

Impact of Doctor-Patient Trust on Users' Decision-Making in Online Healthcare Community

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Abstract

In order to understand the impact of users' online medical behavior factors and decision-making information demand in online healthcare community, this paper based on the theory of trust, trust model and trust based on network transmission mechanism built a users' online healthcare clinic decision-making model in online healthcare community, and collected the actual data, used the theory of regression analysis method to verify the model. The model had a good fitting effect on predicting the actual purchase behavior of users. The results showed that doctors in online health community should provide as much personal trust as possible, such as doctor titles, hospital grades and other subject evaluations, to increase the trust of potential users of online health community and promote their decision-making.

Keywords

Online healthcare community, Trust transfer, Medical decision-making, Online consulting.

1. Introduction

The rapid development of information technology and the huge demand for medical services promote the development of online healthcare. Many internet-based platforms, such as online healthcare community (OHC) and forums are set up to provide online healthcare consultation services, from which users can obtain disease diagnosis information and disease management advice. As a supplement to the offline medical and health platform, the generation and development of online healthcare community provides a new way to solve the current problems such as the shortage and uneven distribution of medical resources and the tension between doctors and patients[1]. Since the online healthcare community has abundant doctor information and perfect feedback mechanism, users can make decisions based on OHC's service quality, attitude, doctors' attributes and other information when choosing the provider of healthcare consultation service. Compared with general commodities and services in the e-commerce environment, healthcare consulting services are closely related to users' healthcare management and have higher requirements on the professionalism of the "seller". Therefore, users pay extra attention to doctors' information when making decisions[2].

Users can either seek healthcare services directly within the healthcare community or choose 'online appointment, offline treatment' in online health community. The difference in the choice of these two channels indicates that users have a certain preference when choosing the healthcare service platform, that is the information in online healthcare community can have an impact on the medical treatment decision of users. Although the research on consumer decision-making at home and abroad has become mature, the research on users' medical decision-making in online healthcare communities is still in its infancy. At present, only scholars have studied the behavioral intention of users in online healthcare communities from the perspectives of hospitals, doctors and website credibility[3], but few studies have

considered the influencing factors of users' choice of different channels. Based on the theory of trust, this paper constructs a model of the influence of in online healthcare communities information on users' medical decision-making, and verifies the model effect through empirical analysis, so as to understand the information needs in online healthcare communities users' medical decision-making, provide decision-making basis and reference for online healthcare communities and doctors, and promote the development of online health communities.

2. Theoretical Basis

2.1. Online Health Community Service Quality Information

The emergence of online healthcare communities gives users a variety of channels (online communities and offline hospital access) to choose[4]. In a specific hospital, users can only obtain information about the status of the hospital and the title of the doctor, or obtain information about the professional ability of the doctor from friends. Although these two kinds of information are useful to users, there is still a lack of information to reveal the quality of doctors' services effectively. In online healthcare communities, users can get more information about the quality of doctors' services than in traditional hospitals. The online health community providing user-generated and system-generated information, representing a new way of disclosing the quality of doctors' services. User-generated information is information generated by users with online consulting experience, such as feedback, comments, and ratings. The system-generated information refers to the information generated by the website where the doctor works and displays the behavior of the service provider, such as contribution, grade, popularity. For users, clues about the results of doctor services can be found not only from user-generated information, but also from system-generated information about the quality of doctor services[5].

Due to the limited ability of users to obtain information, many users have no methods or channels to identify the professional ability of doctors, so there is a significant information asymmetry between users and doctors. In addition, since doctors' services are intangible, indivisible and heterogeneous, it is difficult for users to judge the quality of doctors' services, and doctors cannot show their professional skills to users due to the lack of interaction online. Therefore, doctors' information in online healthcare communities is very important for users' choice of treatment platforms.

