Online Selection of a Physician by Patients: The Impression Formation Perspective

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Abstract

Background:

With the rapid development of online healthcare communities, an increasing number of physicians provide services in the online healthcare communities that enable patients to consult online. However, it is difficult for patients to determine the professional level of doctors before consultation and diagnosis because of information asymmetry. A wealth of information about physicians is displayed in their profile as a new means to help patients evaluate and select quickly and accurately.

Objective:

This research explores how the profile information presented in the online healthcare communities affects patients' impression formation, especially the perception of professional capital (i.e., status capital and decisional capital). The impression further affects their consultation intention, partially mediated by the initial trust. Toulmin's model of argumentation is used to understand the strength of the argument presented in physicians' homepage information and divide it into claim, data, and backing.

Methods:

This study conducts an internet experiment and recruits 386 subjects on the internet to explore the effect of impression formation on online selection behavior by a patient.

Results:

The results show that the strength of argument has a significant positive association with the perception of professional capital. Perceptions of professional capital are highest when a fully composed argument (claim/data/backing) is included in a profile, with claim/data being the next highest and claim only the lowest. Recommendations from connections have the strongest impact. The professional capital perception, in turn, influences patients' selection decisions, which is partially mediated by initial trust.

Conclusions:

This study is of great significance to the implication for theory and practice. On the one hand, this research contributes to the online health community literature and suggests that the perception of professional capital on physicians be pre-presumed and built on the basis of the information before in-person interactive online. On the other hand, this study is helpful to understand the effect of various components included in the profile information on perceiving physicians' ability, and not all information is of the same importance.

Introduction

Background

The online healthcare communities dramatically change traditional medical services, which help patients to access medical consultation services without the limitation of time and space. In 2020, the outbreak of the corona-virus epidemic had brought a great deal of demand for online diagnosis and consultation and promoted the upgrading of requirements for online medical community services. A representative type of the online medical communities is the patient-to-doctor communities, such as “Hao Daifu online” (<https://www.haodf.com>), “Chunyu Doctor” (<https://www.chunyuyisheng.com/>) and “Jiankang Net” (<https://www.120.net>) . These websites provide a virtual forum for communication between doctors and patients in health management, health consultation[1].

For many patients, these websites have taken the place of traditional in-person methods of interaction between physicians and patients as the means to form initial impression of these physicians before health consultation. These websites enable physicians to show their personal information about their service quality and competence level to everyone who visits these online sites, including a text (e.g., description of work history) or images (e.g., profile picture). In turn, patients can examine these online pieces of information presented to form the first impressions and determine a doctor to consult online anytime and anywhere (See Figure 1) [2, 3]. In other words, these first impressions are formed based on information in the physicians’ profile information and have an anchoring effect on individuals so that online selection of a physician by patients and future interactions are affected by this initial impression[4]. As a result, this research examines the impact of information appearing in online health communities on first impression formation and how these impressions influence patients’ selection decisions.

Online Healthcare Communities

Online healthcare communities provide a richer amount of information presented about various physicians than traditional medical settings like hospitals and enable doctors to better help and serve patients by providing a variety of functions[1]. Online health communities benefit both doctors and patients in that doctors can use these functions to achieve their goals more efficiently, while patients can search for health information and suggestions that can help them to recuperate faster and more effectively. Quite a few studies have researched the benefits of online healthcare communities from different perspectives. On the one hand, doctors can not only earn a higher income (including virtual gifts and extra bonuses) but also accumulate rich clinical experience through these Internet platforms. In addition, they can achieve a higher online and offline reputation to meet their self-fulfillment needs (self-respect and being well-respected)[5]. On the other hand, Patients can access more professional medical information or diagnosis without the limitation of time and space[6], which significantly reduces the cost of outpatient visits and further enhance their health management awareness. Besides, they can freely select a suitable physician who can help them recuperate faster and effectively according to the affiliated institutions and departments in the virtual environment. It improves efficiency and efficacy of diagnosis and treatment and decreases and ameliorates doctor-patient conflict[7].

