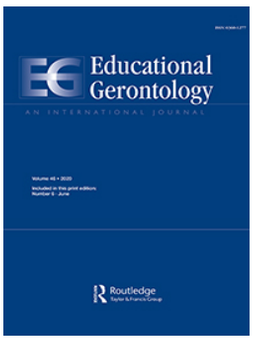

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Investigating older adults' intention to learn health knowledge on social media

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ABSTRACT

Abundant health knowledge resources are available on social media to facilitate technology-enhanced knowledge learning among older adults. The objective of this study is to investigate the predictors and the underlying formation mechanism of older adults' intention to learn health knowledge on social media. We propose a novel model to examine how older adults' emotional state (i.e., health anxiety) and cognitive state (i.e., e-health literacy) during knowledge acquisition influence threat appraisal (i.e. perceived severity and perceived susceptibility) and coping appraisal (i.e. self-efficacy and perceived benefits), thereby shaping older adults' intention to learn health knowledge. Survey data from 337 Chinese older adult users of social media was collected to test the research model. Results reveal that perceived susceptibility, self-efficacy and perceived benefits exert positive effects on older adults' health knowledge learning intention, while the impact of perceived severity on health knowledge learning intention is not statistically significant; health anxiety is positively correlated with perceived severity and perceived susceptibility, and e-health literacy is a powerful predictor of self-efficacy and perceived benefits. This paper enriches the literature related to technology-enhanced knowledge learning and online health behavior among older adults. Effective strategies are proposed based on the findings for practitioners dedicated to promoting health knowledge via social media and older adults who apply health knowledge to address health-related needs.

Introduction

Information communication technology has transformed today's aging society (United Nations, 2017), especially in terms of how older adults manage their health (Freund et al., 2017). Given the ubiquity of the internet and the emergence of new mediums, offline healthcare professionals are no longer the sole source of health knowledge for older adults. The convenience and low costs of social media platforms such as Facebook, Twitter, WeChat, and Weibo have gradually become venues for older adults to acquire and learn health knowledge as needed (X. Zhang et al., 2017). For example, the Public Accounts function embedded in WeChat, China's popular social media platform, enables more than 50 million older adult users to access published health-related knowledge (Tencent and CASS, 2018), thus providing new opportunities for older adults to receive health guidance.

Health knowledge learning activities can benefit health knowledge providers on social media and older adults, who are important recipients of such knowledge. For health knowledge providers, understanding the essence behind health knowledge activities may help them cultivate user habits and retain users. For older adults, being well-equipped with health knowledge may facilitate them to cope with changes in their physical functioning (Hardt & Hollis-Sawyer, 2007), improve their overall quality of life, and reduce their dependence on medical and welfare services (Duay & Bryan, 2008). Thus, to more

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effectively realize the vision of health knowledge providers and older adults, key insights are needed to illuminate older adults' health knowledge learning via social media.

However, the key scientific issue has rarely been examined in prior studies. The current study aims to address the aforementioned critical knowledge gap by answering the following research questions: (1) What are the powerful predictors of older adults' intention to learn health knowledge on social media? (2) What is the underlying mechanism from health knowledge acquisition to the formation of health knowledge learning intention? The findings of this study are expected to offer implications for health knowledge providers on social media regarding how health-related content can be developed effectively and also empower older adults to better address their personal health needs.

Research background and related literature

Technology-enhanced learning

A wealth of research has considered younger generations, such as by exploring the association between participation in internet-based learning and variables related to learning strategies (Lin et al., 2017), the characteristics of educational materials (Kay, 2012) and the introduction of gamification elements (González et al., 2016). The research community has also recognized the importance of the older adults by studying why they continue learning after retirement (Kim & Merriam, 2004). Relatively less interest surrounds older adults' learning supported by internet technology (Xiong & Zuo, 2019), also known as technology-enhanced knowledge learning (Ruiz et al., 2006; Sun et al., 2008). Yet technology-enhanced learning activities, especially those that are non-instructional and self-regulated by learners (e.g., learning health knowledge on social media according to personal needs) and may occur through observation, interaction with others or internet browsing (Ebner et al., 2010), have permeated older adults' lives. Corresponding theoretical understanding is therefore needed.

