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Abstract

Purpose – Although the health information seeking behavior of consumers through the internet has received great attention, limited attempt has been made to integrate both the health information seeking behavior and the usage behavior in a mobile online context. The purpose of this paper is to explore the factors that influence consumer mobile health information seeking (MHIS) and usage behavior based on information quality, perceived value, personal health value, and trust.

Design/methodology/approach – A survey was conducted to collect data. A two-step approach of structure equation modeling based was used to test the measurement model and hypothesis model.

Findings – Information quality, perceived value, and trust were found to have positive effects on both the intention to seek and to use health information, and that the intention to seek affects the intention to use. Among the three components of perceived value, the utilitarian and epistemic values were found to have significant effects on intention to seek. In addition, the current health status of health consumers moderates the relationships between MHIS and usage intention and their determinants.

Originality/value – Studies have primarily focussed on online health information seeking behavior, whereas a few of these studies have examined the seeking behavior intention and the usage behavior intention in a general model. The results indicate that health information usage behavior intention is closely related to the seeking behavior intention in the mobile context, which enriches the research on the relationship between information seeking and its outcomes. Furthermore, this study highlights the impact of information quality, perceived value, and trust on the intention to seek, and the impacts of information quality and trust on the intention to use, which have been overlooked in previous studies on MHIS.

Keywords Information seeking behaviour, Trust, Behaviour intention, Hypothesis testing, Mobile phones, Health status

Paper type Research paper

1. Introduction

According to the statistics released by the China National Committee on Aging (CNCA), people older than 60 constitute 14.8 percent of the Chinese population (CNCA, 2013). Having the largest aging population in the world, China now faces the issue of

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population aging. Moreover, as society develops, the older population suffers from increasing psychological pressure, and health problems become more serious. Mental disease, obesity, chronic diseases have become more prevalent in China. This older and sub-healthy population will undoubtedly experience grave economic and social challenges in the future. In addition, as a developing country, China faces severe medical problems. Proper healthcare is expensive and difficult to obtain for most people. Nonetheless, the rapid development of information and communications technology can provide better solutions to overcome these problems (García-Sánchez *et al.*, 2012). A report by the Ministry of Industry and Information Technology of the People's Republic of China shows that the number of Chinese mobile phone users has reached 1.15 billion, 96.4 percent of which accounts for mobile internet users (MIIT, 2013). Mobile phones have become a necessary part of daily life for a great number of people in China. Internet applications used on computer terminals have spread in mobile phones as well. Particular groups of people, particularly the youth, prefer surfing the internet through handheld devices such as mobile phones or tablets, which they can use anytime and anywhere (e.g. while waiting in line or while riding the bus). Moreover, given the personal nature of ownership, a mobile phone can provide a confidential and safe means of obtaining solutions for gynecological, psychological, cosmetic surgery, and other highly private health problems.

Studies have shown that people's active attitudes and their personal involvement to healthcare, such as the self-management and self-monitoring of their own health, can effectively help in preventing disease, promoting fitness, obtaining proper health guidance, promoting communication with doctors, and making decisions regarding medical health (Cline and Haynes, 2001; Lim *et al.*, 2011). As health providers and organizations continue to employ the web to make health information available to the public (Marton and Choo, 2012), the mobile phone, which is a more popular, portable, and personal internet tool, can enable its consumers to seek and subsequently use health information anytime at any place. The low cost of mobile phones and the global popularity of mobile communication networks encourage mobile phone consumers to seek health information whenever needed. This convenience allows people who experience physical or mental discomfort to use their mobile phones to obtain relevant health information before visiting the physician. In addition, mobile phone consumers who seek relevant health information can acquire more health knowledge, understand the diagnosis and treatment for a particular disease, search for drugs, hospitals, or doctors, find relevant patients, and view the experiences of similar patients. Those who seek health information can share their own experiences and knowledge with others as well.

Although a significant portion of the population owns mobile phones and mobile internet is very popular in China, not all of its consumers employ mobile phones or the internet to seek health information. Thus, encouraging people to use mobile phones to seek health information has become an important issue. Several well-known search engines, such as Google, Baidu, and other professional health web sites (e.g. xunyiwenyao.com and haodaifu.com) have extended their services to mobile internet. Microblogs spread health information rapidly as well. However, the quality of information may be the primary factor that affects the seeking and usage behavior of consumers. Perceived value is considered as a competitive advantage in business (Woodruff, 1997), and can be used as an indicator of future behavior (Angelis *et al.*, 2005). As consumers spend time and effort in seeking health information through mobile phones, they would want to obtain relevant information only. Therefore, perceived value can be considered as a predictor of consumer seeking behavior.