In online health communities, multiple information showed on the physicians' homepage have a significant influence on patients' decisions, and not all information has equal value[8]. Some studies confirmed the effect of patient-generated content (such as electronic word-of-mouth and digital gifts), system-generated information (like contribution-value) [7] and physician-generated information[9] on patients' behavior and decision at different stages. The electronic word-of-mouth shown on the physicians' homepage is an important source of information relied upon by patients at decision stages[10]. Information on doctor quality can also be divided into two types: subjective information and objective information. The former represents patients' emotional expressions, feedback or consultation satisfaction, while the latter is the statistical evaluation of data and not linked to the personal opinion[11].

Although the profile information on the websites is of great significance for patients' consultation intention online, the researches on the online healthcare communities mostly focus on the factors influencing information sharing behavior[12]{Hsu, 2007 #3353;Na Liu, 2017 #3358}, health information seeking on the ongoing interactive online[13, 14], information adoption at the decision-making stage[15], as well as service satisfaction and medical team performance[16]. there has been very little research exploring how the profile information on the online communities influences on patients' consultation intention at information seeking stage, and no one has considered the effects of the strength of argument presented in these pieces of information on the perception of professional level and social resource.

Impression Formation

Originated from social psychology, impression formation illustrates when individuals primarily met a stranger or formed relationship in the early stage, they make judgments based on limited information on some attributes or overall characteristics of cognitive objects, including personality traits, professional skills as well as social class. The first impression will have an anchoring effect on individuals so that future observation and interactions will be affected[17, 18]. Namely, the impression formed in the initial stage do not greatly change over time and lay a fundamental basis on the project success and decision-making. Previous studies have shown that impression formation will significantly influence the trust and preference of the cooperative partners[1]. For patients, online health websites change the way to form the first impression of physicians in lieu of face-to-face consultation. As a result, it is of profound significance to understand the effect of impression formation on consultation intention.

In the online environment, the first impression can be formed based on digital materials, such as personal information, portrait, video, and website design without face-to-face interaction. First and foremost, When users hear a new voice, they will automatically form an initial impression of the personality of the voice owner [19]. Second, previous studies have shown that the users' photo[20], age, and gender[18, 21] will produce the differences in the formation of initial impressions and profoundly influence the subsequent behavior of users. In the social networking sites, design elements of the website page, including layout and color, has an effect on the impression formation of other users and preference[22], users can examine others' characteristic through online search information "clues" which may be text(target words,

health condition, social activities, and work experiment) or image(photo, portrait) [23], and explore the strategy of self-impression management further. Existing studies mainly discussed the initial impression formation from the two aspects: the information presentation format and the inherent material properties. However, this paper understands how the impression formation on the online communities influences the perception of these physicians associating the Toulmin's model of argumentation.

The Toulmin's Model of Argumentation

The Toulmin's Model of Argumentation, as one of the most enduring theoretical models of argument, can effectively examine the strength of an information argument and has been used to research information presented in the online environment [4, 24], which focuses more on the application of logic in human situations [25]. Based on the Toulmin model of argument, the strength and persuasive of an argument depend on specific elements, including claim, data, and backing[4]. The strength of an argument increases with the addition of the above elements so that an argument with claim, data, and backing is more convincingly supported than an argument with claim and data, which is powerful than an argument with claim only. In online health communities, a doctor claims that he or she is a chief physician in a top hospital, who has been engaged in clinical, scientific research, and teaching work for many years. Nevertheless, it is not enough for patients to trust what the physician says based on a claim only, so they need to further multiple supporting data such as the treatment experience in the department, the affiliated hospital, and relative medical articles published, which is partly self-generated. Yet there is evidence suggesting that individuals are more likely to exaggerate their personal achievement and progress in the online environment[4, 26], and the initial judgement to a doctor entirely depends on a secondhand impression, whose accuracy is still questioned by many scholars[27]. Even if there is supporting data, patients may also question whether the doctor's treatment fully cures him or her, because the claim and data are all subjective information provided by the physician and lacking objectivity. To increase patients' trust, additional backing is introduced to provide a truer endorsement for the claim and data so that patients are willing to choose and consult. In this paper, we mainly focus on impression formation in the online health community. The strength of information argument will affect patients' impression formation on doctors' professional capital, and then affect their initial trust and consultation intention in online health communities.