Health knowledge on social media

Traditionally, health knowledge comes primarily from conventional healthcare professionals. Yet social media has changed how health knowledge is generated and disseminated in a network environment (Li et al., 2018). A growing number of health organizations and individuals have registered social media accounts, and publicize health-related knowledge that subscribers can receive (Li et al., 2018; X. Zhang et al., 2017). Importantly, however, knowledge acquisition is merely a starting point; only through experiencing learning can competence and understanding be achieved.

Health knowledge on social media facilitates the learning activity to occur. Particularly for older adults, if they could learn health knowledge acquired via social media and transform it into internal knowledge, they may have more control over the factors that could produce an effect on the aging health status (Hardt & Hollis-Sawyer, 2007). Notably, unlike health knowledge offered by regular healthcare professionals, health knowledge providers on social media cite various sources and topics related to health; these trends exemplify the user-generated nature and inherent non-customization of such knowledge (Y. Zhang et al., 2019). It signifies people may experience uncertainty when encountering knowledge without adequate quality assurance, so careful appraisal is required before using health knowledge to engage in health-related behaviors (Mou et al., 2016).

Health belief model

The health belief model (HBM) initially extended the use of variables in social psychology to the explanation of preventive health behavior, and analyzed why people take preventive measures or attempt to control their health conditions (Maiman & Becker, 1974; Rosenstock, 1974). Variables in HBM, such as perceived severity, perceived susceptibility, perceived benefits and self-efficacy, have been identified as important predictors of behavioral intention for prevention purposes and have often been used to

evaluate people's motivations behind health-related decisions (Janz & Becker, 1984; McKinley & Ruppel, 2014; Mou et al., 2016).

The health knowledge learning activity in this paper is oriented toward prevention in a social media context given learners' goals of avoiding disease or protecting themselves from disease-related decline. As such, HBM is an appropriate model to better understand the mechanism underlying the process of appraisal to the formation of health knowledge learning intention among older adults.

Factors influencing health knowledge appraisals

Studies have revealed factors that influence individuals' appraisal of health knowledge from cognitive and emotional state, respectively. For example, as for emotional state, individuals with high health anxiety are frequent seekers of health knowledge, and one's level of health anxiety affects their appraisal of health threats (Baumgartner & Hartmann, 2011; Hadjistavropoulos et al., 1998). In addition, individuals with higher e-health literacy are often considered potential recipients of health knowledge given their high cognitive abilities (Norman & Skinner, 2006). Individuals' appraisal toward competence and effectiveness in performing actions that address health threats are closely related to e-health literacy (Mitsutake et al., 2016). Inspired by Myrick (2017), an inquiry into the antecedents of health knowledge appraisal should consider the integration of emotional and cognitive components. Under this theoretical lens, factors that influence older adults' active appraisal of health knowledge should be considered in light of the emotional and cognitive aspects of their experiences.

Research model and hypotheses

The research model guiding this study is illustrated in Figure 1. Inspired by Myrick's (2017) work, this model posits that emotional and cognitive state influences older adults' appraisal of health-related knowledge. Specifically, we propose health anxiety as these individuals' emotional state and e-health literacy as their cognitive state. Older adults' intention to learn health knowledge are influenced by their appraisal of health knowledge in our model. On the basis of HBM, the appraisal

