

Analysis of Factors Influencing Online Health Information-Seeking Behavior based on Structural Equation Modeling

Wenhao Li, Tianyi Zhang

School of Management, Tianjin University of Traditional Chinese Medicine, Tianjin, China

Abstract

Objective To explore the influencing factors of online health information-seeking behavior, elucidate the intrinsic relationship between online health information-seeking behavior and social support, and promote the integration of "ChatGPT + online health" as a significant opportunity to modernize the public health management system. **Methods** Guided by social support theory and utilizing the Stimulus-Organism-Response (SOR) model, this study constructed an online health information-seeking model incorporating five variables: informational support, emotional support, social companionship support, perceived risk, and perceived value. A questionnaire survey was conducted to collect data on the online health information-seeking behaviors of 240 residents, aiming to investigate the influencing factors and their interrelationships. **Results** Perceived value and perceived risk had significant impacts on online health information-seeking behavior, with coefficients of 0.252 ($P < 0.001$) and -0.426 ($P < 0.001$), respectively. Emotional support and social companionship support positively influenced users' perceived value, while informational support, emotional support, and social companionship support negatively influenced users' perceived risk. **Conclusion** Governments and online health community administrators should actively leverage the role of online health communities to encourage user participation in health information-seeking activities.

Keywords

Health information, social support, SOR, ChatGPT.

1. Introduction

General Secretary Xi Jinping proposed in the 20th National Congress of the Communist Party of China to promote the construction of a Healthy China, give top strategic priority to protecting people's health, improve the public health system, and strengthen the construction of the major epidemic prevention and control and treatment system and emergency response capabilities. The COVID-19 pandemic that broke out globally in 2020 has attracted great attention from people all over the world. With the help of media tools such as the Internet, Weibo and WeChat, the public has also become a participant in the management of this crisis event [1]. Since the occurrence of the COVID-19 pandemic, the exchange and transmission of information have played an important role in supporting the fight against COVID-19 and restoring production and life. The emergence and development of online health communities have broken down the barriers of the traditional medical industry, broken through the geographical limitations of medical resources, and connected patients with excellent doctors across the country through the Internet platform [2]. The online medical service platform, by creating an integrated service model, breaks down the information barriers between doctors and patients and enhances the medical continuity between them. In reality, users tend to carry out various types of activities in online health communities based on different purposes and situations [3]. At present, most studies conduct independent analysis and research on online health information seeking behavior. However, there is a strong correlation between personal health status and

information seeking behavior. Users with different health conditions differ in the types and frequencies of health-related information they search for [4]. With the popularization of the Internet, online search has gradually become an important way for residents to obtain health information [5]. With the rapid development of China's economy and the significant improvement of people's living standards, multi-level and diversified health needs have emerged. The online information search method is characterized by low cost, high speed, high quality and being unrestricted by time and space, which can well meet the needs of users. However, there are practical problems such as low quality and insufficient application of information platforms [6]. Based on the SOR theory, this study constructs an online health information search model to explore the correlation between the influencing factors of online health information search behavior. By drawing on the "Internet +" [7] hierarchical diagnosis and treatment model, it is expected that in the future, the new generation of artificial intelligence technology ChatGPT can be used to innovatively solve the obstacles encountered in the search process, so that the "ChatGPT + online health" model can meet people's daily health needs.

2. Subjects and Methods

2.1. Study Subjects

The primary subjects of this survey are social media users aged 18 and above, who possess the ability to comprehend and process written text. The questionnaires were distributed between March and April 2022 using a non-probability sampling method.

