Creative Education, 2023, 14, 844-852
https://www.scirp.org/journal/ce
ISSN Online: 2151-4771
ISSN Print: 2151-4755

Study on the Mechanism of Influencing Patients' Willingness to Use Online Consultation Based on SOR Theory

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How to cite this paper: Xiao, F., Zhu, Y., & Wei, X. H. (2023). Study on the Mechanism of Influencing Patients' Willingness to Use Online Consultation Based on SOR Theory. *Creative Education, 14,* 844-852.
https://doi.org/10.4236/ce.2023.144055

Received: March 2, 2023
Accepted: April 25, 2023
Published: April 28, 2023

Abstract

In recent years, with the birth and development of 5G technology, people have paid more and more attention to online consultation. From the perspective of patients, this paper explores the platform's disclosure integrity, service timeliness, privacy security, and doctor's qualification reliability, feedback effectiveness, and communication ability based on the SOR theory. Based on the results, suggestions were made to optimize online consultation services, increase the popularity of online consultation, and optimize social resources. The study found that disclosure integrity has a positive impact on users' financial risks, while privacy security and feedback effectiveness have a negative impact on users' financial risks. Disclosure integrity and service timeliness have a negative impact on users' time risk; Privacy security has a positive impact on users' time risk. Users' financial risk and time risk have a significant negative impact on users' willingness to continue using.

Keywords

Online Consultation, Willingness to Use, SOR Theory

1. Introduction

Online consultation as a new and still immature way of accessing health care breaks with the traditional view of the public and has significant implications for people's lives. In addition to reducing the risk of transmission from direct contact with people in the event of an epidemic, it also compresses the time and space costs of accessing health care in people's daily lives. However, online consultation as an emerging medical model is not yet perfect, and patients as the main users

are skeptical about its safety and effectiveness. Therefore, this study will propose recommendations to optimize the service of online consultation from the patient's perspective and thus promote the flourishing of online consultation.

2. Status of Research

In recent years, there has been an increasing amount of research on online consultation in Internet healthcare at home and abroad. Li Quancai believed that online consultation had the advantages of convenience, diversity and openness, which can make the process and mechanism of medical consultation more convenient and efficient, and further enhance the satisfaction of medical services (Li, 2015). The increasing development of Internet technology in recent years has also further enhanced the online consultation model, with HeXuesong pointing out that the application of Internet healthcare in China has become more and more extensive, involving various aspects of the whole service chain, such as health management, disease prevention, consultation arrangement, disease treatment, cost settlement and post-rehabilitation (He & Luo, 2018). Yu Guangjun stated that the online consultation platform has become a new platform for young doctors to bring their strengths into play (Yu, 2020).

In summary, online consultation is a new era medical model with great research value, but due to its short development time, most of the relevant studies are based on the technical construction and improvement within the online consultation itself, to some extent ignoring the complementary relationship between patients and hospitals. It is important to understand the needs of the patient population in order to effectively and efficiently promote the development of online consultation models. Therefore, this study aims to make recommendations to optimise the online consultation service from the patient's perspective, thereby increasing the popularity of online consultation.

3. Theoretical Foundations and Research Hypotheses

3.1. Theoretical Foundations

SOR theory is a model for studying people's psychological and behavioural connections, and is mainly used to explain the influence of environmental features on users' mental activities and actions. From the perspective of SOR, Li Kuan explained users' health information selection hospital from 3 dimensions of stimulus-organism-response (Li, 2020). Based on the SOR framework, He Zhijia combined with attachment theory to establish a research model of users' continuous use behaviour in online medical communities, and explored how stimulus factors affect users' emotions and perceptions (He, 2019). In summary, this paper will analyse the factors that may stimulate consumers' willingness to use from both platform and doctor perspectives based on the SOR theory, and use patients' financial risk or time risk as the organism and patients' willingness to use as the response.

3.2. Research Hypothesis

1) The role of platform influence

Disclosure completeness refers to patients' perceptions of the diversity of types and breadth of coverage of health information published on online consultation platforms. Due to the unique nature of online consultations, patients demand more information on the source, accuracy and timing of updates. Accordingly, the following research hypothesis is proposed.