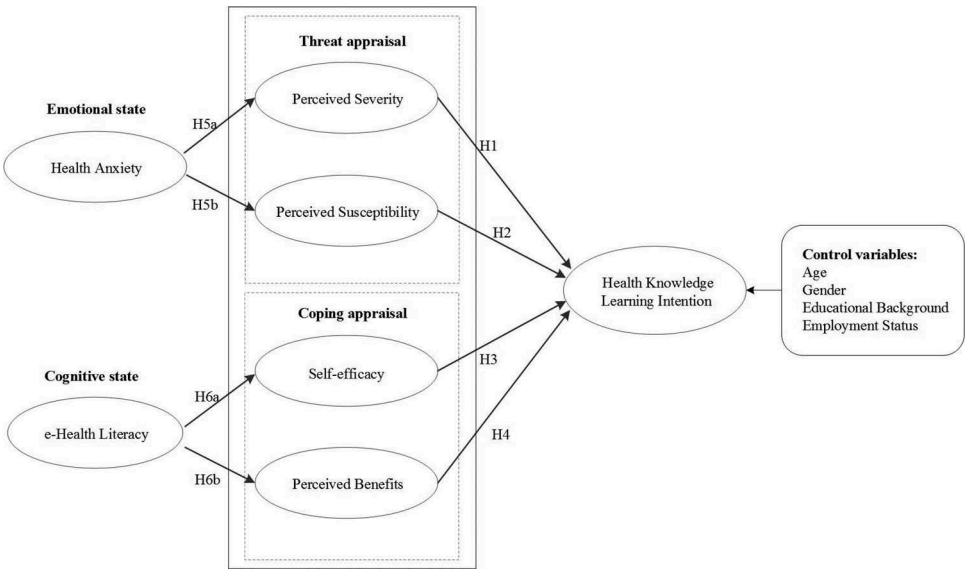

Figure 1. Research model.

Note: ***: $P < .001$; **: $P < .01$; *: $P < .05$; n.s.: not significant.

of health knowledge in this paper includes health threat appraisal (i.e., perceived severity and perceived susceptibility) and coping appraisal (i.e., self-efficacy and perceived benefits). Control variables are also considered, including age, gender, educational background, and employment status. We chose these control variables because the literature suggests they may influence older adults' learning intention (Kim & Merriam, 2004).

Predictors of health knowledge learning intention

HBM is adopted as the overarching theory to elucidate the impact of appraisal of health knowledge on older adults' intention to learn such knowledge. This model asserts that individuals refer to two main components when determining whether to perform health-related behaviors: (1) threat appraisal of health issues, generally including perceived severity and perceived susceptibility; and (2) appraisal of coping with a given threat, such as the feasibility and effectiveness of implementing health behaviors, including perceived barriers and perceived benefits (Dodel & Mesch, 2017; Maiman & Becker, 1974). Among these, self-efficacy is often understood as a special aspect of perceived barriers (Janz & Becker, 1984).

Similar to Glanz et al. (2008), we define perceived severity as an individual's belief about the seriousness of consequences tied to specific health issues. A strong belief in the seriousness of such consequences increases an individual's tendency to engage in related protective behavior to avoid negative health outcomes (Dodel & Mesch, 2017). In our context, when confronted with health knowledge on social media, older adults will appraise the seriousness of consequences associated with certain health issues (i.e., measuring their dependence on medical care, pain intensity, or disability rate). High perceived severity levels of consequences may enhance older adults' positive behavioral intention to learn what health knowledge suggests. Therefore, we propose the following hypothesis:

H1. Perceived severity has a positive effect on older adults' intention to learn health knowledge on social media.

Perceived susceptibility here refers to an individual's belief about the likelihood of contracting health issues (Maiman & Becker, 1974). Evidence shows that perceived susceptibility to given health issues is significantly related to the implementation of preventive behaviors against the health threats (Mou et al., 2016). Similarly, older adults may evaluate the self-relevance of certain health issues. The more likely older adults are to experience given health issues, the more likely they are to engage in related coping measures (i.e., to learn what health knowledge suggests). Accordingly, a high level of perceived susceptibility may increase their intention to learn, as indicated by our second hypothesis:

H2. Perceived susceptibility has a positive effect on older adults' intention to learn health knowledge on social media.

Self-efficacy, as a special aspect of perceived barriers (Janz & Becker, 1984), is one's confidence or belief about their competence to perform a particular behavior to cope with health threats (Bandura, 1998). Individuals with stronger self-efficacy are more likely to exhibit more willingness to take actions to achieve their goals (McKinley & Ruppel, 2014). Regarding older adults' decision making related to health knowledge learning, perceptions of self-efficacy (e.g., assessing their learning abilities, facilitating conditions, and potential challenges) are particularly crucial as older adults tend to examine their current circumstances before initiating learning behaviors. As the complexity of learning increases, older adults may feel that more time, greater effort to learn, and a wider knowledge base are needed to complete learning tasks. Older adults' greater confidence in their learning competence may therefore positively influence their intention to learn health knowledge. Thus, we propose the following hypothesis:

H3. Self-efficacy has a positive effect on older adults' intention to learn health knowledge on social media.

