t=4.502, p<.01$), perceived trust and PU ($\beta=.326, t=3.368, p<.01$), privacy threat and PU ($\beta=-.537, t=-6.126, p<.01$), professional boundary and PU ($\beta=.204, t=1.964, p<.05$), professional boundary and PEOU ($\beta=.718, t=6.122, p<.01$), facilitating conditions and PU ($\beta=.484, t=1.997, p<.05$), self-efficacy and PU ($\beta=.210, t=3.200, p<.01$), self-efficacy and PEOU ($\beta=.275, t=3.937, p<.01$), PU and behavioural intention ($\beta=.142, t=2.241, p<.05$), and PEOU and behavioural intention ($\beta=.377, t=7.999, p<.01$) were statistically significant, confirming support for H2, H3, H5, H7, H8, H9, H11, H12, H13 and H14 (see Table 7). However, the relationship between information quality and PU ($\beta=-.170, t=-1.029, p>.05$) was statistically insignificant (H1). The relationships between trust and PEOU ($\beta=-.399, t=-3.795, p>.01$), facilitating conditions and PEOU ($\beta=-.791, t=-2.969, p>.01$) were significant and negative. Moreover, the relationship between privacy threat and PEOU ($\beta=.294, t=4.007, p>.01$) was statistically significant and positive. Thus, H1, H4, H6 and H10 were not supported. Table 7 below provides an overview of the results of the hypotheses testing performed in SEM. The results for H15, H16, and H17 will be discussed in section 5.2

Hypothesis		Path coefficient (β)	S.E.	t	p	Comment	
H1: Information quality	→	Perceived usefulness	-.170	.165	-1.029	.303	Not supported
H2: Information quality	→	Perceived ease of use	.838	.186	4.502	***	Supported
H3: Perceived trust	→	Perceived usefulness	.326	.097	3.368	***	Supported
H4: Perceived trust	→	Perceived ease of use	-.399	.105	-3.795	***	Negative relationship
H5: Privacy threat	→	Perceived usefulness	-.537	.088	-6.126	***	Supported
H6: Privacy threat	→	Perceived ease of use	.294	.073	4.007	***	Positive Relationship
H7: Professional boundary	→	Perceived usefulness	.204	.104	1.964	.049	Supported
H8: Professional boundary	→	Perceived ease of use	.718	.117	6.122	***	Supported
H9: Facilitating conditions	→	Perceived usefulness	.484	.243	1.997	.046	Supported
H10: Facilitating conditions	→	Perceived ease of use	-.791	.266	2.969	-.003	Negative relationship
H11: Self-efficacy	→	Perceived usefulness	.210	.066	3.200	.001	Supported
H12: Self-efficacy	→	Perceived ease of use	.275	.070	3.937	***	Supported
H13: Perceived usefulness	→	Behavioural intention	.142	.063	2.241	.025	Supported
H14: Perceived ease of use	→	Behavioural intention	.377	.047	7.999	***	Supported

Table 7. Results with reference to the hypotheses

5. Discussion

The first research question of this study was: what are the barriers affecting the healthcare professionals' use of social media? The extant literature pointed toward six (6) barrier-related factors impacting the notion of PU and PEOU. In this section, findings with respect to the first research question have been discussed. Subsequently, the answer to the second research question concerning the moderating effect of age, gender and social media usage frequency is discussed. Finally, theoretical and practical implications are presented.

5.1 Impact of barrier-related factors

5.1.1 Information quality

The relationship between information quality and PU was insignificant. This finding contradicted prior research which has found that perceived information quality positively influences the notion of PU in digital information exchange settings (Machdar, 2019; Saeed & Abdinnour-Helm, 2008). Results indicated that information quality may not be a critical determinant of health professionals' perception of usefulness. It can be argued that information quality is a more important determinant for health consumers or patients than the healthcare professionals. This is because patients tend to rely heavily on social media based medical information than the healthcare professionals (Antheunis, Tates, & Nieboer, 2013). However, the relationship between PEOU and information quality was particularly strong, which implies that higher quality social media content reduces the effort required to use social media in healthcare settings.

5.1.2 Perceived trust

This study also set out to examine the impact of perceived trust on PU and PEOU. The results demonstrated that perceived trust yielded a significant influence on PU. This outcome was consistent with previous studies (Lin, Zhang, Song, & Omori, 2016; Mou, Shin, & Cohen, 2017; Van Der Velden & El Emam, 2013) and confirms that trust minimises uncertainties associated with disseminating private and sensitive health information. In other words, trust is a critical element of online health services (Bansal & Gefen, 2010). If online participants fail to trust the health information provided to them through social media channels, their uncertainty would be high which would impact their mental representation regarding the usefulness of social media. Moreover, health professionals are likely to perceive the potential for benefit only if they trust social media to disseminate information correctly. However, the relationship between perceived trust and PEOU was found to be negative. The result contradicts previous findings which showed there is a significant association between trust and PEOU in predicting consumers' use of social media for transactions (Hansen, Saridakis, & Benson, 2018). Thus, perceived trust may not be a strong predictor of PEOU in the healthcare context.

5.1.3 Privacy threat

In terms of H5, results confirm that privacy threat negatively influences PU and positively influence PEOU. Thus, privacy threat reduces health professionals' perceptions of usefulness in social media-based healthcare settings. This finding is consistent with previous research finding that privacy threat is one of the fundamental barriers to health professionals' use of social media which has a significant impact on their perception of usefulness (Moorhead et al., 2013). However, privacy threat was found to be positively related to PEOU. Prior studies have shown that PEOU typically serves as a risk reduction factor and lessens privacy-related risks (Featherman, Miyazaki, & Sprott, 2010; Pavlou & Gefen, 2004). However, this study

contradicts prior findings and claims that high privacy threat does not necessarily point to low PEOU. Consequently, privacy threats do not negatively influence PEOU.