In addition, the distinctiveness of health information lies in its specialization, for which only the professionals have sufficient knowledge. Improper use of health information can result in high risks, which can consequently deteriorate the current health status of consumers. Thus, trust can be seen as an important factor for consumers to seek and use health information that are available on the internet. Studies have reported that personal health value is related to consumer health behavior (Tudoran *et al.*, 2009). Considering that health information seeking is part of health behavior, we propose that personal health value can predict the intention of consumers to seek health information through mobile phones. Although numerous studies on health information seeking have emerged (Goetzinger *et al.*, 2007; Rains and Karmikel, 2009; Rooks *et al.*, 2012), they failed to examine the outcomes of the seeking behaviors. Health information usage is also significant because the benefits of the sought information can only be reflected from using it. Furthermore, the aforementioned studies focussed on health information seeking through the internet. As mobile phone has the advantage of seeking health information anytime and anywhere, the mobile context differs from internet context. It is necessary to investigate this issue in another different context. Therefore, this study aims to explore the factors that influence consumer mobile health information seeking (MHIS) and usage behavior based on information quality, perceived value, personal health value, and trust.

This paper is organized into seven sections. Section 2 provides the theoretical background, the research model, and the hypothesis. Section 3 presents the methodology in this study. Sections 4 and 5 provide and discuss the results of hypotheses testing. Section 6 summarizes the implications of our findings for research and practice, as well as the limitations. Finally, the conclusions of this research are presented in Section 7.

2. Literature review and hypothesis development

2.1 MHIS and usage

A study of the internet and American Life Project of the Pew Research Center revealed that Americans seek and use online health information very frequently, and that a number of patients and caregivers would share what they have learned and experienced through mobile devices (Hendrick, 2011). Having penetrated people's daily lives, mobile phones can be used as a convenient means for consumers to seek health information. Sub-healthy individuals could seek health information related to their symptoms and treatment through mobile phones as well, which would reduce waiting time and transportation costs. Such practice causes people to develop better health habits, change their outlook from seeking treatment to disease prevention, and maintain healthy lives in an effective manner (Whittaker and Smith, 2008; Cocosila and Archer, 2010). Researchers have pointed out that health-related issues are very popular on the internet (Wilson and Risk, 2002; Liang *et al.*, 2011), as well as in mobile phones (Xue *et al.*, 2012). Given the personal nature of ownership, mobile phones provide its consumers with a safe and confidential means of seeking health information, particularly health questions concerning gynecological, psychological, cosmetic surgery, and other highly sensitive problems. Based on the definition of health information seeking by Niederdeppe *et al.* (2007), MHIS is defined as the consumers' active efforts to obtain specific health information in response to a relevant event through mobile internet web sites or applications.

Consumers tend to search for health-related web sites and information that were previously unavailable. As a goal-oriented and purposeful activity, MHIS can undoubtedly lead to specific outcomes such as following the medical and health advice

of experts as well as sharing relevant and useful information with others. Collectively, these outcomes can be referred to as the mobile health information usage (MHIU), which refers to consumers' usage behavior concerning health information sought from mobile internet web sites or applications. A majority of studies have reported that the consumers' online health information seeking behavior has the potential to influence the consumers' health behaviors and outcomes (Powell *et al.*, 2011). Given that behavior intention is widely used to demonstrate the adoption construct, this study focusses on the intention of MHIS and MHIU. In the mobile health information context, as consumers seek health information, they will obtain valuable advice or treatment to be followed. In such a case, they will be inclined to use this information. Thus, the following hypothesis is proposed:

H1. Consumers' intention of MHIS is positively related to their intention of MHIU.

2.2 Information quality

As a construct from the model of information systems success developed by DeLone and McLean (1992), a high level of information quality usually results in system usage. Information quality is defined as the fitness for use and reliability of information, which includes information relevance, sufficiency, accuracy, and timeliness (Zhou, 2013). Studies have established the role of information quality in consumers' behaviors in e-health information seeking (Maloney *et al.*, 2005; Lemire *et al.*, 2008). In the mobile health context, consumers want to find healthcare information for a healthy daily life anytime and anywhere. Often, consumers need to obtain information rapidly, such as when they feel sick and do not want to see a doctor. In such cases, consumers prefer to diagnose themselves or even make treatment decisions based on the information they have obtained. Therefore, once they input the symptoms, the relevance, sufficiency, clarity, and accuracy of the available information become very crucial. Following an incorrect information related to the specific symptoms could cause potential physiological and psychological damages (Williams *et al.*, 2003). Given that poor health information could mislead the consumers' healthcare activities and treatment decisions, the following hypotheses are proposed:

H2a. Information quality is positively related to the intention of MHIS.