2.2. Trust Theory

Trust has become an important factor in consumers' decision-making in the internet environment. Oliveira believes that in the e-commerce environment, consumers' trust in suppliers will affect their online purchase intention and behavior[6]. Yang Xuan making an integration of the traditional consumer behavior model TAM/TPB research measurement model, found that consumer confidence is the first key factor of affecting the behavior choice[7]. Nuttavuthisit studied the factors influencing consumers' decision to buy new green products and found that the lack of (especially) systematic trust lowered consumers' expectation of the benefits of buying organic food and made them less likely to buy organic food[8]. Wang, wei-tsong found that consumers' trust in the initiators of group-buying activities and group-buying websites can motivate consumers to participate in online group-buying activities[9]. Therefore, for online providers, providing consumers with trust guarantees can enhance consumers' trust, and in online healthcare communities, providing users with enough reference information can increase users' trust in the community, thus influencing users' decision on medical treatment.

Trust is a psychological state of having an expectation that the other party will not hurt you. It has two meanings: first, expecting the exchange party to be honest, responsible and not hurt yourself; second, accepting your weaknesses and try to rely on the other party [8]. Cognition and emotion are the two important foundations of trust. Cognition comes from the trusted person's technology, ability, knowledge and other aspects, that is, the belief that the trusted person is capable of fulfilling the requirements of the trusting person. The starting point of emotional trust is the emotional connection between both parties. If both parties have a close emotional relationship, then both parties will expect that the other party has no motivation and willingness to damage their own interests[10, 11]. McKnight and Chervany propose an interdisciplinary typology of trust that includes four concepts: trust propensity, institutional trust, trust belief, and trust intention, with an emphasis on the distinction between trust belief and trust intention. Trust belief refers to the consumer's belief that the website service provider has at least one characteristic that is beneficial to him (the consumer). Trust intention means that consumers are willing or inclined to rely on website service providers even though they cannot control them [9, 12].

According to trust transfer theory, trust transfer involves three subjects, that is, the trustworthy party, the trusted party and the third party (the subject who has obtained the trust of the trustworthy party). The transfer logic is as follows: when the credit granting party trusts a third party and the third party has a close relationship with the trusted party, the credit granting party will trust the trusted party because of its trust in the third party, that is, the trust of the credit granting party to the third party will positively affect its trust in the trusted party and the transfer of trust will be realized. Accordingly, the third party is the source party of the trust transfer, and the trusted party is the target party of the trust transfer[13].

3. Model and Hypothesis

3.1. Research Model

Although there are many factors can influence users' behavior trust intention and trust, but users to select the online healthcare communities channel cannot interact with the doctor before, only on the basis of online healthcare communities provide doctor's specific social background (such as title, hospital grade) and the information provided by others (e.g., comments, recommended) after build trust in doctors to make medical decisions. Among them, the characteristics of service subjects and environmental background information can directly affect users' perceived trust in doctors' abilities, while other subjects' behaviors affect users' trust through trust transmission. All these factors will jointly affect users' medical decision-making. Based on the above discussion, this paper proposes a conceptual model of user decision making in online healthcare community based on service subject characteristics and trust transfer theory, as shown in figure 1. Since the online time of doctors and the department of doctors can influence users' decisions, the online time of doctors and the department of doctors are taken as control variables.

3.2. Service Subject Characteristics and Context Information

Initial trust is the first stage in the dynamic process of trust development, which refers to a psychological state in which the trustworthy party is willing to trust the other party to a certain extent during the initial interaction[14]. During the establishment of service relationship, the improvement of customer's belief mainly comes from the estimation of the behavior of service providers [15]. In the field of e-commerce, many studies have shown that customers' trust in merchants will affect their trust in products and thus affect customers' willingness to pay. In B2C e-commerce transactions, the reputation of online stores

significantly affects consumers' trust [16]. During the financing process of crowdfunding projects, investors' trust in the sponsors of projects will increase their willingness to invest, thus increasing the possibility of successful project financing[17]. In the online healthcare community, although users cannot interact with doctors before determining the treatment channel, they can observe the information of doctors to increase their trust in doctors.