5.1.4 Professional boundary

This study also examined the relationship between professional boundary and PU (H7) and PEOU (H8). The finding confirms there is a significant association between professional boundary and PU and PEOU. This finding suggests that awareness of professional boundaries results in a favourable perception concerning PU and PEOU in healthcare social media settings. The findings lead to the insight that social media use by physicians for clinical and non-clinical purposes poses some dilemmas in terms of patients' and health professionals' interactions. Specifically, any inappropriate use of social media can result in harm to patients and the profession, including breaches of confidentiality, defamation of colleagues or employers, and violation of doctor-patient boundaries (Kotsenas et al., 2018b). Consequently, lack of knowledge about the professional boundary can greatly influence health professionals' social media usage decision. The concept of professional boundaries in the healthcare social media context is not widely known or understood, and the role of professional boundaries as an independent variable has not been addressed in the literature. To the best of the authors' knowledge, this is the first study to include professional boundary as a predictor.

5.1.5 Facilitating Conditions

Regarding H9, facilitating conditions had a significant influence on PU. This result is consistent with prior studies in different contexts (for example, learning) which reported a positive effect of facilitating conditions on PU (Teo, 2011). This finding implies that when end-users feel supported in their technological adoption, they tend to perceive that the new system is useful to them. Thus, the finding of the study affirm that organisational support would encourage healthcare professionals to use social media for professional reasons. However, the relationship between facilitating conditions and PEOU was significant (H10) but negative. One possible explanation could be that the ubiquitous nature of social media which allow individuals to freely interact with others and the role of facilitating conditions are negligible. Thus, facilitating conditions may not be a strong predictor of PEOU.

5.1.6 Self-efficacy

The result indicated a significant relationship between self-efficacy and PU (H11) and PEOU (H12). Previous studies have found mixed results concerning the effect of self-efficacy on PU. Some studies reported a positive relationship (Al-Ammary, Al-Sherooqi, & Al-Sherooqi, 2014; Al-Mushasha, 2013), whereas others reported the lack of a significant relationship between self-efficacy and PU & PEOU (Lee, Hsieh, & Chen, 2013). However, this research confirms that if health professionals are efficacious in their use of social media, they are more likely perceive it as useful and will find it easy to use in their work.

5.1.7 Behavioural Intention

Finally, both PU and PEOU significantly influence the notion of behavioural intention to use social media for health-related communication. The finding confirms the idea that PU and PEOU are key predictors of health professionals' intention to use social media in healthcare settings.

5.2 Moderating effect of Age, Gender and Usage frequency

Drawing on the recommendations of Steenkamp and Baumgartner (2000), measurement invariance tests were conducted to verify the statistical concern and validate the proposed theoretical constructs and their suitability for different groups such as Gender (Male-Female), Age (Young adults – Mature adults), and usage frequency (Frequent user - Non-frequent user). Furthermore, structural invariance including χ^2 difference tests have been conducted to verify the moderating effect of these variables.

Gender Moderation	χ^2 Value	df	χ^2 difference	RMSEA	IFI	TLI	CFI	χ^2/DF
Male-female								
Model 1: Structural Invariance (Constrained – Unconstrained)	1795.92 – 1709.51	842 - 808	CMIN=86.41 Df=34 p=.001	0.073	0.847	0.820	0.843	2.12
Usage frequency moderation: Frequent and non-frequent								
Model 2: Structural Invariance (Constrained – Unconstrained)	1308.64 – 1276.39	841 - 806	CMIN=32.26 Df=16 p=.404	0.066	0.868	0.842	0.863	1.58
Age Moderation: Young-old user								
Model 3: Structural Invariance (Constrained – Unconstrained)	1410.42 – 1377.50	843 - 810	CMIN=32.92 Df=33 p=.471	0.057	0.895	0.876	0.892	1.70

Table 8. Moderating Effect: Structural Invariance

As evidenced in Table 8, Model 1 demonstrates a reasonable fit and provides evidence there is a significant difference between gender group samples, confirming H15. However, the other two groups - usage frequency and age of consumers – did not demonstrate significant differences. Therefore, H16 and H17 were not supported. Thus, the only significant difference is found in gender at the .001 level. This implies that male and female professionals' observations regarding predictors and their influence on criterion variables are different. Path by path analysis reveals that the effect of PU and PEOU on behavioural intention to use social media is significant among women health professionals, whereas PU does not ($p > .05$) affect behavioural intention for men health professionals. These findings challenge the traditional perspective that perceived usefulness plays a more significant role for men than women when they are making decisions about technology usage (Zhou et al., 2014). Another interesting observation is that the influence of information quality on PU and PEOU is insignificant ($p > .05$) for male users. However, the effect is significant for female healthcare workers. As expected, professional boundary awareness significantly influences the notion of PU and PEOU for both male and female healthcare workers. Another notable finding is that the influence of privacy threat also significantly differs among male and female healthcare professionals. For female healthcare professionals, privacy threat significantly influences PU and PEOU ($p < .05$). However, the effect is insignificant for their male counterparts in both cases.

5.3 Theoretical Implications

This research questions the conventional acumen that behavioural intention to use social media is directly linked with some standard conventional antecedents. To address this contention, this study developed and tested a research framework by integrating barrier-related factors as a novel predictor affecting usage of social media by medical professionals. Factors such as professional boundary, perceived trust, privacy threat, facilitating conditions, and self-efficacy are creating cynicism in the minds of medical professionals and causing slow rates of social media usage in Australia's healthcare system. This is likely to be one of the few quantitative research studies on healthcare social media that takes into account the perceptions of Australian health professionals on social media for communicating on medical issues. The construct measurement scales derived from existing literature are deemed reliable given the solid composite reliabilities of the constructs. It confirms these instruments can be safely applied in future research within the social media healthcare domain.

The current state of research regarding the adoption of social media in healthcare seems to lack insights from the perspectives of potential users, their perceptions, and behaviours (Smailhodzic et al., 2016). Therefore, the primary contribution of this study is to establish the significance of a number of external variables in an extended TAM-based approach, one that explains the barrier-related factors affecting social media usage in healthcare. In this context the validated research framework can serve to evaluate the barriers of social media adoption.