H2b. Information quality is positively related to the intention of MHIU.

2.3 Perceived value

Perceived value refers to the consumers' overall evaluation of a product or a service (in this case, mobile health information) as regards output (what is gained) and input (what is given) (Zeithaml, 1988). It plays an important role of predicting consumers' future behavior. That is, the higher degree of perceived value can lead to more intense valued behavior intention. Health information helps consumers understand what to expect about symptoms, treatments, experiences, and other related circumstances, which consequently bring value to the consumers. Consumers who use mobile phones to find relevant health information are more informed, and can therefore take more useful preventive measures to prevent deterioration. Moreover, such consumers spend less time talking about basic matters when visiting the doctor. Consumers would become better informed when they gain more knowledge, which would enable them to manage their health better. What's more, doctors could spend less time explaining basic information to their patients when they have sought some relative health information via mobile phone previously.

Previous studies have reported that consumer's perceived value includes several heterogeneous components. A broad approach is offered by Sheth *et al.* (1991), who developed a framework of five dimensions of perceived value: functional value or utilitarian value, social value, emotional value, epistemic value, and conditional value. The influences of different dimensions varied in different fields. Utilitarian value and social value are the key aspects for consumers to make decisions on choosing what products or services. Emotional value focusses on the feelings of consumers, which significantly affects some behaviors closely related to feelings, such as smoking. Epistemic value refers to the novelty aspect of consumer behavior, and conditional value is related to the situation in which consumers made decisions. Based on Goetzinger *et al.* (2007) study, this study adopted three components, namely, social, epistemic, and utilitarian values to examine their impacts on MHIS. Social value refers to the social utility derived from MHIS. People tend to belong in a group, whether online or offline, because they are inherently social. Thus, the perception of belonging to a specific group could enhance the perceived benefits. Consumers should first own a mobile phone which can access internet, because MHIS is a behavior involving seeking health information via mobile phone. Then, they should possess some abilities (not limited to), such as the ability to input keywords, to read the ultimate contents, and to judge the applicability of those contents. All of these abilities are linked to the social status of consumers. Thus, we propose that social value of MHIS is significant for predicting consumers' behaviors. Epistemic value refers to the value obtained from the capability of a product or a service to arouse curiosity, to offer novelty, or to satisfy a desire for knowledge (Sheth *et al.*, 1991). The epistemic value of seeking health information through mobile phones is linked with many factors, such as having an informed participation in the decision making related to health-related issues, having active roles in healthcare, searching for excellent service providers, acquiring a good understanding of treatment possibilities, gathering financial information, and improving coping skills through the social support of other online consumers (Ahmann, 2000). Utilitarian value refers to the value obtained from what the consumers need from a product or a service (e.g. MHIS). MHIS allows the consumers to obtain relevant health information conveniently without having to visit a doctor or medical professional physically and without having to go through obscure medical professional books to find relevant information. Given that information seeking can be performed without time or location constraints, the utilitarian value of MHIS is noteworthy. Therefore, the three dimensions of perceived value are hypothesized to have positive effects on consumers' intention of MHIS:

H3a. Social value is positively related to the intention of MHIS.

H3b. Utilitarian value is positively related to the intention of MHIS.

H3c. Epidemic value is positively related to the intention of MHIS.

2.4 Personal health value

Personal health is undoubtedly very important (Long, 2006). Personal health value refers to the extent to which health is a fundamental end-state. This value is often used to describe the importance of a person's concern for health. Studies have shown that health value is positively related to attitudes toward health behaviors (Moorman, 1994; Smith *et al.*, 1995). In the context of MHIS, consumers who consider their health with utmost importance are more likely to spend more effort on

collecting useful health information through more channels. Thus, the following hypothesis is proposed:

H4. Perceived personal health value is positively related to the intention of MHIS.