Research Model and Hypotheses

Impression Formation and Professional Capital

Professional capital is the renewable and valuable social capital developed with good education connected with the social professionals such as doctors, teachers, and lawyers[5] because it relates to power advantage and professional commitment. In doctor-patient communication, the professional capital possessed, as an exchange resource, reflects their status in the social structure and decision-

making behavior. These resources are viewed as a form of potential identity symbol, or as the ability to dispatch and utilize resources through decision-making behavior. In consequence, the professional capital can be divided into status capital and decisional capital[28].

Status capital, unrelated to the doctor's online behavior, represents the personal and social advantages a doctor has in the social structure and is a structural strength with official certifications (e.g., education level, job title, affiliations, etc.) that can help other participants assess the personal and social advantages of social professionals and make decisions about social interactions. In online medical services, the status capital of a doctor should be determined by the social status of the doctor, that is, different academic title (e.g. professor or associate professor), clinical title (e.g. chief physician, associate chief physician, resident physician, assistant physician), and different hospital ranking and geographical differences. In general, physicians with more senior titles and positions are given higher priority and privileges, and the higher the level of the hospital they belong to, the more resources they have. In the online medical communities (OHCSs), patients can evaluate doctors based on their qualifications, including professional titles (practical certificates), academic titles (educational certificates), and affiliated hospital (organizational certificates). As a consequence, personal advantages refer to the personal qualities and attributes of social participants in the hierarchical system of doctors, such as the clinical experience and academic qualifications of doctors. Moreover, social advantages indicate that social communication participants have access to better social resources through colleagues and institutes. For example, physicians working in the top three hospitals are usually considered to work with a better co-worker and more technologically advanced equipment than those who are not. In conclusion, status capital, as a dimension of professional capital, is defined as the personal and social advantages of the structural power of social professionals. Gaining higher status capital is a long-term goal that slowly changes over time[5].

In institutionalized social structures, doctors with higher status capital tend to be more reliable and valuable. Higher professional titles illustrate that doctors are officially considered better (e.g., expert, knowledgeable, etc.), and patients are more likely to choose such physicians because they can view their statuses such as physician titles as the quality of their diagnosis or counseling. In addition, participants with strong social advantages in the social structure should have more and/or better options, which they can use to obtain more resources. Likewise, participants in a better organization tend to have greater control over resources accordingly. For instance, an excellent hospital is often associated with more qualified doctors, more advanced equipment, and even other quality hospitals. A relevant study illustrates that developed cities control more healthcare knowledge and resources. In other words, the organization (i.e., the hospital) and geographical location (i.e., the city) reflect the social advantage of doctors in terms of better resources. And patients may bring positive benefits (social and economic returns) to doctors who provide better social advantages (such as higher hospital and city levels). As a result, this study believes that status capital including the structural advantage of doctors' personal and social power, will help to make a more accurate diagnosis and give corresponding medical advice. Thus, we hypothesize:

H1a: The physician profile information composed of claim, data, and backing can result in higher perception of the status capital than those with claims and data.

H1b: The physician profile information composed of claim and data can result in higher perception of the status capital than those with claims only.