Generalisation of PU and PEOU in the healthcare domain is a complex issue, considering the dynamic nature of social media that makes it difficult to generalise. However, this research has uncovered the impact of barrier-related factors on health professionals' behavioural intention to use social media. Although generalisation is limited to the study participants, this research has, at least, structurally modelled the impacts of the possible barriers. It has taken into account the complexities associated with the moderating variables affecting health professionals' perception and use of social media in Australia. Consequently, this research advances the previous research on the topic and contributes to this rapidly evolving field of study. To sum up, the novelty of this research enterprise lies in modelling several untested factors impacting on the usage of social media in healthcare in an Australian setting.

5.4 Practical Implications

The findings of this study can be considered timely given the current context of the COVID-19 pandemic and how it is greatly affecting people's health or their perceptions of how it could do so. Medical professionals in Australia and beyond are faced with new challenges in providing effective services to clients in a more efficient way by utilising various online platforms. More specifically, the findings of this research have become more critical as the coronavirus has triggered a widespread online search for information, but has resulted instead in the rapid dissemination of misinformation, lies, unverified assumptions, etc. The impact of health misinformation can be devastating as the public often rely on such information while making important health decisions (Cuan-Baltazar, Muñoz-Perez, Robledo-Vega, Pérez-Zepeda, & Soto-Vega, 2020). Consequently, the role of health professionals has become even more critical, as healthcare workers can play a significant role in curbing the spread of misinformation that is so prevalent on social media sites. By understanding the health professionals' attitude towards social media usage, government agencies can formulate appropriate policies and strategies to involve health professionals in the quest to stop the spread of misinformation. For example, health authorities around the world can engage

medical professionals to promote required actions relating to hygiene and social distancing, clarify misconceptions and disseminate correct and reliable health information based on sound scientific principles using social media.

The study findings may provide an opportunity for healthcare providers and policy-makers to understand users' perceptions of the potential challenges of using social media. The barriers noted in this research call for a clear social media usage policy, specifically one where health professionals are armed with a guideline to maximise the potential benefits of social media usage and overcome problems. Also, the findings point to the need to educate, inform, and engage healthcare professionals and patients in reaping the benefits of using social media more effectively to achieve the above-stated ends (Keir, Bamat, Patel, Elkhateeb, & Roland, 2019). The growing importance of social media in the current pandemic afflicting the world is evident, especially given that healthcare professionals and their clients can in many cases no longer meet in person.

Furthermore, it is worth mentioning here that the introduction of social media in healthcare is resulting in organisational changes. Healthcare organisations can draw on the best practices around the world and work on the design and implementation of social media platforms and generate high levels of business for their services. Finally, since the challenges posed by the pandemic are putting pressure on healthcare services to introduce innovative devices able to handle the diverse needs of patients, organisations need to respond in a timely way.

6. Limitations and future research

Although the findings of this study point toward a sound understanding of the factors affecting the intention to use social media by healthcare professionals, several limitations need to be appreciated. First, this research did not seek to investigate the antecedents of the barriers of social media usage from the perspective of any specific group of health professionals. Instead, it investigates the barrier-related factors from a holistic perspective which may limit the findings' generalisability. According to their profiles the health professionals comprised general practitioners (GPs), medical specialists, physiotherapists, surgeons, and pharmacists. Future research should investigate the perspective of a specific group of healthcare professionals which may strengthen the applicability of the proposed theoretical framework that seeks to explain their social media adoption behaviours.

Second, the model variables explain 54% of behavioural intention by health professionals to use social media. Thus, a considerable percentage of the variables remain unexplained, warranting the need for further research to explain user beliefs and attitude toward use. Examples of these factors include social influence (Venkatesh, 2003), perceived cost (Gupta, Joshi, & Agarwal, 2012) and perceived risk (Kamal, Shafiq, & Kakria, 2020). Third, the moderating effects of other variables such as clinical experience and location (urban vs rural) may be a subject for further analysis. Fourth, the issue of generalisability is a widely revealed limitation in the majority of research on technology acceptance. This study has been conducted in Australia and the findings may not be applicable to other contexts or countries. For example, the Australian and US healthcare systems are vastly different with varied models of care and practice (Blendon et al., 2002). The United States healthcare system is a highly privatised and profit-oriented one, characterised by efficient service delivery and high-quality resources - depending on the client's ability to pay for them - and low or non-existent government subsidies. Conversely, in Australia public healthcare is freely accessible to all citizens and

permanent residents (O'Brien, 2017). The apparent differences between these two healthcare systems are also characterised by more frequent professional use of social media by US healthcare workers compared to their Australian counterparts (McGowan et al., 2012; Usher, 2012). Therefore, caution should be exercised when applying the findings of this research to other contexts. More robust studies including a cross-country comparison would enhance generalisation of the findings. Finally, this study will benefit from a mixed method approach because both presence of qualitative and quantitative data may complement each other in this type of research and provide better generalisability.