2.5 Trust

Trust refers to the willingness to be vulnerable based on the positive expectation toward another party's future behavior (Mayer *et al.*, 1995). According to McKnight and Chervany (2002), trust includes three beliefs, namely, ability, integrity, and benevolence. Ability refers to the knowledge, the skills, and the competence of the person being trusted to conduct the expected actions. Integrity refers to the belief that the person being trusted would act in a reliable manner. Benevolence refers to the extent to which a person being trusted is believed to tend to behave well. Studies have examined the role of trust in consumers' behavior in the contexts of electronic and mobile commerce (Kim *et al.*, 2008; Zhou, 2013). Given that the validity of health information is vital, trust toward information sources is emphasized by consumers (Smith, 2011). However, seeking and using health information through mobile networks and terminals involve uncertainties and risks (Harris *et al.*, 2011). A person's health information should be personal and private because it reflects social behaviors, personal relationships, financial status, and other sensitive information. If particular questionable or unreliable means of treatment or medication are adopted as a result of information interception, for which mobile internet is vulnerable, the consequences could be very serious. If the consumers trust a specific mobile internet web site or application and if they perceive the health information provider to be reliable, then the consumers are more likely to seek the health information provided by this web site or application. In addition, this perception of trust would influence their intention to follow the health advice or make medical decisions. Thus, the following hypotheses are proposed:

H5a. Trust is positively related to the intention of MHIS.

H5b. Trust is positively related to the intention of MHIU.

2.6 Moderating effects of health status

Researchers have reported that adding moderating variables on the research model would increase the contribution of theory development (Dabholkar and Bagozzi, 2002). Health status, including physical and psychological, has been found to moderate significantly the relationships between the patients' behavior intention (satisfaction) and its determinants (interpersonal and organizational dimensions) (Westaway *et al.*, 2003). When a person feels depressed or seriously ill, s/he may be more willing to search for treatment from more channels for the hopelessly optimistic, such as seeking health information through mobile phones and in turn will be more inclined to use this information. That is, the relationship between MHIS and MHIU may be stronger for a seriously ill health status than that of a healthy person. Meanwhile, the consumers will be more relied on the information quality and the value of MHIS, as well as their health value and trust. Thus, the effects of the determinants on the behavior intention of consumers of MHIS vary depending on the health status of the consumer. Accordingly, the following hypotheses are formulated:

H6a-f. Current health status moderates the relationships between intention to seek and its determinants.

H7a-c. Current health status moderates the relationships between intention to use and its determinants.

Based on the hypotheses above, the proposed research model is summarized in Figure 1.

3. Methodology

3.1 Measurement

A survey was conducted to collect data on consumers' perception of health information seeking behavior through mobile phones. All of the instruments used in this study to measure the constructs were adapted from previous studies to guarantee the validity of the results. Items that measure information quality were taken from Kim *et al.* (2008). Social value was measured by items that were adopted from Sweeney and Soutar (2001). Utilitarian and epistemic values were measured by items that were adopted from Goetzinger *et al.* (2007). Personal health value was measured by items that were adopted from Tudoran *et al.* (2009). Trust was measured by items that were adopted from Lee *et al.* (2007). Health status was measured based on psychological and physical health, which were adapted from Westaway *et al.* (2003). The preliminary questionnaire was pretested twice. For the first pretesting, 30 undergraduates majoring in health informatics were invited to read and examine each question. They were then asked to revise the questions that they found ambiguous or improper. Three researchers of health information systems and two practitioners of mobile health business were then interviewed. They were asked to provide feedback on the survey questions and to revise the questions further.

The final questionnaire consisted of two parts. The first part is associated with the respondent's demographic information and their objectives as regards health information seeking through mobile phones. The second part, including the items for constructs, was designed to measure the respondent's perception on each item. All of the items were measured on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The definitions and instructions of the constructs, as well as their sources, are presented in Table I. The specific measures in the questionnaire are shown in the Appendix.