The construct perceived benefits refers to the perception of expected benefits resulting from performing a particular behavior to cope with health threats (Maiman & Becker, 1974). A recommended action will not be adopted unless it is considered advantageous (Rosenstock, 1974). In our context, perceived benefits involve older adults' appraisal of the effectiveness of learning health knowledge, such as the extent to which health risks decrease or how effectually health conditions are managed through learning. Greater perceived benefits from practicing the learning activity will promote older adults' intention to learn health knowledge on social media. Hence, we propose the following hypothesis:

H4. Perceived benefits have a positive effect on older adults' learning intention for health knowledge on social media.

Predictors of health knowledge appraisals

Health anxiety

Health anxiety, a manifestation of individuals' emotion, can be defined as a persistent fear of illness wherein individuals often interpret physical symptoms as signs of illness (Lagoe & Atkin, 2015). Hadjistavropoulos et al. (1998) explored the reaction of people with different levels of health anxiety to diverse diagnostic knowledge. Results show that individuals with higher health anxiety interpreted such knowledge more negatively and believed they were at greater risk of complications. Baumgartner and Hartmann (2011) investigated how people who are anxious about their health respond to online health knowledge and health anxiety was found to be associated with negative reactions to online health knowledge.

In light of the above inferences, we conclude that people who are more anxious about their health have a more negative understanding of acquired health knowledge. Further, people with high health anxiety perceive given health issues as more catastrophic and consider themselves more likely to experience similar symptoms. In general, older adults' concerns about their health conditions are relatively stronger due to physical and psychological aging, and health-related anxiety manifests on multiple levels. Within this context, older adults with higher health anxiety interpret health issues described in health knowledge as having more serious consequences than people with lower health anxiety. Higher perceived health anxiety, wherein older adults consider themselves at risk of developing a given disease, is also positively related to greater perceived susceptibility. Accordingly, we propose the following hypotheses:

H5a. Health anxiety has a positive effect on perceived severity.

H5b. Health anxiety has a positive effect on perceived susceptibility.

E-health literacy

E-health literacy is a manifestation of older adults' cognitive reaction to health knowledge, defined as these individuals' ability to seek, discover, understand, and evaluate health knowledge from electronic resources (Norman & Skinner, 2006). E-health literacy is often taken as an indicator to promote people's health (Xie, 2011). Comprehending what online health knowledge conveys, and practicing what it suggests, is challenging for people who lack e-health literacy, especially older adults (Martins et al., 2015). Higher levels of e-health literacy appear associated with greater motivation and ability to use the internet to learn health knowledge for health-related purposes (Bodie & Dutta, 2008). Moreover, individuals possessing high e-health literacy tend to express a clear understanding of

the competence and benefits tied to possessing online health knowledge; such comprehension enhances their motivation to perform health-related behaviors (Mitsutake et al., 2016).

E-health literacy enables individuals to accumulate positive health performance of desired behaviors. This behavioral pattern is conducive to experience that promote success while avoiding situations that could lead to failure, thus actively influencing self-efficacy. Simultaneously, individuals with higher e-health literacy demonstrate a more accurate scientific understanding of how to maintain health by learning health knowledge online and interpret implementing learning practice as realizing positive outcomes (Martins et al., 2015). Older adults possess stronger self-efficacy around learning health knowledge if they perceive themselves as having higher e-health literacy. Moreover, because older adults with high e-health literacy believe they know how to answer their own health-related questions and guide their health behaviors according to the learned health knowledge, they may believe more benefits can be gained from these learning experiences. Therefore, we propose the following hypotheses:

H6a. E-health literacy has a positive effect on self-efficacy.

H6b. E-health literacy has a positive effect on perceived benefits.

Methods

Measures

To test the proposed model, one online questionnaire was developed, in which there were seven constructs. All measurement items for constructs were adapted from the existing literature to fit the present research context. Items adapted from Gan and Li (2018) were used to measure health knowledge learning intention. Perceived severity, perceived susceptibility, self-efficacy and perceived benefits were measured using scales derived from Mou et al. (2016) and Ng et al. (2009), and items for health anxiety were selected from Lagoe and Atkin (2015). Measurements on e-health literacy were adapted from Norman and Skinner (2006). Each item used the Likert-5 subscale (1 = strongly disagree, 5 = strongly agree).

Four experts were invited to review the adapted instrument. The instrument was translated into Chinese to make it easier for respondents to understand because the survey was conducted in China. A back-translation method, which is appropriate for cross-cultural research, was adopted to ensure the validity of the translation (Brislin, 1970). Before the formal version of the questionnaire was generated, thirty older adults who are well-versed in using social media participated in a pilot survey and were encouraged to offer feedback about the structure and written expression of the questionnaire. We considered their responses when revising the questionnaire to develop the final version, which was then used for the formal survey. Measurement items for each construct are presented in Table 1.