References

- Abdullah, F., Ward, R., & Ahmed, E. (2016). Investigating the influence of the most commonly used external variables of TAM on students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolios. *Computers in Human Behavior*, 63, 75-90. doi: <https://doi.org/10.1016/j.chb.2016.05.014>.
- Abedin, B., Abedin, B., Khoei, T. T., & Ghapanchi, A. R. (2013). A review of critical factors for communicating with customers on social networking sites. *The International Technology Management Review*, 3(4), 208-218. doi: <https://dx.doi.org/10.2991/itmr.2013.3.4.1>
- Abedin, B., Erfani, S., & Blount, Y. (2017). Social media adoption framework for aged care service providers in Australia. In 2017 International Conference on Research and Innovation in Information Systems (ICRIIS) (pp. 1-6). IEEE. doi: <https://doi.org/10.1109/ICRIIS.2017.8002485>
- Adhikari, K., & Panda, R. K. (2018). Users' information privacy concerns and privacy protection behaviors in social networks. *Journal of Global Marketing*, 31(2), 96-110. doi: <https://doi.org/10.1080/08911762.2017.1412552>
- Adzharuddin, N. A., & Ramly, N. M. (2015). Nourishing healthcare information over Facebook. *Procedia-Social and Behavioral Sciences*, 172, 383-389. doi: <https://doi.org/10.1016/j.sbspro.2015.01.384>
- Al-Ammary, J. H., Al-Sherooqi, A. K., & Al-Sherooqi, H. K. (2014). The acceptance of social networking as a learning tools at University of Bahrain. *International Journal of Information Education Technology*, 4(2), 208-214.
- Al-Muhtadi, J., Shahzad, B., Saleem, K., Jameel, W., & Orgun, M. (2019). Cybersecurity and privacy issues for socially integrated mobile healthcare applications operating in a multi-cloud environment. *Health Informatics Journal*, 25(2), 315-329. doi: <https://doi.org/10.1177/1460458217706184>
- Al-Mushasha, N. F. A. (2013, May). Determinants of e-learning acceptance in higher education environment based on extended technology acceptance model. In 2013 Fourth International Conference on e-Learning" Best Practices in Management, Design and Development of e-Courses: Standards of Excellence and Creativity" (pp. 261-266). IEEE. doi: 10.1109/ECONF.2013.50
- Al-Qirim, N. (2007). Championing telemedicine adoption and utilization in healthcare organizations in New Zealand. *International Journal of Medical Informatics*, 76(1), 42-54. doi: <https://doi.org/10.1016/j.ijmedinf.2006.02.001>

- Ali-Hassan, H., Nevo, D., & Wade, M. (2015). Linking dimensions of social media use to job performance: The role of social capital. *The Journal of Strategic Information Systems*, 24(2), 65-89. doi: <https://doi.org/10.1016/j.jsis.2015.03.001>
- Alwan, K., Ayele, T. A., & Tilahun, B. (2015). Knowledge and utilization of computers among health professionals in a developing country: a cross-sectional study. *JMIR Human Factors*, 2(1), e4. doi:10.2196/humanfactors.4184
- Antheunis, M. L., Tates, K., & Nieboer, T. E. (2013). Patients' and health professionals' use of social media in health care: motives, barriers and expectations. *Patient Education and Counseling*, 92(3), 426-431. doi: <https://doi.org/10.1016/j.pec.2013.06.020>
- Archambault, P. M., Bilodeau, A., Gagnon, M.-P., Aubin, K., Lavoie, A., Lapointe, J., . . . Légaré, F. (2012). Health care professionals' beliefs about using wiki-based reminders to promote best practices in trauma care. *Journal of Medical Internet Research*, 14(2). doi:10.2196/jmir.1983
- Awad, N. F., & Krishnan, M. S. (2006). The personalization privacy paradox: an empirical evaluation of information transparency and the willingness to be profiled online for personalization. *MIS Quarterly*, 30, 13-28. doi: <https://doi.org/10.2307/25148715>.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. doi: <https://doi.org/10.1037/0033-295X.84.2.191>
- Bansal, G., & Gefen, D. (2010). The impact of personal dispositions on information sensitivity, privacy concern and trust in disclosing health information online. *Decision Support Systems*, 49(2), 138-150. doi: <https://doi.org/10.1016/j.dss.2010.01.010>
- Barnes, S. S., Kaul, V., & Kudchadkar, S. R. (2019). Social media engagement and the critical care medicine community. *Journal of Intensive Care Medicine*, 34(3), 175-182. doi: <https://doi.org/10.1177/0885066618769599>
- Bhattacharjee, A., & Hikmet, N. (2007). Physicians' resistance toward healthcare information technology: a theoretical model and empirical test. *European Journal of Information Systems*, 16(6), 725-737. doi: <https://doi.org/10.1057/palgrave.ejis.3000717>
- Blendon, R. J., Schoen, C., DesRoches, C. M., Osborn, R., Scoles, K. L., & Zapert, K. (2002). Inequities in health care: a five-country survey. *Health Affairs*, 21(3), 182-191. doi: <https://doi.org/10.1377/hlthaff.21.3.182>
- Brandyberry, A. A., Li, X., & Lin, L. (2010, August). Determinants of Perceived Usefulness and Perceived Ease of Use in Individual Adoption of Social Network Sites. In *AMCIS* (p. 544). URL: <https://aisel.aisnet.org/amcis2010/544/>
- Braun, M. T. (2013). Obstacles to social networking website use among older adults. *Computers in Human Behavior*, 29(3), 673-680. doi: <https://doi.org/10.1016/j.chb.2012.12.004>
- Buettner, R. (2015, January). Analyzing the problem of employee internal social network site avoidance: Are users resistant due to their privacy concerns?. In *2015 48th Hawaii International Conference on System Sciences* (pp. 1819-1828). IEEE. doi: 10.1109/HICSS.2015.220