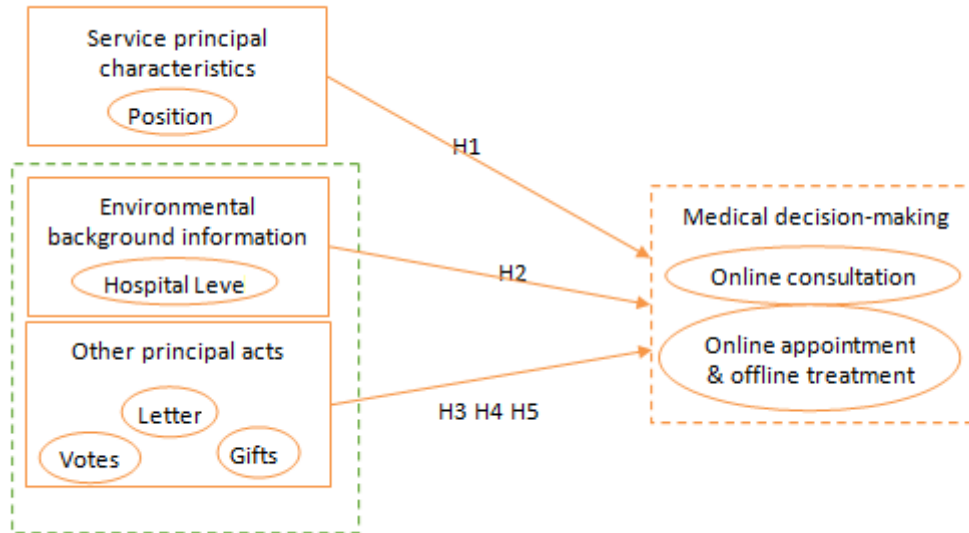


Fig. 1 Research model

In a relatively stable social environment, consumers tend to have a high degree of trust in the legal system and the government system. In China's medical system, there is a unified evaluation system for the titles of doctors, especially doctors [18]. In the context of the traditional medical environment, users usually believe that the title of doctors is an important reflection of their skill level, so they trust and favor doctors with higher title levels [2]. Therefore, the title can have an impact on the perceived credibility of doctors' ability, so we believe:

H1a: doctor's title has a significant positive impact on users' online decision making.

H1b: doctor's title has a significant positive influence on users' online appointment and offline treatment decision.

When judging the competence of doctors, users not only refer to the title of doctors, but also evaluate the rank of hospitals in which doctors work. In the traditional medical environment, users are more inclined to go to a better hospital for medical treatment [19], so the medical grade of the hospital where the doctor works can be used as relevant social background information to influence the trust intention and trust behavior of users. Therefore, the following hypotheses are proposed in this paper:

H2a: the grade of the doctor's hospital has a significant positive impact on the online treatment behavior of users.

H2b: the grade of the hospital where the doctor is located has a significant positive influence on the online and offline medical treatment behavior of users.

3.3. The Influence of Other Subject Actions

Many studies show that online reviews have become an increasingly popular way to learn about product performance and quality. According to market Research firm Jupiter Research, more than 75% of consumers consult online reviews before buying a product[20]. Cousineau emphasizes that according to the herd rule, when people evaluate an object without prior

knowledge or experience, they are more likely to align their own views with those of their group members[21]. In online healthcare community, users' feedback to doctors mainly includes the following two categories: evaluation and gratitude[2].

Users' evaluation behavior. People with similar experiences can provide consumers with more and more authentic product information, reduce the purchase risk and help them make purchase decisions. The number of user votes in online healthcare community reflects the degree of acceptance of the treatment level and service attitude of the treated users towards their attending doctors, and can also help potential users build trust in doctors. Therefore, we propose:

H3a: the number of votes has a significant positive impact on users' online medical treatment decisions.

H3b: the number of votes has a significant positive impact on users' online appointment and offline medical treatment decision.

Users' gratitude. In online healthcare community, users' recognition of the doctor's expertise is also reflected in the number of thank-you notes and gifts. The thank-you letter describes that the interaction between the user and the doctor during the treatment can increase the potential user's understanding of the doctor, thus enhancing the potential user's trust in the doctor. The number of gifts not only expresses the user's gratitude and praise to the doctor, but also represents the user's additional financial return to the doctor, which is the recognition of the doctor's treatment level and service attitude, and can also increase the user's trust in the doctor. Therefore, we believe that:

H4a: the number of thank-you letters has a significant positive impact on users' online decision making.