Data collection and respondents

The formal online survey for older adult users of social media was conducted in China from June 26 to July 19, 2018. Consistent with the existing literature on older adults' use of social media and online health behavior, people older than age 50 were recruited as respondents (e.g., Guo, 2017; Silver, 2015). A total of 406 responses were received, and those with age mismatches or excessively brief response times were excluded. Ultimately, 337 valid responses were retained for further analysis. Table 2 lists respondents' demographics. The demographic characteristics of older adults in our study are similar to the statistics of Mobile Internet Report of Older Adult Users (Sohu, 2018), indicating the sample is representative.

Table 1. Scale items.

Constructs	Items
Health Knowledge Learning Intention (HKLI) (Gan & Li, 2018)	HISI1. I want to learn health knowledge that I am interested in on social media. HKLI2. I plan to learn health knowledge on social media. HKLI3. I want to learn health knowledge provided by social media.
Perceived Severity (PSV) (Mou et al., 2016; Ng et al., 2009)	PS1.The consequences of the health issues described in health knowledge on social media are serious. PS2.If I experience the health issues described in health knowledge on social media, the consequences will be serious. PS3.If the health issues described in health knowledge on social media happen to me, the consequences may be serious.
Perceptual Susceptibility (PSC) (Mou et al., 2016; Ng et al., 2009)	PSB1. The health issues described in health knowledge on social media are likely to happen to me. PSB2. There is a good possibility that I will experience the health issues described in health knowledge on social media. PSB3. I am likely to face the health issues described in health knowledge on social media.
Self-efficacy (SE) (Mou et al., 2016; Ng et al., 2009)	SE1. I think I can learn health knowledge on social media. SE2. I am confident to learn health knowledge on social media. SE3. I believe I am capable of learning health knowledge on social media.
Perceived Benefits (PB) (Mou et al., 2016; Ng et al., 2009)	PB1. Learning health knowledge on social media may be a way to reduce my health risks. PB2. Learning health knowledge on social media may be useful for managing my health. PB3.Learning health knowledge on social media can enhance my effectiveness in managing my health. PB4. Learning health knowledge on social media may be beneficial to my health.
Health Anxiety (HA) (Lagoe & Atkin, 2015)	HA1. I spend most of my time worrying about my health. HA2. I am always afraid that I will get a serious disease. HA3. I usually think I have a high risk of diseases.
e-Health Literacy (EHL) (Norman & Skinner, 2006)	EHL1. I know how to use health knowledge on social media to answer my health questions. EHL2. I know what kind of health knowledge on social media is available. EHL3. I can distinguish the quality of health knowledge on social media before using it. EHL4. I am confident that I can use the health knowledge on social media to make better health decisions. EHL5. I know where to find useful health knowledge from social media.

Results

Analysis of our results included the assessment of common method bias along with an evaluation of the measurement model and the structural model. We used Smart PLS software to test the reliability and validity of constructs. We adopted the partial least squares (PLS) algorithm, which is suitable for exploratory research and appropriate for our research setting, to estimate the relationships between constructs (Chin et al., 2003). The bootstrapping technique was employed to test the significance levels of paths in the structural model.

Common method bias

We used Harman's single factor test (Podsakoff & Organ, 1986) to estimate common method bias. The variance of the first factor was 27%, which could not generate a single dominant factor, indicating no serious common method bias in our data.

Measurement model

Construct reliability, convergent validity, and discriminant validity were used to evaluate the measurement model (Straub et al., 2004). As displayed in Table 3, all Cronbach's alpha and composite reliability values exceed the threshold of 0.7 (Bagozzi & Yi, 1988), indicating sound reliability. The average variance extracted (AVE) values of all constructs are beyond the cutoff of 0.5 (Fornell & Larcker, 1981). Factor loadings are greater than 0.7, within the acceptable range. Thus, each construct demonstrates qualified convergent validity (Nunnally & Bernstein, 1994).

Table 2. Demographics of the respondents (N = 337).