- Burton-Jones, A., & Straub Jr, D. W. (2006). Reconceptualizing system usage: An approach and empirical test. *Information Systems Research*, 17(3), 228-246. doi: <https://doi.org/10.1287/isre.1060.0096>
- Cain, J. (2011). Social media in health care: the case for organizational policy and employee education. *American Journal of Health-System Pharmacy*, 68(11), 1036-1040. doi: <https://doi.org/10.2146/ajhp100589>
- Chang, I.-C., Hwang, H.-G., Hung, W.-F., & Li, Y.-C. (2007). Physicians' acceptance of pharmacokinetics-based clinical decision support systems. *Expert Systems with Applications*, 33(2), 296-303. doi: <https://doi.org/10.1016/j.eswa.2006.05.001>
- Chau, M., & Xu, J. (2012). Business intelligence in blogs: Understanding consumer interactions and communities. *MIS Quarterly*, 36(4), 1189-1216. doi: <https://doi.org/10.2307/41703504>
- Chau, P. Y., & Hu, P. J.-H. (2002). Investigating healthcare professionals' decisions to accept telemedicine technology: an empirical test of competing theories. *Information & Management*, 39(4), 297-311. doi: [https://doi.org/10.1016/S0378-7206\(01\)00098-2](https://doi.org/10.1016/S0378-7206(01)00098-2)
- Cheng, T. E., Lam, D. Y., & Yeung, A. C. (2006). Adoption of internet banking: an empirical study in Hong Kong. *Decision Support Systems*, 42(3), 1558-1572. doi: <https://doi.org/10.1016/j.dss.2006.01.002>
- Chou, W.-Y. S., Hunt, Y. M., Beckjord, E. B., Moser, R. P., & Hesse, B. W. (2009). Social media use in the United States: implications for health communication. *Journal of Medical Internet Research*, 11(4). doi:10.2196/jmir.1249
- Chretien, K. C., & Kind, T. (2013). Social media and clinical care: ethical, professional, and social implications. *Circulation*, 127(13), 1413-1421. doi: <https://doi.org/10.1161/CIRCULATIONAHA.112.128017>
- CivicWebMedia. (2021, 18/01/2021). Australia's most popular social media sites 2021. Retrieved from <https://www.civicwebmedia.com.au/australias-most-popular-social-media-sites/>
- Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, 19(2), 189-211. doi: <https://doi.org/10.2307/249688>
- Conway, M., Cao, Y., & Hong, P. (2011). Antecedents and consequences of social media utilization in college teaching: a proposed model with mixed-methods investigation. *On the Horizon*, 19(4), 297-306. doi: <https://doi.org/10.1108/10748121111179420>
- Cuan-Baltazar, J. Y., Muñoz-Perez, M. J., Robledo-Vega, C., Pérez-Zepeda, M. F., & Soto-Vega, E. (2020). Misinformation of COVID-19 on the internet: infodemiology study. *JMIR Public Health Surveillance*, 6(2), e18444. doi: <https://doi.org/10.2196/18444>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340. doi: <https://doi.org/10.2307/249008>
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8), 982-1003. doi: <https://doi.org/10.1287/mnsc.35.8.982>

- DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60-95. doi: <https://doi.org/10.1287/isre.3.1.60>
- Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems*, 19(4), 9-30. doi: <https://doi.org/10.1080/07421222.2003.11045748>
- Denecke, K., Bamidis, P., Bond, C., Gabarron, E., Househ, M., Lau, A., . . . Hansen, M. (2015). Ethical issues of social media usage in healthcare. *Yearbook of Medical Informatics*, 10(1), 137. doi: 10.15265/IY-2015-001
- Devine, P. J. (2017). *Social Media and Health Care. Using Social Media to Build Library Communities: A LITA Guide*, 65.
- Duyck, P., Pynoo, B., Devolder, P., Voet, T., Adang, L., & Vercruyse, J. (2008). User acceptance of a picture archiving and communication system. *Methods of Information in Medicine*, 47(02), 149-156. doi: 10.3414/ME0477
- Erfani, S. S., Abedin, B., & Blount, Y. (2017). The effect of social network site use on the psychological well-being of cancer patients. *Journal of the Association for Information Science*, 68(5), 1308-1322. doi: <https://doi.org/10.1002/asi.23702>
- Farnan, J. M., Paro, J. A., Higa, J. T., Reddy, S. T., Humphrey, H. J., & Arora, V. M. (2009). Commentary: the relationship status of digital media and professionalism: it's complicated. *Academic Medicine*, 84(11), 1479-1481. doi: 10.1097/ACM.0b013e3181bb17af
- Farnan, J. M., Sulmasy, L. S., Worster, B. K., Chaudhry, H. J., Rhyne, J. A., & Arora, V. M. (2013). Online medical professionalism: patient and public relationships: policy statement from the American College of Physicians and the Federation of State Medical Boards. *Annals of Internal Medicine*, 158(8), 620-627. doi: <https://doi.org/10.7326/0003-4819-158-8-201304160-00100>
- Featherman, M. S., Miyazaki, A. D., & Sprott, D. E. (2010). Reducing online privacy risk to facilitate e-service adoption: the influence of perceived ease of use and corporate credibility. *Journal of Services Marketing*, 24(3), 219-229. doi: <https://doi.org/10.1108/08876041011040622>
- Fernández-Luque, L., & Bau, T. (2015). Health and social media: perfect storm of information. *Healthcare Informatics Research*, 21(2), 67-73. doi: 10.4258/hir.2015.21.2.67
- Fisher, J., & Clayton, M. (2012). Who gives a tweet: assessing patients' interest in the use of social media for health care? *Worldviews on Evidence-Based Nursing*, 9(2), 100-108. doi: <https://doi.org/10.1111/j.1741-6787.2012.00243.x>
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18(3), 382-388. doi: 10.1177/002224378101800313
- Franco, O. I., & Tirrell, T. F. (2012). Smartphone app use among medical providers in ACGME training programs. *Journal of Medical Systems*, 36(5), 3135-3139. doi: <https://doi.org/10.1007/s10916-011-9798-7>