H4b: the number of thank-you letters has a significant positive impact on users' online appointment and offline medical treatment decision.

H5a: the number of gifts has a significant positive impact on users' online medical treatment decisions.

H5b: the number of gifts has a significant positive influence on users' online appointment and offline medical treatment decision.

4. Study

4.1. Research Data

In order to verify the model effect and understand the influencing factors of users' online and offline medical treatment behavior, this paper collected real data from Hubei and Shaanxi provinces on haodafu, the most representative website of online healthcare community in China for empirical analysis. The reason for choosing this region is that the two provinces are located in the central part of China and their economic level is in the middle. Therefore, the information of all doctors in the two provinces was obtained, and a total of 5,395 doctors were obtained, among which 659 doctors were able to open the functions of online consultation and online appointment. After stripping out the missing records, the final study sample was 542 doctors. The research variables of this study are shown in table 1.

4.2. Result

4.2.1. Descriptive Analysis

The title is a qualitative variable so it needs to be quantified. In terms of quantitative treatment of professional titles, this paper uses 0~3 to represent resident physicians, attending physicians, deputy chief physicians and chief physicians respectively. The descriptive statistical results of each variable are shown in table 2. Thank-you notes, votes

and thoughtful gifts are users' feedback on the quality of medical care, which varies widely and varies significantly from doctor to doctor. The number of doctors' online consultation orders and appointments indicates that there are significant differences in the number of doctors' online and offline services. The average position of doctors is 2.42, and the high average value reflects that the title level of online doctors of good doctors is relatively high, doctors have rich experience in medicine, medical service quality is guaranteed, and users can receive better services.

4.2.2. Correlation Analysis

The correlation coefficient matrix, table 3, shows that the correlation coefficient between the number of votes and the number of online consultations is 0.8, the correlation coefficient between the number of gifts and the number of online consultations is 0.794, and the correlation coefficients between the number of votes and the number of thank-you letters and gifts are 0.818 and 0.845, respectively. The correlation coefficients of other variables are all lower than 0.64, so there is no multicollinearity problem.

Table 1. Variable declaration

Variables	Description	Type
Longevity	The extent of a doctor’s experience in using OHC measured by the number of days since the doctor first joined the OHC.	Interval
Departments	Department to which a doctor belongs.	Dummy
Position	certified by the educational system. In general, four stages exist for titles (coding in order): Professor (3), Associate Professor (2), Lecturer (1), Assistant (0).	Ordinal
Level	Official certification of hospitals.	Ordinal
Votes	Number of votes showing praise given by patients to doctors.	Interval
Letters	Number of thank-you letters written by patients to doctors.	Interval
Gifts	Number of virtual gifts sent to doctors.	Interval
Online consultations	Number of patients who came online to interact with doctors.	Interval
Appointment	Number of appointments for this doctor's clinic via the website.	Interval

Table 2. Descriptive statistics

	Min	Max	Mean	Std.
Departments	0	71	43.78	17.044
Online consultations	2	26931	1908.13	2912.602
Votes	0	1220	130.62	179.391
Letter	0	395	65.25	101.376
Gifts	0	2456	125.02	245.279
Longevity	139	4306	2867.58	1017.903
Appointment	0	5934	270.78	435.767
Position	0	3	2.42	.678
Level	2	3	2.95	0.25

4.2.3. Regression Analysis

Table 4 and table 5 describe the results of the regression analysis with online consultations and appointments as the dependent variables, respectively. All variables VIF < 10 in table 4 and table 5 indicate that there is no multicollinearity problem. The significance of independent and dependent variables in table 4 and table 5 shows that hypothesis H1, H2, H3, H4 and H5 are valid.