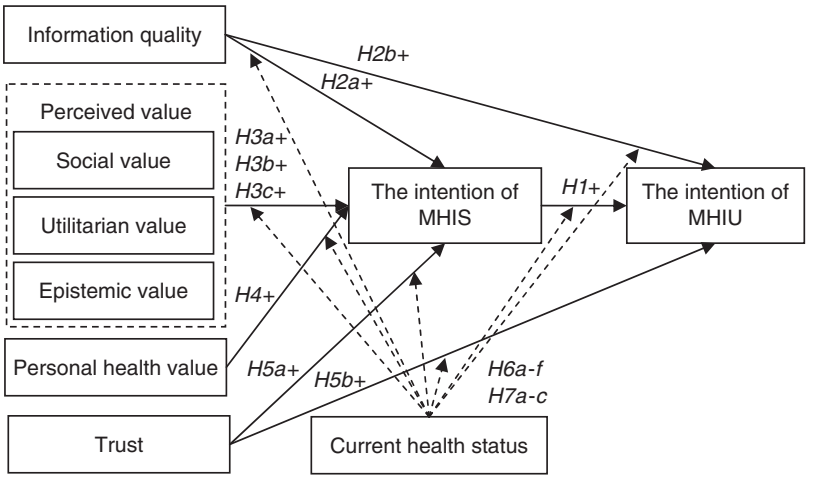

Figure 1.
Research model

Construct	Definition	Number of measurement items	Source
Information quality (INQ)	The quality of the information that was retrieved through MHIS	4	Maltz (2000)
Social value (SOV)	The ability of the consumer to improve his/her social status or approval through MHIS	4	Sweeney and Soutar (2001)
Utilitarian value (UTV)	The ability of the consumer to obtain the needed health information through MHIS	2	Goetzinger *et al.* (2007)
Epistemic value (EPV)	The ability of the consumer to increase his/her knowledge regarding the health-related topic through MHIS	5	Goetzinger *et al.* (2007)
Personal health value (PHV)	Consumers' perceptions on the importance of health	5	Tudoran *et al.* (2009)
Trust (TRU)	Consumers' perceptions on the reliability and general trustworthiness of health information providers	3	Lee *et al.* (2007)
Intention to seek mobile health information (INS)	An individual's behavioral intention to seek health information from mobile internet	3	Taylor and Todd (1995)
Intention to use mobile health information (INU)	An individual's behavioral intention to use health information from mobile internet	3	Taylor and Todd (1995)

Table I.
Research constructs

3.2 Data collecting process

Data were collected from the medical centers of a large public hospital and two university hospitals in central China. Patients who came for physical examinations or to see a doctor for non-serious diseases were selected as respondents based on the assumption that they cared about their health and that they would not be overly disturbed by our survey. We provided free gifts to those who completed the questionnaire. The respondents were either the patients themselves or their family members who are well aware of the health status of the patients. Thus, all of the respondents were regarded as persons interested in seeking health information. After two weeks, the questionnaires were distributed to a total of 300 respondents. All of the responses were scrutinized, and those containing insincere or incomplete responses were discarded because too many values were missing. As a result, a total of 259 usable responses were obtained as data. About 59.1 percent of the respondents are males, whereas 40.9 percent are females. About 71.3 percent of the respondents are less than 60 years old. Majority of respondents (64.1 percent) possess a bachelor's degree. The details of sample characteristics are presented in Table II.

4. Results

A two-step approach of structure equation modeling based on Anderson and Gerbing (1988) was used in this study.

4.1 Measurement model testing results

A confirmatory factor analysis was conducted to examine the validity of the constructs, including convergent validity and discriminant validity, by using the structural

Variable	Count	%
Gender		
Male	153	59.1
Female	106	40.9
Age		
< 18	5	0.19
18-30	33	12.7
31-45	61	23.6
46-60	83	32.1
> 60	77	29.7
Education		
High school	23	8.9
Associate degree	18	6.9
Bachelor's degree	166	64.1
Master's degree or higher	52	20.1
Personal income per year		
< CNY 10,000	18	6.9
CNY 10,000-29,999	26	10.0
CNY 30,000-49,999	74	28.6
CNY 50,000-69,999	39	15.6
CNY 70,000-89,999	33	12.7
CNY 80,000-99,999	37	14.3
> 100,000	32	12.6
Frequency of mobile phone usage		
Several times a day	98	37.8
Once or several times a day	67	25.9
A few times a week	45	17.4
A few times a month or less	22	8.5
Unsure	27	10.4
Awareness of accessing healthcare information via mobile phones		
Never	43	16.6
Sometimes	51	19.7
Often	76	29.3
Very often	89	34.4

Note: $n = 259$

Table II. Sample characteristics

equation modeling software Liserel 8.7. Convergent validity refers to the degree to which items could effectively relate to their corresponding factor, whereas discriminant validity refers to the degree to which items could be related to the factors that are supposed to be unrelated. In addition (Liu, 2015a), composite reliability (CR) and Cronbach's α were adopted to test the reliability of each construct (Liu, 2015b). Items with loadings lower than 0.5 were deleted from the presented results in Table III because the size of the paper is limited. The values of standardized item loadings, average variance extracted (AVE), CRs, and Cronbach's α were acceptable in this study.