- Gagnon, K., & Sabus, C. (2015). Professionalism in a digital age: opportunities and considerations for using social media in health care. *Physical Therapy*, 95(3), 406-414. doi: <https://doi.org/10.2522/ptj.20130227>
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27(1), 51-90. doi: <https://doi.org/10.2307/30036519>
- Gholami-Kordkheili, F., Wild, V., & Strech, D. (2013). The impact of social media on medical professionalism: a systematic qualitative review of challenges and opportunities. *Journal of Medical Internet Research*, 15(8), e184. doi:10.2196/jmir.2708
- Grajales III, F. J., Sheps, S., Ho, K., Novak-Lauscher, H., & Eysenbach, G. (2014). Social media: a review and tutorial of applications in medicine and health care. *Journal of Medical Internet Research*, 16(2). doi:10.2196/jmir.2912
- Gupta, B., Joshi, S., & Agarwal, M. (2012). The effect of expected benefit and perceived cost on employees' knowledge sharing behavior: A study of IT employees in India. *Organizations Markets in Emerging Economies*, 3(1), 8-19. doi:10.15388/omee.2012.3.1.14272.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis*, 6th ed. Uppersaddle River: Pearson Prentice Hall.
- Hansen, J. M., Saridakis, G., & Benson, V. (2018). Risk, trust, and the interaction of perceived ease of use and behavioral control in predicting consumers' use of social media for transactions. *Computers in Human Behavior*, 80, 197-206. doi: <https://doi.org/10.1016/j.chb.2017.11.010>
- Hanson, C. L., West, J., Thackeray, R., Barnes, M. D., & Downey, J. (2014). Understanding and predicting social media use among community health center patients: a cross-sectional survey. *Journal of Medical Internet Research*, 16(11), e270. doi:10.2196/jmir.3373
- Hocevar, K. P., Flanagin, A. J., & Metzger, M. J. (2014). Social media self-efficacy and information evaluation online. *Computers in Human Behavior*, 39, 254-262. <https://doi.org/10.1016/j.chb.2014.07.020>
- Holden, R. J., & Karsh, B.-T. (2010). The technology acceptance model: its past and its future in health care. *Journal of Biomedical Informatics*, 43(1), 159-172. doi: <https://doi.org/10.1016/j.jbi.2009.07.002>
- Hoque, M. R., Bao, Y., & Sorwar, G. (2017). Investigating factors influencing the adoption of e-Health in developing countries: A patient's perspective. *Informatics for Health Social Care*, 42(1), 1-17. <https://doi.org/10.3109/17538157.2015.1075541>
- Househ, M., Borycki, E., & Kushniruk, A. (2014). Empowering patients through social media: the benefits and challenges. *Health Informatics Journal*, 20(1), 50-58. doi: <https://doi.org/10.1177/1460458213476969>
- Hsu, M.-H., & Chiu, C.-M. (2004). Internet self-efficacy and electronic service acceptance. *Decision Support Systems*, 38(3), 369-381. doi: <https://doi.org/10.1016/j.dss.2003.08.001>
- Jo, H. S., Song, T.-M., & Kim, B. G. (2017). Analysis of the Factors Affecting Consumer Acceptance of Accredited Online Health Information. *Journal of Korean Medical Science*, 32(11), 1757-1763. doi: <https://doi.org/10.3346/jkms.2017.32.11.1757>

- Kamal, S. A., Shafiq, M., & Kakria, P. (2020). Investigating acceptance of telemedicine services through an extended technology acceptance model (TAM). *Technology in Society*, 60, 101212. doi: <https://doi.org/10.1016/j.techsoc.2019.101212>
- Kamboj, S., & Rahman, Z. (2016). The influence of user participation in social media-based brand communities on brand loyalty: age and gender as moderators. *Journal of Brand Management*, 23(6), 679-700. doi: <https://doi.org/10.1057/s41262-016-0002-8>
- Kapoor, K. K., Tamilmani, K., Rana, N. P., Patil, P., Dwivedi, Y. K., & Nerur, S. (2018). Advances in social media research: Past, present and future. *Information Systems Frontiers*, 20(3), 531-558. doi: <https://doi.org/10.1007/s10796017-9810-y>
- Keir, A., Bamat, N., Patel, R. M., Elkhateeb, O., & Roland, D. (2019). Utilising social media to educate and inform healthcare professionals, policy-makers and the broader community in evidence-based healthcare. *BMJ Evidence-Based Medicine*, 24(3), 87-89. doi: <http://dx.doi.org/10.1136/bmjebm-2018-111016>
- Kline, S., Dyer-Witheford, N., & De Peuter, G. (2003). *Digital play: The interaction of technology, culture, and marketing*. McGill-Queen's University Press.
- Kotsenas, A. L., Arce, M., Aase, L., Timimi, F. K., Young, C., & Wald, J. T. (2018). The strategic imperative for the use of social media in health care. *Journal of the American College of Radiology*, 15(1), 155-161. doi: <https://doi.org/10.1016/j.jacr.2017.09.027>
- Kouzy, R., Abi Jaoude, J., Kraitem, A., El Alam, M. B., Karam, B., Adib, E., Baddour, K. (2020). Coronavirus goes viral: quantifying the COVID-19 misinformation epidemic on Twitter. *Cureus*, 12(3). doi: <https://dx.doi.org/10.7759%2Fcureus.7255>
- Kucukusta, D., Law, R., Besbes, A., & Legohérel, P. (2015). Re-examining perceived usefulness and ease of use in online booking. *International Journal of Contemporary Hospitality Management*, 27(2), 185-198. doi: <https://doi.org/10.1108/IJCHM-09-2013-0413>
- Kuek, A., & Hakkennes, S. (2020). Healthcare staff digital literacy levels and their attitudes towards information systems. *Health Informatics Journal*, 26(1), 592-612. doi: <https://doi.org/10.1177/1460458219839613>
- Kunst, H., Groot, D., Latthe, P. M., Latthe, M., & Khan, K. S. (2002). Accuracy of information on apparently credible websites: survey of five common health topics. *British Medical Journal*, 324(7337), 581-582. doi: <https://doi.org/10.1136/bmj.324.7337.581>
- Kwon, J. H., Kye, S.-Y., Park, E. Y., Oh, K. H., & Park, K. (2015). What predicts the trust of online health information? *Epidemiology Health Communication*, 37(e2015030). doi: 10.4178/epih/e2015030
- Lanier Jr, C. D., & Saini, A. (2008). Understanding consumer privacy: A review and future directions. *Academy of Marketing Science Review*, 2008, 12(2).
- Lau, A. S. (2011). Hospital-based nurses' perceptions of the adoption of Web 2.0 tools for knowledge sharing, learning, social interaction and the production of collective intelligence. *Journal of Medical Internet Research*, 13(4), e92. doi:10.2196/jmir.1398
- Lee, Y.-H., Hsieh, Y.-C., & Chen, Y.-H. (2013). An investigation of employees' use of e-learning systems: applying the technology acceptance model. *Behaviour Information Technology*, 32(2), 173-189. <https://doi.org/10.1080/0144929X.2011.577190>