H1: Disclosure completeness can negatively affect patients' financial risk.

H2: Disclosure completeness can negatively affect patients' time risk.

2) The quality of website services is based on the provision of user-friendly and easy-to-use information services to users. China's online health platforms are characterized by broad coverage and comprehensive services, which often provide users with one-stop services ranging from disease and drug information consultation to online consultation and additional registration, but on the other hand, they also increase the complexity of the platform and make it more difficult for users to access the services (Qian, Xu, & Wang, 2019). Accordingly, the following research hypothesis was formulated.

H3: Timeliness of service can negatively affect patients' time risk.

3) Patients face the risk of having their identity information, laboratory results and test results leaked when they consult medical information services through online consultation platforms, and such private information can place an additional burden on patients' consultations once they are used by third-party platforms. Accordingly, the following research hypothesis is proposed.

H4: Privacy and security can negatively affect patients' financial risk.

H5: Privacy and security can negatively affect patients' time risk.

4) The role of physician influence

The reliability of a doctor's qualification as perceived by patients in the context of online consultation can be judged visually by patients' objective indicators such as the popularity, title and number of patients served by the doctor on the online consultation platform (Wang, 2020). Yajie Yu constructed a SEM equation to explain that the doctor's title has a significant positive influence on the final choice of doctor (Yu, 2020). Accordingly, the following research hypothesis was proposed.

H6: Credential reliability can negatively affect patients' financial risk.

H7: Credential reliability can negatively affect patients' time risk.

Feedback validity refers to whether the doctor's diagnostic findings and recommendations are effective in relieving the patient's condition. The more effective the doctor's feedback is, the less the risk that the patient will spend time and money on the next diagnosis due to misdiagnosis. Accordingly, the following research hypothesis was formulated.

H8: Feedback effectiveness can negatively affect the patient's financial risk.

H9: Feedback effectiveness negatively affects the patient's time risk.

A doctor's communication skills refer to the doctor's ability to communicate with patients non-face-to-face through text, voice and video. The doctor's ability

to communicate can directly affect the patient's understanding of the condition, and as doctor-patient communication online requires payment, the doctor's ability to communicate has a higher impact on the financial and time risk perceived by the patient during the online consultation than offline. Accordingly, the following research hypothesis is proposed.

H10: Communication competence can negatively influence patients' financial risk.

H11: Communication competence can negatively affect patients' time risk.

5) The role of perceived risk in influencing

The theory of perceived risk was first proposed by Bauer in 1960, who argued that consumers take a certain amount of risk when making a purchase because they cannot accurately predict the consequences of that purchase, which may have a negative impact on them (Yao & Deng, 2017). In this paper, two dimensions are analysed: financial risk refers to the risk of mismatch between the cost of the consultation and the cost of the medicine and the outcome of the visit when the patient asks for the consultation online. Time risk refers to the time risk caused by patients' lack of proficiency and doctor matching seeking when using online consultation. The higher the financial risk and time risk, the lower the willingness to use the platform. Accordingly, the following research hypothesis is proposed.

H12: Financial risk can negatively affect patients' willingness to use.

H13: Time risk can negatively influence patients' willingness to use.

4. Research Design

4.1. Survey Design

We collected data by distributing questionnaires. The questionnaire design was divided into three main parts: firstly, a description of the main purpose of the questionnaire; secondly, a survey of the basic information of the patients of the online consultation; lastly, a measure of the latent variables of the online consultation. The latent variables were measured by the five-point Likertscale (**Table 1**).

4.2. Data Collection

A total of 238 questionnaires were collected through this study. To ensure the authenticity and reliability of the data, the results of questionnaires with a response time greater than three minutes were screened out. 200 valid questionnaires were returned, 169 of which were the results of questionnaires that had used the service of web-based consultation.