Decisional capital, considered as a decision behavior, is driven by the ability and willingness to make precise medical treatment. In contrast to status capital, physicians' decisional capital can't be identified without the dynamic interaction between physicians and patients and could be translated into exchange behavior in online counseling. To enhance decisional capital, physicians who provide online counseling services need to send to patients "signals", such as providing more counseling services and publishing more online articles, and increase trust and steer patients to online counseling services[5]. Patients can evaluate the value of doctors in OHCSs by the frequency and distribution of interactions (such as the model and quantity of sharing, the channels of online and telephone consultations, and the number of medical articles. In this way, it reflects doctors' abilities and diligence. On the one hand, the abilities include doctors' expression, judgment, insight, and inspiration in complex situations, which indicates that a doctor has rich clinical experience when making the accurate judgment of the suffering condition. On the other hand, the willingness of a physician reflects his or her attitude toward interacting with patients in OHCS and manifests the commitment to social professionals. Consequently, as another dimension of professional capital, decisional capital is defined as the ability to make correct judgments and the commitment to social occupation. According to patient comments, online service satisfaction, and the general waiting time on the doctor's homepage, patients can estimate the physicians' decisional capital. For instance, people will recognize that the physician's higher competence (e.g., making accurate judgments in complex situations) through a lot of interaction (e.g., online chat for consultation), and then increasing patients will come to seek medical advice. Meanwhile, the more frequent interaction indicates that doctors are more enthusiastic and dedicated. All above analysis leads us to the following hypothesis:

H2a: The physician profile information composed of claim, data, and backing can result in higher perception of the decisional capital than those with claims and data.

H2b: The physician profile information composed of claim and data can result in higher perception of the decisional capital than those with claims only.

Professional Capital and Initial Trust

Trust, which is critical to the study of online communities due to it has a significant impact on consumer behavior[13, 15, 24, 29], is the relationship between people, organizations, and events that refers to one person's uncertainty and expectations about another person's future behavior[30, 31] and is easily influenced by the actions of others. According to the formation stage of trust, it can be divided into initial trust and cumulative trust[32]. The initial trust is established during the first interaction[33], and occurs

when the two parties are not familiar with each other. With increasing interactions, the initial trust evolves into cumulative trust as the user gains more experience. Based on the original state of patient impression formation in the online health community(OHCS), we discuss the initial trust generated in a short time when patients browse the doctor's home page information without any prior experience, which is quite different from the accumulative trust. Previous theoretical studies on trust have shown that, although the initial trust is temporary, it still affects patients' medical choice behavior and subsequent interactions, which means that the overall trust is shaped in the context of the initial trust[32, 33]. Initial trust is mainly influenced by three factors in theory: the individual disposition to trust, institution-based trust, and cognitive-based trust[29, 34]. First, Individual disposition to trust is a personality trait that develops during childhood. Second, Institution-based trust is how safe people feel about a situation because of guarantees, safety nets, or other regulations. Third, Cognitive-based trust is established by a quick cognition or primary impression. In online health communities(OHCSs), cognitive-based trust will be affected by the information on the doctor's homepage, because patients who visit OHCSs for the first time largely generate their first impression of the doctor's professional ability from the limited information they already know, and this memory further influences the initial trust of patients (Y. Cao et al., 2020; Harrison McKnight, 1998). Accordingly, our study hypothesizes:

H3a: In online health communities, physicians' status capital has positive effects on patients' initial trust.

H3b: In online health communities, physicians' decisional capital has positive effects on patients' initial trust.

Initial Trust and Consultation Intention

Existing studies have proven that users usually decide whether to adopt a service according to trust assessments when the new service is not well known to the public and involves uncertainty or potential risks. In this process, initial trust plays a crucial role in eliminating perceived risk and uncertainty in interaction[32]. Compared with traditional medical services, online health communities exist higher uncertainty and risk, online patients actively seek doctors who are capable of solving diseases in their mind through the Internet and then look for medical consultation services, medical advice, and solutions. Given the influence of initial trust on the willingness of patients to choose their doctor for consultation[15, 33], we set up the theoretical model as shown in Figure 2 and put forward the hypothesis 4:

H4: In online health communities, patients' initial trust has a positive impact on their consultation intentions.

Methods

Independent Variables

This study manipulated the strength of argument (i.e., claim only, claim/data, and claim/data/backing) and explores the influence on the perception of professional capital (status capital and decisional capital). Earlier studies have shown that users can deal with the information displayed in an online environment[10] and information coming from offline has no significant effect on the behaviors of patients' online consultations[35]. Therefore, the emphasis is on changing the strength of the argument (its information constitution) showed on the doctors' homepage to control the parameter types. By presenting three types of information about claim only, claim/data, and claim/data/backing randomly to the subjects, they can identify and evaluate the doctors' professional capital.