Demographics	Items	Frequency	Percentage (%)
Gender	Male	176	52.2%
	Female	161	47.8%
Age	51–55	178	52.8%
	56–60	70	20.8%
	61–65	64	20.0%
	66–70	12	3.6%
	>70	13	3.8%
Educational background	Less than Junior High School	86	25.5%
	Senior High School/Technical secondary school	119	35.3%
	Three years of college	89	26.4%
	Four years of university	36	10.7%
	Post–graduate	7	2.1%
Employment status	Unemployed	48	14.2%
	Employed	97	28.8%
	Retired	192	57.0%

Discriminant validity is used to measure whether constructs can be distinguished effectively. Table 4 demonstrates that the square roots of AVE values for all constructs (on the diagonal in bold) are greater than the correlations between constructs, thus verifying our scale's discriminant validity.

Structural model

Results analysis including explanatory power, path coefficients and significance levels of the hypotheses are shown in Figure 2. The explanatory power of independent variables on health knowledge learning intention is 60.7% (R^2 = 0.607).

Table 5 illustrates the results of the hypothesis testing. Results show that perceived susceptibility, self-efficacy, and perceived benefits positively influence health knowledge learning intention, indicating H2, H3, and H4 are supported. Supporting H5a and H5b, the positive impacts of health

Table 3. Reliability and convergent validity.

Construct	Item	Factor loadings	Composite reliability	AVE	Cronbach's alpha
EHL	EHL1	0.825	0.909	0.713	0.866
	EHL2	0.814			
	EHL3	0.881			
	EHL4	0.857			
	EHL5	0.844			
HA	HA1	0.874	0.895	0.740	0.824
	HA2	0.870			
	HA3	0.837			
HKLI	HKLI1	0.903	0.936	0.831	0.898
	HKLI2	0.916			
	HKLI3	0.916			
PSC	PSC1	0.890	0.923	0.800	0.875
	PSC2	0.889			
	PSC3	0.904			
PSV	PSV1	0.865	0.920	0.794	0.870
	PSV2	0.901			
	PSV3	0.906			
PB	PB1	0.862	0.934	0.778	0.905
	PB2	0.899			
	PB3	0.889			
	PB4	0.879			
SE	SE1	0.887	0.931	0.819	0.889
	SE2	0.904			
	SE3	0.924			

HKLI = Health Knowledge Learning Intention; PSV = Perceived Severity; PSC = Perceived Susceptibility; SE = Self-efficacy; PB = Perceived Benefits; HA = Health Anxiety; EHL = E-health Literacy.

Table 4. Discriminant validity.

	EHL	HA	HKLI	PSC	PSV	PB	SE
EHL	**0.844**						
HA	0.297	**0.860**					
HKLI	0.489	0.356	**0.912**				
PSC	0.407	0.428	0.440	**0.894**			
PSV	0.266	0.486	0.457	0.393	**0.891**		
PB	0.430	0.384	0.332	0.518	0.429	**0.882**	
SE	0.403	0.406	0.466	0.505	0.423	0.338	**0.905**

Diagonal elements (in bold) are the square root of the average variance extracted of each construct. Off-diagonal elements are correlation coefficients between constructs.