5. Data Analysis and Results

5.1. Measurement Validation

In this paper, the validation factor analysis was used to test the questionnaire. The overall reliability of the questionnaire was Cronbach's alpha coefficient = 0.786, indicating good reliability; KMO = 0.737, Bart's spherical value =

2566.104, indicating that factor analysis could be conducted. As can be seen from Table 1, all latent variables with AVE greater than 0.5 and CR greater than 0.7 indicate that the model has high convergent validity; all latent variables have standardized loading coefficients above 0.7, indicating that the model has good reliability. The AVE values of the latent variables were greater than 0.5 and greater than the correlations among the latent variables, indicating that the model had good convergent validity and good discriminant validity among the latent variables (Table 2).

Table 1. Measurement items.

Factors	Labels	Items
Completeness of information disclosure on the online consultation platform	Full disclosure of doctor information	A1
	I can ask for all the diseases I want to consult	A2
	I can buy all the medicines I want on the platform	A3
Timeliness of service delivery on the online consultation platform	I can quickly find the information I want to find on the platform	B1
	The platform can quickly assign a doctor to me based on my condition	B2
	The platform can handle my aftercare issues efficiently and quickly	B3
Reliability of doctors' qualifications	I am reassured by the good reviews of the doctors	C1
	The authority of the doctor's affiliation reassures me	C2
	The doctor's expertise in the type of disease I need	C3
Effectiveness of doctors' feedback	The doctor may provide appropriate health advice quickly and effectively	D1
	The doctor was very responsible in providing treatment	D2
	The doctor is very skilled in the online consultation process	D3
	The doctor is very knowledgeable in providing disease informatio	D4
	The doctor was able to help me find relief from my illness	D5
Ability of doctors to communicate	The doctor was able to answer my questions in a timely manner	E1
	Good communication between me and the doctor	E2
	The doctor was honest and patient in answering the questions I asked	E3
Security of privacy	The platform may reveal my personal information	F1
	The platform may track my mobile phone usage habits	F2
	The platform may track my mobile phone information and charge me for the consultation based on the amount I have spent historically	F3
Financial risk to patients	I am concerned that the online consultation will not be reimbursed by my health insurance	G1
	I am concerned that the online consultation is not priced correctly and that I will be charged for the service	G2
	I am concerned that the online consultation service is provided without informing me of the charges for the service and that the charges are mandatory	G3
Time risk for patients	I am concerned that the time spent on the online consultation is ineffective	H1
	I am concerned about the length of time it takes to find the information I need	H2
	I am concerned that medicines purchased on the platform will take longer to be delivered	H3

Table 2. Contruct reliability and convergent validity.

Latents	Items	Standard load factors	AVE	CR
Completeness of disclosure	A1	0.870	0.734	0.891
	A2	0.897		
	A3	0.789		
Timeliness of service delivery	B1	0.799	0.658	0.852
	B2	0.846		
	B3	0.789		
Reliability of doctors' qualifications	C2	0.883	0.785	0.916
	C3	0.914		
	C4	0.855		
Validity of doctor feedback	D1	0.851	0.707	0.923
	D2	0.909		
	D3	0.739		
	D4	0.819		
	D5	0.858		
Ability of doctors to communicate	E2	0.863	0.733	0.892
	E3	0.860		
	E4	0.844		
Security of privacy	F1	0.813	0.569	0.794
	F4	0.882		
	F5	0.560		
Patient financial risk	G1	0.818	0.639	0.841
	G4	0.863		
	G7	0.714		
Patient time risk completeness of disclosure	H1	0.945	0.667	0.855
	H2	0.655		
	H4	0.828		

5.2. Path Analysis and Results of Hypothesis Testing

In this paper, structural equations were constructed through SPSS. As the sample size was less than 200, the results of SEM analysis of the structural equation model were not effective, so path analysis was used to test the impact of disclosure completeness, timeliness of service delivery, reliability of physician qualifications, effectiveness of physician feedback, physician communication skills, and privacy and security on patient time risk and patient financial risk respectively (Table 3).

Table 3. Hypothesis testing results.