The square root of AVE for each factor and its correlation coefficients with other factors were further calculated to measure discriminant validity. The results are summarized in Table IV. The square root of AVE for each factor on the diagonal was larger than its corresponding correlation coefficients with other factors (Liu and Wang,

Constructs	Item	Standard loadings	AVE	CR	Cronbach's α
INQ	INQ1	0.729	0.628	0.835	0.849
	INQ2	0.801			
	INQ3	0.844			
	INQ4	0.675			
SOV	SOV1	0.766	0.613	0.826	0.817
	SOV2	0.739			
	SOV3	0.840			
UTV	UTV1	0.709	0.653	0.788	0.722
	UTV2	0.896			
EPV	EPV1	0.835	0.626	0.878	0.851
	EPV2	0.877			
	EPV3	0.765			
	EPV4	0.672			
PHV	PHV1	0.729	0.643	0.899	0.866
	PHV2	0.764			
	PHV3	0.833			
	PHV4	0.890			
	PHV5	0.784			
TRU	TRU1	0.771	0.699	0.874	0.833
	TRU2	0.899			
	TRU3	0.834			
INS	INS1	0.833	0.747	0.896	0.840
	INS2	0.867			
	INS3	0.795			
INU	INU1	0.891	0.793	0.920	0.899
	INU2	0.913			
	INU3	0.867			

Table III.
Item loadings and validities

	INQ	SOV	UTV	EPV	PHV	TRU	INS	INU
INQ	*0.793*							
SOV	0.331	*0.783*						
UTV	0.467	0.307	*0.808*					
EPV	0.452	0.154	0.503	*0.791*				
PHV	−0.113	0.280	−0.139	0.167	*0.802*			
TRU	0.491	0.295	0.110	0.312	0.211	*0.874*		
INS	0.618	0.153	0.479	0.433	0.147	0.557	*0.864*	
INU	0.536	0.177	0.453	0.425	0.105	0.576	0.676	*0.891*

Table IV.
Correlation matrix and square roots of AVEs

2014), thereby indicating that the measurement model in this study has good discriminant validity.

The model fit of the measurement model was examined, and the results are presented in Table V. All of the fit indices are acceptable based on the suggestions of Hair *et al.* (1998), which implies that the measurement model has a good fit.

Since our sample were collected from the selected users, common method variance (CMV) could exist. Thus we conducted Harman's one-factor test to examine the significance of the CMV (Harman, 1967; Podsakoff *et al.*, 2003). We further performed a factor analysis. The results indicate that the explained variance of each factor is smaller than 20 percent, indicating that the CMV will not influence the results of this study.

4.2 Structural model and moderating testing results

The structural model was examined using a regression method. The proposed model includes eight latent constructs as follows: information quality, social value, utilitarian value, epistemic value, perceived health value, trust, the intention of MHIS, and the intention of MHIU. The effects of the main factors were examined first (model 1). The moderator of health status and the interaction factors were then added (model 2) to test the moderating effects. Table VI shows the multiple regressions on the intention of MHIS and on the intention of MHIU. The results demonstrate that the intention of MHIS, information quality, and trust are positively related to the intention of MHIU, and that the intention of MHIS can be predicted by information quality, utilitarian value, epistemic value, and trust. The significance of the path coefficients of the interacting factors indicate that the current health status can moderate the relationships between information quality and the intention of MHIS, between trust and the intention of MHIS, between the intention of MHIS and the intention of MHIU, and between trust and the intention of MHIU.

Table VII summarizes the results of the main and moderating effects. Among the nine hypotheses of the main effect, seven were supported. Among the nine hypotheses of the moderating effect, four were supported.

Fit	χ^2/df	RMSEA	GFI	AGFI	CFI	NFI	NNFI	IFI
Recommended value	< 3	< 0.08	> 0.90	> 0.80	> 0.90	> 0.90	> 0.90	> 0.90
Value in this study	1.87	0.067	0.91	0.81	0.97	0.96	0.97	0.97

Table V.
Research model fit

	The intention of MHIS		The intention of MHIU	
Independent variable	Model 1	Model 2	Model 1	Model 2
INS			0.45***	0.44**
INQ	0.25**	0.27**	0.13*	0.14*
SOV	0.03	0.03		
UTV	0.17*	0.19**		
EPV	0.11*	0.12*		
PHV	0.08	0.08		
TRU	0.21**	0.23**	0.16*	0.17*
HES		−0.04		−0.09
HES × INS				−0.11*
HES × INQ		−0.10*		−0.06
HES × SOV		–		
HES × UTV		−0.03		
HES × EPV		−0.05		
HES × PHV		–		
HES × TRU		−0.13*		−0.15*
R^2	0.421	0.485	0.672	0.707
ΔR^2		0.064		0.035
ΔF		30.695***		29.983***