- Liaw, S.-S., & Huang, H.-M. (2013). Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers Education*, 60(1), 14-24. doi: <https://doi.org/10.1016/j.compedu.2012.07.015>
- Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014). Antecedents of the adoption of the new mobile payment systems: The moderating effect of age. *Computers in Human Behavior*, 35, 464-478. doi: <https://doi.org/10.1016/j.chb.2014.03.022>
- Lin, W.-Y., Zhang, X., Song, H., & Omori, K. (2016). Health information seeking in the Web 2.0 age: Trust in social media, uncertainty reduction, and self-disclosure. *Computers in Human Behavior*, 56, 289-294. doi: <https://doi.org/10.1016/j.chb.2015.11.055>
- Lober, W. B., & Flowers, J. L. (2011). Consumer empowerment in health care amid the internet and social media. *Seminars in Oncology Nursing*, 27(3), 169-182. doi: <https://doi.org/10.1016/j.soncn.2011.04.002>
- Machdar, N. M. (2019). The effect of information quality on Percieved usefulness and ease of ose *Business Entrepreneurial Review*, 15(2), 131-146. doi: <http://dx.doi.org/10.25105/ber.v15i2.4630>
- MacLure, K., & Stewart, D. (2016). Digital literacy knowledge and needs of pharmacy staff: a systematic review. *Journal of Innovation in Health Informatics*, 23(3). doi: <https://doi.org/10.14236/jhi.v23i3.840>
- Madnick, S. E., Wang, R. Y., Lee, Y. W., & Zhu, H. (2009). Overview and framework for data and information quality research. *Journal of Data Information Quality*, 1(1), 1-22. doi: <https://doi.org/10.1145/1515693.1516680>
- Malik, S., & Coulson, N. S. (2010). 'They all supported me but I felt like I suddenly didn't belong anymore': an exploration of perceived disadvantages to online support seeking. *Journal of Psychosomatic Obstetrics & Gynecology*, 31(3), 140-149. <https://doi.org/10.3109/0167482X.2010.504870>
- Martinasek, M. P., Panzera, A. D., Schneider, T., Lindenberger, J. H., Bryant, C. A., McDermott, R. J., & Couluris, M. (2011). Benefits and barriers of pediatric healthcare providers toward using social media in asthma care. *American Journal of Health Education*, 42(4), 213-221. doi: <https://doi.org/10.1080/19325037.2011.10599190>
- McGowan, B. S., Wasko, M., Vartabedian, B. S., Miller, R. S., Freiherr, D. D., & Abdolrasulnia, M. (2012). Understanding the factors that influence the adoption and meaningful use of social media by physicians to share medical information. *Journal of Medical Internet Research*, 14(5), e117. doi:10.2196/jmir.2138
- Moick, M., & Terlutter, R. (2012). Physicians' motives for professional internet use and differences in attitudes toward the internet-informed patient, physician-patient communication, and prescribing behavior. *Medicine 2.0*, 1(2), e2. doi: [10.2196/med20.1996](https://doi.org/10.2196/med20.1996)
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222. doi: <https://doi.org/10.1287/isre.2.3.192>

- Moorhead, S. A., Hazlett, D. E., Harrison, L., Carroll, J. K., Irwin, A., & Hoving, C. (2013). A new dimension of health care: systematic review of the uses, benefits, and limitations of social media for health communication. *Journal of Medical Internet Research*, 15(4), e85. doi:10.2196/jmir.1933
- Morosan, C. (2012). Theoretical and empirical considerations of guests' perceptions of biometric systems in hotels: Extending the technology acceptance model. *Journal of Hospitality Tourism Research*, 36(1), 52-84. <https://doi.org/10.1177/1096348010380601>
- Mou, J., Shin, D.-H., & Cohen, J. (2017). Understanding trust and perceived usefulness in the consumer acceptance of an e-service: a longitudinal investigation. *Behaviour Information Technology*, 36(2), 125-139. doi: <https://doi.org/10.1080/0144929X.2016.1203024>
- Nikou, S., Agahari, W., Keijzer-Broers, W., & de Reuver, M. (2019). Digital healthcare technology adoption by elderly people: A capability approach model. *Journal of Telematics Informatics*, 53, 101315. <https://doi.org/10.1016/j.tele.2019.101315>
- O'Brien, L. (2017, September 23, 2017). The Inside Scoop Part 1: A comparison of the U.S. and Australian healthcare systems. *onthewards*.
- Panahi, S., Watson, J., & Partridge, H. (2016). Social media and physicians: exploring the benefits and challenges. *Health Informatics Journal*, 22(2), 99-112. doi: <https://doi.org/10.1177/1460458214540907>
- Park, A., Bowling, J., Shaw, G., Li, C., & Chen, S. (2019). Adopting Social Media for Improving Health Opportunities and Challenges. *North Carolina Medical Journal*, 80(4), 240-243. doi: <https://doi.org/10.18043/ncm.80.4.240>
- Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce*, 7(3), 101-134. doi: <https://doi.org/10.1080/10864415.2003.11044275>
- Pavlou, P. A., & Gefen, D. (2004). Building effective online marketplaces with institution-based trust. *Information Systems Research*, 15(1), 37-59. doi: <https://doi.org/10.1287/isre.1040.0015>
- Pavlou, P. A., Liang, H., & Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective. *MIS Quarterly*, 31(1), 105-136. doi: <https://doi.org/10.2307/25148783>
- Peñarroja, V., Sánchez, J., Gamero, N., Orengo, V., & Zornoza, A. M. (2019). The influence of organisational facilitating conditions and technology acceptance factors on the effectiveness of virtual communities of practice. *Behaviour Information Technology*, 38(8), 845-857. <https://doi.org/10.1080/0144929X.2018.1564070>
- Robeyns, I. (2005). The capability approach: a theoretical survey. *Journal of Human Development*, 6(1), 93-117. <https://doi.org/10.1080/146498805200034266>
- Rogers, E. M. (2003). Elements of diffusion. *Diffusion of Innovations*, 5(1.38).
- Rolls, K., Hansen, M., Jackson, D., & Elliott, D. (2016). How health care professionals use social media to create virtual communities: an integrative review. *Journal of Medical Internet Research*, 18(6), e166. doi: <https://doi.org/10.2196/jmir.5312>