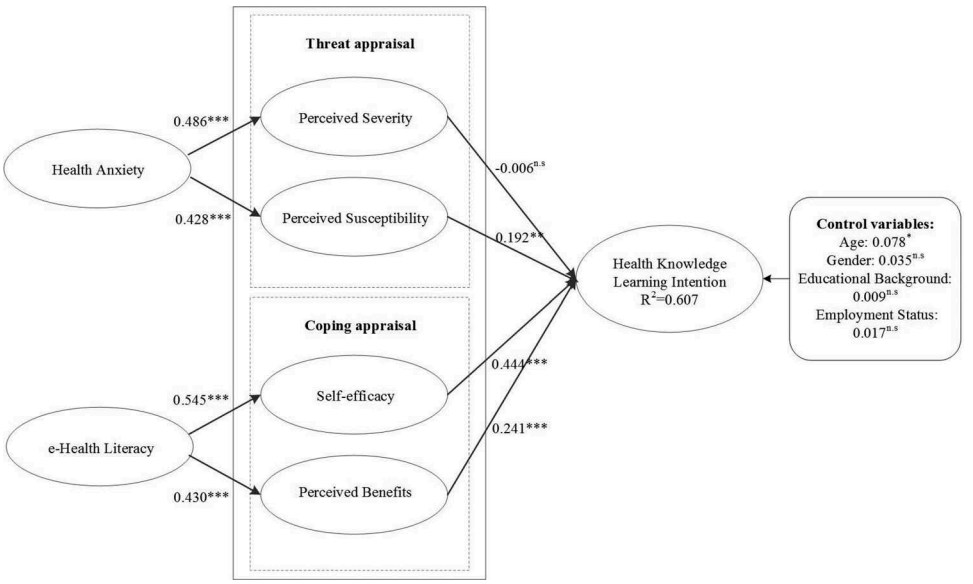

Figure 2. Analysis results of the proposed model.

Table 5. Results of hypothesis testing.

Hypothesis	Path	Path Coefficient	t-statistic	p-value	Hypothesis validation
H1	PSV→HKLI	−0.006	0.114	0.910	Not supported
H2	PSC→HKLI	0.192	2.526	0.012	Supported
H3	SE→HKLI	0.444	4.492	0	Supported
H4	PB→HKLI	0.241	2.986	0.003	Supported
H5a	HA→PSV	0.486	9.239	0	Supported
H5b	HA→PSC	0.428	7.499	0	Supported
H6a	EHL→SE	0.545	10.626	0	Supported
H6b	EHL→ PB	0.430	6.737	0	Supported

HKLI = Health Knowledge Learning Intention; PSV = Perceived Severity; PSC = Perceived Susceptibility; SE = Self-efficacy; PB = Perceived Benefits; HA = Health Anxiety; EHL = E-health Literacy.

anxiety on perceived severity and perceived susceptibility are also confirmed. E-health literacy is a positive predictor of self-efficacy and perceived benefits, supporting H6a, H6b. However, the impact of perceived severity on the health knowledge learning intention is not statistically significant, showing H1 is not supported. Among all the control variables, only age has a significant effect on health knowledge learning intention.

Table 6. Mediation analysis.

			Indirect effect			Direct effect			
IV	MV	DV	Lower bound (2.5%)	Upper bound (97.5%)	Zero included?	Lower bound (2.5%)	Upper bound (97.5%)	Zero included?	Mediation
HA	PSC	HKLI	0.017	0.154	No	−0.002	0.168	Yes	Full mediation
EHL	SE	HKLI	0.131	0.361	No	0.245	0.463	No	Partial
EHL	PB	HKLI	0.038	0.197	No	0.245	0.463	No	mediation

IV = Independent Variable; MV = Mediating Variable; DV = Dependent Variable.

We also adopted Bootstrapping approach to test the mediation role of perceived severity, self-efficacy, perceived benefits. In the current study, 5000 bootstrap resamples were used to obtain the 95% confidence interval of indirect effects. Table 6 lists the results of the mediation effect analysis. According to the results, the indirect effect of health anxiety on health knowledge learning intention is significant, while the direct effect is not statistically significant. As a result, perceived susceptibility plays a full mediation role in the relationship between health anxiety and health knowledge learning intention. Meanwhile, the indirect effect of e-health literacy on health knowledge learning intention is significant, so self-efficacy and perceived benefits have a partial mediation effect on the influence of e-health literacy on health knowledge learning intention. By observing the significance levels of both direct and indirect effects, it concludes that the effect of e-health literacy on health knowledge learning intention is partially mediated by self-efficacy and perceived benefits.

Discussion

Main findings

The main findings of this study are as follows. First, in terms of threat appraisal, perceived susceptibility positively influences older adults' intention to learn health knowledge, whereas the relationship between perceived severity and older adults' intention to learn health knowledge is not statistically significant. This finding suggests that one's perceptions of susceptibility to given health issues are positively related with the implementation of preventive behaviors against relevant health threats. The insignificant association between perceived severity and health knowledge learning intention may be attributable to the severity of the consequences causing distraction in older adults.

Second, in terms of coping appraisal, self-efficacy and perceived benefits positively influence older adults' intention to learn health knowledge on social media. These results indicate that older adults' enhanced self-efficacy helps them realize it is feasible – not impossible – to learn health knowledge on social media, thus improving their intention to engage in such learning tasks. Learning intention is also improved when older adults perceive health knowledge learning to be more beneficial in addressing their health conditions. These patterns reinforce the roles of perceived feasibility and effectiveness of health knowledge learning in facilitating involvement in learning activities.