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table VI.
Multiple regressions on the intention of MHIS and the intention of MHIU

Effect	Hypothesis	Path	Regression coefficients	Result
Main effect	*H1*	INS→INU	0.45***	Y
	H2a	INQ→INS	0.25**	Y
	H2b	INQ→INU	0.13*	Y
	H3a	SOV→INS	0.03	N
	H3b	UTV→INS	0.17*	Y
	H3c	EPV→INS	0.11*	Y
	H4	PHV→INS	0.08	N
	H5a	TRU→INS	0.21**	Y
	H5b	TRU→INU	0.16*	Y
Moderating effect	*H6a*	HES × INQ→INS	−0.10*	Y
	H6b	HES × SOV→INS	–	N
	H6c	HES × UTV→INS	−0.03	N
	H6d	HES × EPV→INS	−0.05	N
	H6e	HES × PHV→INS	–	N
	H6f	HES × TRU→INS	−0.13**	Y
	H7a	HES × INS→INU	−0.11*	Y
	H7b	HES × INQ→INU	−0.06	N
	H7c	HES × TRU→INU	−0.15*	Y

Notes: Y, support; N, not support. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table VII.
Results of the main and moderating effects

5. Discussion

The main purpose of the study is to explore how the determinants in the proposed research model can predict consumers' intention to seek and use health information through mobile phones. This study is believed to provide insight into the management strategies of providing mobile health information and health knowledge promotion. We have the following findings.

First, as hypothesized, information quality, perceived value, and trust significantly affect the intention to seek mobile health information, with information quality having the greatest effect and a regression coefficient of 0.25. This finding suggests that health consumers' intention to seek mobile health information is mostly influenced by information quality. When consumers perceive the information quality of a mobile internet web sites or applications to be high, they would be more likely to seek health information from these web sites. Trust has a slightly lower effect than information quality, which indicates that the trustworthiness of the information provider has an important effect on the seeking behavior intention of consumers as well. The dimensions of perceived value, including utilitarian, and epistemic values, are also important determinants of consumers' seeking intention. However, personal health value has an insignificant effect. The probable reason for this finding is that the selected subjects are comprised of people who go to the hospital, which suggest that most of them have already realized the importance of health. Consequently, the perceptions of the respondents for personal health value are not significantly different, which results in an insignificant effect.

Second, the impact of consumers' intention to seek health information through mobile phones on the intention to use is confirmed, and information quality and trust are positively related to the intention to use as well. Intention to seek has the largest effect, which supports the statement that health information seeking behavior is positively related to health behavior outcomes (Anker *et al.*, 2011). Thus, increasing the intention of seeking behavior through information quality, perceived value, and trust is

an effective way of encouraging consumers to use health information found in mobile internet web sites or applications. Furthermore, the effects of information quality and trust on intention to use are supported in this study, which indicates that a high degree of information quality and consumers' trustfulness results in a high probability that consumers will share the information with others and adopt the recommended health or medical treatment advice, which consequently enhance the levels of consumers' health.

Third, among the dimensions of perceived value, utilitarian, and epistemic values have a significant effect on seeking intention, whereas the effect of social value is insignificant. The main reason for this result is that mobile phones, particularly smart phones, are commonly used. Hence, the type of service that people choose would perhaps not attract the attention of others. Thus, the effect of social value is considered insignificant.

Fourth, the results show that consumers' current health status significantly moderates the relationship between trust and intention to seek and between trust and intention to use. Trust is therefore regarded as an important factor for consumers with poor health conditions to seek health information through mobile phones. Studies have claimed that trust has a more crucial effect in a mobile context than in an internet context (Cho *et al.*, 2007). The results in this study further highlight that for people with mental or physical illness, trust is much more important in forming both the consumers' health information seeking behavior and their health information usage behavior in a mobile environment. Considering that consumers with serious diseases may have already tried numerous treatment solutions, they are inclined to try any solution they can find from a more trusted health information providers. Thus, trust has a greater effect for them than for healthy consumers with regard to mobile health information. Current health status also moderates the relationship between the intention to use and the intention to seek, that is, consumers in a worse health condition would have high intention to use the information they obtained from mobile phones, which indicates their eagerness to improve their health by using information sought from mobile phones.