2.2. Survey Instrument

Based on a review of relevant domestic and international literature, and building upon the following frameworks: the Online Health Information Seeking and Offline Healthcare-Seeking Behavior Relationship Model proposed by Wang Wentao [8], the Authenticity-Deception Feature List of Health Information compiled by Li Yuelin [9], the Information Acceptance Attitude Framework developed by K.C. Smith et al. [10], the Theoretical Model of User Emotional Interaction Intention Factors constructed by Ji Xuemei [11], the Conceptual Model of User Participation Behavior Influencing Factors established by Pan Taotao [12], the Interpersonal Relationships and Social Commerce Intention Model created by H. Nick Hajli [13], the Influencing Factors Scale for College Students' Online Health Information Seeking Behavior designed by Liu Hongsi [14], the Revised Social Connectedness Scale by Lee R.M. et al. [15], the "Middle-aged Urban Residents Health Information Seeking Behavior and Influencing Factors Questionnaire" developed by Wang Ziyue [16], the Adapted Information System Continuance Model from Bhattacharjee A [17], and the Healthcare Institution Selection Model built by Tang Shaoyu [18], we developed the "Correspondence Relationships Between Latent and Manifest Variables in Online Health Information Seeking Behavior and Related Issues" (Table 1). The survey comprises two main sections: the first collects demographic characteristics, while the second (the questionnaire body) contains 20 observed variables across five dimensions, measured using a Likert 5-point scale. All dimensions demonstrated good internal consistency with Cronbach's alpha coefficients exceeding 0.8. Validity analysis revealed a KMO value of 0.897 with satisfactory Bartlett's test results, indicating excellent reliability and validity of the scale.

2.3. Data Collection Methods

A questionnaire survey method was employed to investigate the influencing factors model of online health information-seeking behavior, aiming to further validate the established relationship model. The questionnaire comprises 24 items, including 20 questions regarding user profiles and health-related issues. Prior to formal distribution, we invited eight senior

professors specializing in management and medical statistics to evaluate the content and structure of the questionnaire through telephone interviews and face-to-face discussions. Based on their professional recommendations, we revised the wording and presentation formats of specific items to ensure validity and feasibility. A total of 303 online questionnaires were distributed, with 241 valid responses retained after excluding those completed in less than 60 seconds. After removing one duplicate submission, 240 valid questionnaires were ultimately obtained, yielding an effective return rate of 79.21%.

2.4. Research Methodology

2.4.1. Structural Equation Modeling

Based on Bambina's categorization of social support in online health communities into three types (informational, emotional, and companionship support) [19], this study constructs an influencing factors model for online health information-seeking behavior using the Stimulus-Organism-Response (SOR) framework. Specifically, social support serves as the stimulus (S) factor, comprising informational support, emotional support, and companionship support. These elements are internalized by individuals as the organism (O) process, ultimately triggering users' participation behaviors as the response (R).

2.4.2. Statistical Analysis

The structural equation modeling based on partial least squares (PLS-SEM) was employed to investigate online health information-seeking behavior. Reliability and validity analyses of the experimental results were conducted using SPSS 22.0 and AMOS 23.0. Upon confirming their psychometric adequacy, confirmatory factor analysis and model validation were subsequently performed.

3. Results

3.1. Online Health Information-Seeking Model

3.1.1. Research Hypotheses

Based on questionnaire data characteristics, research objectives, user profiles, and existing literature, this study examines how informational support, emotional support, and companionship support in online health communities influence health information-seeking behavior through the mediating pathways of perceived value and perceived risk, proposing the following hypotheses:

H1: Informational support in online health communities positively influences users' perceived value

H2: Emotional support in online health communities positively influences users' perceived value

H3: Companionship support in online health communities positively influences users' perceived value

H4: Informational support in online health communities negatively influences perceived risk

H5: Emotional support in online health communities negatively influences perceived risk

H6: Companionship support in online health communities negatively influences perceived risk

H7: Users' perceived value positively influences online health information-seeking behavior

3.1.2. Reliability and Validity Tests

The composite reliability (CR) values of all constructs exceeded 0.8, indicating excellent data reliability and stability. With average variance extracted (AVE) values all surpassing 0.5, the measurement model met fundamental requirements for convergent validity (see Table 1).

Discriminant validity was confirmed as inter-construct correlation coefficients remained below the square roots of their respective AVE values (see Table 1).

Table 1. Reliability and Validity Test Results

Variables	Number of Questionnaire Items	CR	AVE
Informational Support	3	0.878	0.696
Emotional Support	4	0.894	0.679
Companionship Support	3	0.867	0.685
Perceived Risk	4	0.872	0.631
Perceived Value	3	0.876	0.702
Online Health Information-Seeking Behavior	3	0.866	0.683

3.1.3. Model Fit

Using AMOS 23.0 for structural equation modeling, the study demonstrated significant inter-variable relationships. All model fit indices met established criteria, confirming excellent model fit (see Table 2). The model's predictive power was validated with regression R^2 values exceeding the 0.19 benchmark.