- Saeed, K. A., & Abdinnour-Helm, S. (2008). Examining the effects of information system characteristics and perceived usefulness on post adoption usage of information systems. *Information Management Decision*, 45(6), 376-386. doi: <https://doi.org/10.1016/j.im.2008.06.002>
- Salim, B. (2012). An application of UTAUT model for acceptance of social media in Egypt: A statistical study. *International Journal of Information Science*, 2(6), 92-105. doi: [10.5923/j.ijis.20120206.05](https://doi.org/10.5923/j.ijis.20120206.05)
- Smailhodzic, E., Hooijsma, W., Boonstra, A., & Langley, D. J. (2016). Social media use in healthcare: A systematic review of effects on patients and on their relationship with healthcare professionals. *BMC Health Services Research*, 16(1), 442. doi: [10.1186/s12913-016-1691-0](https://doi.org/10.1186/s12913-016-1691-0)
- Steenkamp, J.-B. E., & Baumgartner, H. (2000). On the use of structural equation models for marketing modeling. *International Journal of Research in Marketing*, 17(2-3), 195-202. doi: [https://doi.org/10.1016/S0167-8116\(00\)00016-1](https://doi.org/10.1016/S0167-8116(00)00016-1)
- Talaei-Khoei, A., Lewis, L., Khoei, T., Ghapanchi, A., & Vichitvanichphong, S. (2015). Seniors' perspective on perceived transfer effects of assistive robots in elderly care: Capability approach analysis. In: 36th International Conference on Information Systems (ICIS 2015) - Exploring the Information Frontier, 13-15 December 2015, Fort Worth, Texas.
- Teigland, R., & Wasko, M. M. (2003). Integrating knowledge through information trading: Examining the relationship between boundary spanning communication and individual performance. *Decision Sciences*, 34(2), 261-286. doi: <https://doi.org/10.1111/1540-5915.02341>
- Teo, T. (2011). Modeling the determinants of pre-service teachers' perceived usefulness of e-learning. *Campus-Wide Information Systems*, 28(2), 124-140. doi: <https://doi.org/10.1108/10650741111117824>
- Thompson, R. L., Higgins, C. A., & Howell, J. M. (1991). Personal computing: toward a conceptual model of utilization. *MIS Quarterly*, 15(1), 125-143. doi: <https://doi.org/10.2307/249443>
- Triandis, H. C. (1979). Values, attitudes, and interpersonal behavior. Paper presented at the Nebraska symposium on motivation, 27, 195-259.
- Usher, K., Woods, C., Casella, E., Glass, N., Wilson, R., Mayner, L., Mather, C. (2014). Australian health professions student use of social media. *Collegian*, 21(2), 95-101. doi: <https://doi.org/10.1016/j.colegn.2014.02.004>
- Usher, W. (2011). Types of social media (Web 2.0) used by Australian allied health professionals to deliver early twenty-first-century practice promotion and health care. *Social Work in Health Care*, 50(4), 305-329. doi: [10.1080/00981389.2010.534317](https://doi.org/10.1080/00981389.2010.534317)
- Usher, W. T. (2012). Australian health professionals' social media (Web 2.0) adoption trends: early 21st century health care delivery and practice promotion. *Australian Journal of Primary Health*, 18(1), 31-41. doi: <https://doi.org/10.1071/PY10084>
- Van Der Velden, M., & El Emam, K. (2013). "Not all my friends need to know": a qualitative study of teenage patients, privacy, and social media. *Journal of the American Medical Informatics Association*, 20(1), 16-24. doi: <https://doi.org/10.1136/amiajnl-2012-000949>

- van Uden-Kraan, C. F., Drossaert, C. H., Taal, E., Smit, W. M., Seydel, E. R., & van de Laar, M. A. (2010). Experiences and attitudes of Dutch rheumatologists and oncologists with regard to their patients' health-related Internet use. *Clinical Rheumatology*, 29(11), 1229-1236. doi: <https://doi.org/10.1007/s10067-010-1435-1>
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11(4), 342-365. doi: <https://doi.org/10.1287/isre.11.4.342.11872>
- Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186-204. doi:10.1287/mnsc.46.2.186.11926
- Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences*, 27(3), 451-481. doi: <https://doi.org/10.1111/j.1540-5915.1996.tb00860.x>
- Venkatesh, V., Sykes, T. A., & Zhang, X. (2011). 'Just what the doctor ordered': a revised UTAUT for EMR system adoption and use by doctors. Paper presented at the 2011 44th Hawaii International Conference on System Sciences.
- Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178. doi: <https://doi.org/10.2307/41410412>
- Westin, A. F. J. W., & Review, L. L. (1968). Privacy and freedom. *Washington and Lee Law Review*, 25(1), 166-170.
- Yarbrough, A. K., & Smith, T. B. (2007). Technology acceptance among physicians: a new take on TAM. *Medical Care Research and Review*, 64(6), 650-672. <https://doi.org/10.1177/1077558707305942>
- Zhang, X., Guo, X., Lai, K.-h., Guo, F., & Li, C. (2014). Understanding gender differences in m-health adoption: a modified theory of reasoned action model. *Telemedicine e-Health*, 20(1), 39-46. <https://doi.org/10.1089/tmj.2013.0092>
- Zhao, Y., Ni, Q., & Zhou, R. (2018). What factors influence the mobile health service adoption? A meta-analysis and the moderating role of age. *International Journal of Information Management*, 43, 342-350. doi: <https://doi.org/10.1016/j.ijinfomgt.2017.08.006>
- Zhou, Z., Jin, X.-L., & Fang, Y. (2014). Moderating role of gender in the relationships between perceived benefits and satisfaction in social virtual world continuance. *Decision Support Systems*, 65, 69-79. doi: <https://doi.org/10.1016/j.dss.2014.05.004>

Copyright: © 2021 authors. This is an open-access article distributed under the terms of the [Creative Commons Attribution-NonCommercial 3.0 Australia License](https://creativecommons.org/licenses/by-nc/3.0/australia/), which permits non-commercial use, distribution, and reproduction in any medium, provided the original author and AJIS are credited.

doi: <https://doi.org/10.3127/ajis.v25i0.2625>