6. Implications and limitations

This study examines the factors that influence consumers' intention of health information seeking and usage via mobile phone, which is the first study in Chinese MHIS and MHIU context. As mentioned above, previous studies have primarily focussed on online health information seeking behavior, while a few of these studies have examined the seeking behavior intention and the usage behavior intention in a general model. The results indicate that health information usage behavior intention is closely related to the seeking behavior intention in the mobile context, which enriches the research on the relationship between information seeking and its outcomes. Furthermore, this study highlights the significant impact of information quality, perceived value, and trust on the intention to seek, and the significant impacts of information quality and trust on the intention to use, which have been overlooked in previous studies on MHIS. Thus, this study provides a richer understanding of the prediction of health information seeking behavior intention and its outcome. In addition, our results demonstrate that consumers with poorer health status rely heavily on the trustworthiness of the providers and information quality in seeking health information through mobile internet. Similarly, the trust of consumers on the provider influence their decisions on whether they should follow treatment solutions and whether they should share the information with others. Therefore, health information seeking researchers should pay more attention to the importance of trust and information quality.

This research has important implications for practice as well. The task of mobile health providers or medical organizations to attract consumers to enter their homepage, interact with them, and adopt the health and medical treatments can be very challenging. As suggested by this work, information quality is the most significant factor that affects consumers' MHIS behavior intention, and it influences usage intention as well. Thus, mobile health providers should focus more on the accuracy, sufficiency, relevance, and timeliness to ensure the quality of the health information. In addition, providers should satisfy consumer's value by offering fair and reliable functions and suitable user-friendly interface for mobile phones.

Trust is confirmed to be important for both seeking intention and usage intention, which implies that health information providers or organizations should improve on the trust given by consumers to attract more new consumers. Trust can be improved by establishing an impression that information providers are honest to their consumers and that they care about their needs. Finally, consumers with a poor health status are influenced by the trustworthiness of providers and information quality in deciding whether to seek health information through mobile phones. Moreover, they are influenced by trust to a greater extent when they intend to share the information with others or when making health or medical decisions. Mobile health information providers should pay more attention to patients in unhealthy conditions and provide accurate and rich content for them.

Nevertheless, this study presents specific limitations as well. First, this study was conducted in China, where mobile health is developing but is still in its early stage. Therefore, the results in this study need to be generalized to other countries where mobile phones are widely used for public health consumers to manage health development. Second, the explained variance of intention to seek is less than 50 percent. Thus, other factors may be associated with health consumers' intention to seek mobile health information, such as consumers' health knowledge background. Further research should be conducted to examine these aspects.

7. Conclusion

This study has the following contributions: first, the factors that influence health consumer's intention behavior in a mobile internet context in China were examined, which is significant to this area of research. Second, both the health information seeking behavior intention and the usage intention were examined. Seeking is the tool of obtaining health information, and using this information to improve health is the ultimate purpose. Thus, this study extends health information seeking to usage. Third, we included the current health status as the moderator, which contributed to the research on information seeking and usage behavior.

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(See Appendix follows overleaf.)

Appendix. Construct measurements

Information quality

The mobile web sites provided health information relevant to my needs.
The mobile web sites provided sufficient health information.
The mobile web sites provided accurate health information.
The mobile web sites provided up-to-date health information.

Social value

People who seek mobile health information obtain social approval.
People who seek mobile health information have a certain level.
Seeking health information from mobile phone has improved the way others perceive me.
There are a lot of people I know are seeking health information from mobile phone.

Utilitarian value

I got exactly the information I wanted from mobile health information.
While seeking mobile health information, I found just the information I was looking for.

Epistemic value

The quality of mobile health information influences my knowledge of health.
The contents of mobile health information influence the level of my knowledge about health.
The quality of mobile health information influences the level of my knowledge about health.
The guidance received from mobile health information affects the level of my knowledge about health.
I learn new things from mobile health information.

Personal health value

I take care of myself as a matter of principle.
I am willing to make daily sacrifices for good health.
There is nothing more important than good health.
Good health is only of minor importance in being happy.
If you do not have health, you do not have anything.

Trust

I believe that mobile web site is honest.
I believe that this web site cares about its customers all the time.
I believe that this web site is dependable.

Intention to seek

I have a high intention to seek health information through mobile phone.
I will seek health information through mobile phone in the near future.
I will recommend others to seek health information through mobile phones.

Intention to use

I will share the information with others.
I will make a health or medicine-related decision according to the information I sought from mobile phone.
I will recommend others to use the mobile health information.

Table AI. Psychological health status

Scale	1	2	3	4	5
Degree	Very poor	Poor	Normal	Good	Very good

Table AII. Physical health status

Scale	1	2	3	4	5
Degree	Very poor	Poor	Normal	Good	Very good

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