Hypothesis	X	→	Y	Standardized path coefficient	SE	Z	*p*-value	Results
H1	Completeness of disclosure	→	Financial risk	−0.139	0.063	−1.796	0.072	Not supported*
H2	Completeness of disclosure	→	Time risk	0.107	0.076	1.409	0.159	Not supported
H3	Timeliness of service	→	Time risk	−0.173	0.079	−2.307	0.021	Supported**
H4	Privacy and security	→	Financial risk	0.172	0.077	2.284	0.022	Supported**
H5	Privacy and security	→	Time risk	0.168	0.085	2.240	0.025	Supported**
H6	Reliability of qualifications	→	Financial risk	−0.097	0.064	−1.293	0.196	Not supported
H7	Reliability of qualifications	→	Time risk	−0.057	0.070	−0.758	0.448	Not supported
H8	Feedback validity	→	Financial risk	0.133	0.076	1.731	0.083	Supported*
H9	Feedback validity	→	Time risk	0.086	0.083	1.135	0.257	Not supported
H10	Communication skills	→	Financial risk	−0.042	0.072	−0.556	0.578	Not supported
H11	Communication skills	→	Time risk	−0.088	0.080	−1.177	0.239	Not supported
H12	Financial risk	→	Willingness to continue using	−0.151	0.005	−1.990	0.047	Supported**
H13	Time risk	→	Willingness to continue using	−0.173	0.005	−1.990	0.047	Supported**

(Notes: **indicates $p < 0.05$; *indicates $p < 0.1$).

6. Conclusion

Platform disclosure completeness significantly and negatively affects patients' financial risk, but has no significant effect on patients' time risk. Timeliness of service significantly and negatively affects patients' time risk because the time risk is reduced when patients can get the appropriate response quickly and save time. Privacy and security significantly and positively affects patients' financial risk and time risk. In order to ensure the security of the patient's privacy, the platform usually requires the patient to fill in various information such as identity information, telephone number for verification, which is linked to the patient's savings card, thus increasing the patient's financial risk and taking a lot of time, the privacy is not guaranteed to be completely undisclosed and the perceived time risk on the part of the patient increases.

The reliability of the doctor's qualifications has no significant impact on financial risk and time risk. This is due to the limited consultation options available to patients, which makes it difficult for patients to deepen their understanding of the doctor from the conversation, and only stay in the doctor's introduction on the homepage, few patients have a deeper understanding of the doctor's qualifications. The time risk is not significantly affected by the reliability of the doctor's qualifications; patients do not seek help from famous doctors for minor illnesses, and therefore do not lose much property.

The validity of physician feedback significantly and positively influenced patients' financial risk, with no significant effect on time risk. Possible reasons for this are that in online consultations, the doctor's feedback on the condition is valid, but some of the feedback does not resolve the condition and requires offline treatment through medical devices, and the hospital will require medical tests before treatment, and the patient pays double for treatment, and may make a mistake in the purchase of medicines, both of which increase the financial risk for the patient. Secondly, as the majority of patients using web-based consultations are chronically ill and have non-critical major medical conditions, and the length of time for web-based consultations generally does not exceed 24 hours, patients are able to change doctors or platforms in a timely manner, or seek treatment directly offline, even if the effectiveness of the doctor's feedback in web-based consultations is not high, resulting in a non-significant risk to patients for the time perceived by them.

There is no significant impact of the doctor's communication skills on both financial and time risks to the patient. This is because in an online consultation, the doctor asks for all the information missing from the patient's medical history at the beginning of the communication in order to get a more accurate picture of the patient's condition.

7. Recommendations

The popularity of online consultation needs to be improved. The online consultation platform can cooperate with physical hospitals, carry out online and offline popularization of various aspects of science, and increase its own diagnosis and treatment capabilities, so as to gradually change people's fixed traditional concept of medical treatment and enhance the existence and credibility of the online consultation.

The online consultation platform should be more intelligent, secure and humanized. In terms of service content, the platform should fully disclose the disease, doctor and other information needed by the patient, and protect the patient's privacy and security, balancing the perceived time and financial risks of using the online consultation service.

The features offered by web-based clinics should be what users really need. For example, a comparison of the existing features of the platform with users' wishes reveals that patients urgently need a service to introduce and compare the functions of medicines; for people from poor families or with special illnesses, a section can be created for special services.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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