First, polls (beta =8.989, P<0.01) and gifts (beta =4.634, P<0.01) can positively promote online consultation among users of online healthcare communities, indicating that H3a and H5a are verified. The positive effect of the poll (beta =1.159, P<0.01) on online healthcare community users' online appointment and offline medical treatment was significant, indicating that H3b was verified. Patients voted on their satisfaction with the quality of their doctors' services. The more votes, the more likely the user is to choose a doctor. The gift represents the patient's recognition of the doctor, and the more the gift, the higher the recognition. When the degree of understanding and recognition is high, patients' trust in doctors increases, and both sides actively cooperate to obtain the expected results, which proves that trust has a positive impact on online health community's medical treatment behavior.

Table 3. Correlation analysis results

	1	2	3	4	5	6	7
Online consultations	1.000						
Votes	.800**	1.000				*	
Letter	.601**	.818**	1.000				
Gifts	.794**	.845**	.643**	1.000			
Appointment	.558**	.556**	.452**	.497**	1.000		
Position	-.074*	-.091*	-.002	-.040	-.055	1.000	
Level	-.064*	-.082*	-.023	-.045	-.023	-.045	1.000

*p < 0.1; **p < 0.05; ***p < 0.01

Table 4. Regression analysis results

	Non-standardized coefficient		standardized coefficient	t	Sig.	Collinear statistics	
	B	Standard error				Tolerance	VIF
Votes	8.989	.995	.554	9.031	.000***	.150	6.674
Letter	2.782	1.229	-.097	2.264	.024*	.308	3.248
Gifts	4.634	.541	.390	8.564	.000***	.271	3.687
Level	4.218	1.324	.025	1.982	.013*	.568	4.274
Position	1.722	1.512	.036	1.514	.031*	.971	1.030

*p < 0.1; **p < 0.05; ***p < 0.01

Second, doctor title (beta =8.989, P<0.05) has a significant positive effect on online appointment and offline medical treatment of online health community users, indicating that H1b has been verified. The higher the title of the doctor, the stronger the professional ability

and experience of the doctor, which has a positive effect on the online appointment and offline medical treatment behavior of the online health community users.

Thirdly, the thank-you letter (beta =2.782, P< 0.1), hospital level (beta =4.218, P< 0.1) and doctor title (beta =1.722, P< 0.1) had a significant positive effect on the online counseling behavior of online healthcare community users, indicating that H1a, H2a and H4a were verified. Thank-you notes

Table 5. Regression analysis results

	Non-standardized coefficient		standardized coefficient	t	Sig.	Collinear statistics	
	B	Standard error				Tolerance	VIF
Votes	1.159	.223	.477	5.197	.000***	.150	6.669
Letter	.040	.275	.009	.146	.084*	.308	3.246
Gifts	.169	.121	.095	1.391	.065*	.271	3.687
Level	.825	.096	.069	1.566	.098*	.327	4.322
Position	.204	.007	.028	.784	.003**	.971	1.030

*p < 0.1; **p < 0.05; ***p < 0.01

(beta = 0.04, P< 0.1), gifts (beta =0.169, P< 0.1), and hospital grades (beta =0.825, P< 0.1) had significant positive effects on online appointment and offline treatment of online health community users, indicating that H2b, H4b, H5b were verified.

5. Conclusion

People's purchase decision is closely related to trust. Based on the theory of trust, this paper puts forward the influence mechanism of users' decision on medical treatment in online healthcare community, and takes the haodaifu as an example to provide reference for the study of users' decision on medical treatment in online healthcare community. In the future, researchers can modify and extend the concept in the trust model according to the research context to understand the commonality and characteristics of the influence mechanism of user decision in different service types and situations.

From the point of practical significance, in addition to the doctor environment background information, in online healthcare communities other parameter values are given, such as letters, evaluation factors will affect the user's medical decision-making, it shows that such sites can clinic decision provides useful information for the user, is helpful to alleviate the current situation of information asymmetry between doctors. For doctors, in addition to the influence of their professional titles and hospital grades, online word-of-mouth also plays a key role in users' decision-making, so doctors can quickly build a word-of-mouth with excellent service attitude and superb medical skills to attract more users.

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