Third, older adults' emotional state of health anxiety is positively correlated with perceived susceptibility and perceived severity; e-health literacy, taken as older adults' cognitive state, has a positive predictive effect on self-efficacy and perceived benefits. The influence of health anxiety on health knowledge learning intention is also fully mediated by perceived susceptibility. Therefore, perceived susceptibility fully explains the process from older adults' emotional state during knowledge acquisition to the formation of intention to learn such knowledge. We also found that self-efficacy and perceived benefits partially mediate the relationship between e-health literacy and health knowledge learning intention. This empirical evidence implies that self-efficacy and perceived benefits partly illustrate how knowledge internalization develops from older adults' cognitive state.

Theoretical implications

The theoretical implications offered in this paper are noteworthy in three aspects. First, by revealing the mechanism of older adults' intention to learn health knowledge, this study enriches the literature of technology-enhanced knowledge learning among older adults. This study explains the mechanism that older adults' emotional state and cognitive state during knowledge acquisition influence threat appraisal, thereby shaping older adults' intention to learn health knowledge. The present study also fills in the research gap by discussing factors in shaping older adults' intention to learn health knowledge on social media. The identified factors contribute to analysis of the facilitators of older adults' involvement in informal learning activities such as health knowledge learning.

Second, this research enhances knowledge of health behavior in a social media context by applying variables in HBM to the exploration of factors influencing health knowledge learning intention. Unlike previous studies in general online contexts, we examined health knowledge learning behavior in a social media context. Our findings demonstrate that HBM can explain the drivers behind older adults' prevention-oriented health knowledge learning. The current research also expands the application of HBM and deepens understanding of people's learning behavior when exposed to inherently uncertain health knowledge.

Third, from an integrated perspective of emotional and cognitive state, we uncover factors influencing health knowledge appraisal. Our research has innovatively considered the integration of emotional and cognitive components and captured overall and detailed knowledge of the factors influencing health knowledge appraisal. The findings indicate that health anxiety is positively correlated with perceived severity and perceived susceptibility, and e-health literacy is a predictor of self-efficacy and perceived benefits; such results expand the field of health knowledge appraisal using a new perspective and offer a foundation for future research.

Practical implications

The findings of this paper also have practical implications. First, the research findings are expected to bring insights for health knowledge providers on social media regarding how health content can be generated effectively. Notably, perceived susceptibility, self-efficacy and perceived benefits positively predicting older adults' intention to learn health knowledge on social media. Therefore, health knowledge providers should investigate older adults' needs related to health knowledge and develop content appropriate for their health status. A health assessment function targeting older adults can be developed to promote health-related personalized knowledge for older adults based on their assessment results. We therefore encourage health knowledge providers to comprehensively consider older adults' physical and mental abilities, increase the readability of health knowledge, and decrease impractical health solutions to ensure feasible health promotion among older adults. Content should also benefit older adults' health, such as through effectively decreasing health risks and improving health outcomes. In addition, practitioners should reconsider the role of perceived severity and scientifically explain the severity of health issues without overemphasizing disastrous consequences.

Second, the findings of this study could empower older adults to better respond to their health needs by strengthening their learn intention. Although health anxiety has been shown to increase perceived susceptibility to health issues and thus increase older adults' willingness to learn health knowledge, we do not intend to encourage practitioners to take measures to induce health anxiety in older adults. Older adults with severe health anxiety may choose to seek a more in-depth understanding of health issues to relieve tension. As e-health literacy has been confirmed to increase the perceived efficacy and benefits of learning health knowledge, older adults should enhance their skills in this regard. We suggest that older adults be encouraged to engage more with electronic health resources and attend skills training to improve their e-health literacy.

Limitations and future research

This study features limitations that illuminate avenues for future work. First, this study was conducted in China and focused on older adult users of WeChat, Weibo, QQspace, and other Chinese social media platforms; the generalizability of our findings to other social media settings should be verified further. Therefore, cross-cultural research on older adult users of other social media, such as Facebook and Twitter, is needed to examine whether cultural differences shape older adults' intention to learn health knowledge. Second, we collected empirical evidence via self-report measures and did not obtain objective measurements, leading to potential biases. Future research could include other assessment methods to confirm the validity of our findings.

Disclosure statement

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