Table 2. SEM Fit Index Values

Fit Indices	Recommended Thresholds	Fit Values
λ^2	Lower values indicate better fit	196.738
λ^2 / df	<3.0	1.237
GFI	>0.9	0.926
AGFI	>0.8	0.902
RMSEA	<0.08	0.031
Model SRMR	<0.08	0.0496
Perceived Risk	0.361	Perceived Risk
Perceived Value	0.426	Perceived Value
Online Health Information-Seeking Behavior	0.327	Online Health Information-Seeking Behavior

3.1.4. Model Path Effects

In this study, the maximum likelihood method in AMOS23.0 was used to estimate the path coefficients, and the path coefficients, as well as the T-values and P-values of the paths, were obtained, as shown in Table 3. The hypothesis (H1) that information support has a positive impact on perceived value does not hold, while the other hypotheses are valid. That is to say, the information needs of users do not affect their perceived value. This indicates that the information support provided to users in the community does not have an effect on their perceived value. This is because users have a stronger sense of purpose when searching for health content in online health communities. They rely more on whether they truly need this kind of information content or the importance of the information value. It shows that when users conduct online health information searches, the emotional belonging in the online health community and the support from the community are more important than the large amount of information content they search for.

Table 3. Path Coefficients and Significance Test Results

Path	Path Coefficients	T-values	P-values	Conclusion
Informational Support → Perceived Value (H1)	0.146	1.894	0.058	Not Supported
Emotional Support → Perceived Value (H2)	0.291	3.944	***	Supported
Companionship Support → Perceived Value (H3)	0.308	3.883	***	Supported
Informational Support → Perceived Risk (H4)	-0.307	-4.060	***	Supported
Emotional Support → Perceived Risk (H5)	-0.358	-4.972	***	Supported
Companionship Support → Perceived Risk (H6)	-0.153	-2.066	*	Supported
Perceived Value → Information-Seeking Behavior (H7)	0.252	3.523	***	Supported
Perceived Risk → Information-Seeking Behavior (H8)	-0.426	-5.654	***	Supported

Note: ***Significant at the 0.001 level *Significant at the 0.05 level

4. Discussion

Analysis of experimental results demonstrates the rationality of the constructed online health information-seeking model. The influence coefficients of key factors on information-seeking behavior, ranked in descending order, are: Perceived risk ($\beta = -0.426$), Perceived value ($\beta = 0.252$). Regarding antecedents of perceived risk: Emotional support ($\beta = -0.358$), Informational support ($\beta = -0.307$), Companionship support ($\beta = -0.153$). For predictors of perceived value: Companionship support ($\beta = 0.308$), Emotional support ($\beta = 0.291$), Informational support ($\beta = 0.146$). These findings prompt the following analytical discussion.

4.1. Emotional and Companionship Support Significantly Enhance Perceived Value

First, many patients with chronic psychological conditions perceive online health communities as effective platforms for alleviating mental stress, where social influence factors positively shape behavioral intentions. Zhou et al.'s research on health community support theory demonstrates that both informational and emotional support from community members strengthen users' health information-seeking intentions. By expressing empathy and disseminating positive energy within these communities, users foster engagement and motivate disease prevention behaviors among participants.

4.2. Social Support Significantly Reduces Perceived Risk

Information overload during online searches often leads to difficulties in content filtering, authenticity verification, and clarity comprehension, which may exacerbate health-related anxiety. However, the emotional support provided in online health communities enhances users' confidence in disease management, thereby mitigating perceived risk. Choi's predictive framework for social support needs in online health networks reveals that personalized support interventions increase user participation while effectively lowering risk perception.

4.3. Social Support Mediates Information-Seeking Behavior via Perceived Value and Risk

Informational, emotional, and companionship support collectively improve users' emotional states, manifested through: 1) Positive attitudes toward future information-seeking. 2) Increased health information acceptance. 3) Willingness to share knowledge. Such emotional reinforcement cultivates exploratory tendencies and approach behaviors, sustaining active community participation. Reduced risk perception coupled with enhanced optimism creates a

self-reinforcing cycle that promotes continuous engagement in online health information-seeking activities.

References

- [1] Zhang Yu, Wang Chenyang, Wang Lu. Research on public risk information search and processing behavior under the epidemic of novel coronavirus pneumonia[J]. *Medicine and Society*, 2020, 33(12):64-69.
- [2] Zhang Xin. Research on the types and preferences of user participation behaviors in online health communities[J]. *Intelligence and Data Work*, 2019, 40(5):84-91.
- [3] Xiang Chenkai, Zhang Yan, Yang Qian. Discussion on the mechanism of improving the utilization of residents' health services on online medical service platforms[J]. *Chinese Journal of Health Information Management*, 2020, 17(04):513-517.
- [4] Li Jianhong, Dong Wei, Li Wenlan, Xiao Mengmeng. Meta-analysis of influencing factors of online health information seeking behavior[J]. *Information Engineering*, 2020, 6(02):78-90.
- [5] Xiong Xinyu, Zhang Liang. Differences and influencing factors of online health information seeking behaviors between floating population and registered population in Shenzhen[J]. *Medicine and Society*, 2021, 34(05):5-9.
- [6] Lü Yixing, Zhang Jingbo, Chen Nini, et al. *China Health Quality Management*, 2022, 29(02):1-3.
- [7] Xu Xiangdong, Zhou Guanghua, Zhang Yuxi, et al. *Chinese Journal of Health Information Management*, 2020, 17(04):503-507.
- [8] [Wang Wentao, Zhang Xingping, Luo Qinfeng, Zhang Zhen, Zhang Chen. Quantitative empirical evidence on the association between online health information search and offline medical treatment behavior of digital natives[J]. *Information Theory & Practice*, 2021, 330(07):86-93.
- [9] Li Yuelin, Zhang Xiu, Wang Shanshan. Research on the quality of social media health information: An analysis of the characteristics of authentic and false health information[J]. *Journal of Information Technology*, 2018, 37(03):294-304.
- [10] SMITH K C, KROMM E E, KLASSEN A C. Print news coverage of cancer: What prevention messages are conveyed when screening is newsworthy? [J]. *Cancer Epidemiology*, 2010, 34(4) :434-441.
- [11] Ji Xuemei, Li Changrong. Research on the influencing factors of users' emotional interaction willingness in online health community from the perspective of information ecology[J]. *Modern Information*, 2022, 42(01):97-107.
- [12] Pan Taotao, Lv Yingjie. Research on the influencing factors of user participation behavior based on SOR model in online health community[J]. *Intelligence and Data Work*, 2022, 43(02):76-83.
- [13] HA]LI H. N. The role of social support on relationship quality and social commerce[J]. *Technological Forecasting & Social Change*, 2014, 87:17-27.
- [14] Liu Hongsi, Liu Yuru, Shen Lining. Influencing factors of college students' online health information seeking behavior during the novel coronavirus pneumonia epidemic[J]. *Chinese Journal of Medical Library and Information Technology*, 2021, 30(02):65-74.
- [15] Lee R M, Draper M, Lee S. Social connectedness, Dysfunctional Interpersonal Behaviors, and Psychological Distress: Testing a Mediator Model. [J]. *Journal of Counseling Psychology*, 2001, 48(3) :310-318.
- [16] Wang Ziyue. Research on online health information seeking behavior and influencing factors of middle-aged urban residents[D]. *Zhejiang University*, 2019.
- [17] BHATTACHERJEE A. Understanding Information Systems Continuance: An Expectation-Confirmation Model[J]. *MIS Quarterly*, 2001, 25(3):351-370.
- [18] Tang Shaoyu. Research on the influencing factors of urban residents' medical behavior[D]. *Southwestern University of Finance and Economics*, 2014.
- [19] Bambina A. Online Social Support: The Interplay of Social Networks and Computer-mediated Communication[M]. *Cambria Press*, 2007.