Dependent Variables

This article has four dependent variables (status capital, decisional capital, initial trust, and consultation intention), measured through the Likert questionnaire using 1 (strongly disagree) to 5 (strongly agree), see Appendix B. The items for status capital and decisional capital were developed based on the conceptual definition and scales form prior researches[5, 16, 28]. Initial trust items adopt for current study to evaluate individual trust in the first interaction process[32]. For consultation intention, items based on Gong et al [2019] measured is developed to predict patients' behaviors of selection[10].

Procedures

This study conducts an internet experiment and recruits the subjects on the internet. The subjects are allocated to one of three situations. At first, the subjects need to fill their demographic information with an initial questionnaire. After the task description, the participants were randomly assigned to one of the potential physicians' profiles information: claim only, claim/data, claim/data/backing, and one part of the information is used to display doctors' status capital, while the other part is to present their decisional capital. The subjects evaluated the two dimensions of professional capital and consultation intention. By controlling the IP address that only takes part in one experiment and setting an answering time, we can avoid problems of the repeated subjects and low participation, which ensures a high-level internal validity and external validity of the experiment.

Results

Descriptive Statistics

In this study, gender, age and the use of the online healthcare community will be fed into the observation of individual samples' characteristics. In a sample of 386, 56.5 percent is female, while male accounts for 43.5 percent. Their ages focus on the range from 18 to 35, and about 95 percent of the subjects hold post-school qualifications. You can refer to Table 1 to know more about the result of frequency analysis about demographic variables.

Table 1. Statistical description of the sample.

Variables	n	Percent	Mean	Standard Deviation
Gender				
Male	168	43.5	1.56	.496
Female	218	56.5		
Education				
Senior high school and below	22	5.7	2.883	.815
Junior college	78	20.2		
Undergraduate	218	56.5		
Master	59	15.3		
Doctor	9	2.3		
Age(years)				
≤ 24	135	35.0	2.16	1.106
25–30	112	29.0		
31–35	95	24.6		
36–40	29	7.5		
> 40	15	3.9		

Measurement Model

Sample data can meet the requirement of normal distribution and homogeneity of variance ($L(1.384) = 1.737, P > .05$). We use SPSS17.0 and Smart PLS to make a reliability analysis that shows the accuracy and precision of the questionnaire. We can evaluate it by checking Cronbach' s Alpha values. The values of reliability coefficients, an index used to describe the reliability, are 0 to 1. When it is closer to 1, its reliability is higher. According to the overall reliability coefficients, the Cronbach coefficient after standardization is .931 (Table 2), which means having greatly high reliability. Cronbach' s Alpha values which are deleted are less than the overall reliability coefficients which are standardized, while their values are all greater than 0.7 (Table 3). Therefore, content dimensions (status capital, decision capital, initial trust, and consultation intention) do not need to be adjusted, and our scale remains at a high level of reliability.

Table 2
The overall result of reliability analysis.

Cronbach's Alpha	The number of items
.931	14

Table 3
The items' result of reliability analysis.

Construct	Factor loading	Cronbach's Alpha	T-statistic	rho_A
Decisional Capital				
DC1	.788	.813	29.65	.788
DC2	.780		32.53	
DC3	.776		27.27	
DC4	.782		32.10	
Status Capital				
SC1	.765	.797	27.26	.788
SC2	.777		27.90	
SC3	.762		28.05	
SC4	.799		32.20	
Initial Trust				
IT1	.802	.791	32.70	.767
IT2	.827		43.20	
IT3	.847		44.30	
Consultation Intention				
CI1	.839	.806	39.10	.78
CI2	.808		32.20	
CI3	.856		55.96	

The validity was measured to validate the extent to which the concept of interest is accurately represented in the measurement scale, and convergent validity and discriminant validity were assessed to examine the overall validity of the model. For convergent validity, composite reliability and average variance extracted were evaluated. As shown in Table 4, composite reliability (CR) is all greater than 0.7, and the average variance extracted is above the recommended minimum of 0.50, ranging from 0.6 to 0.7. This result provides support for convergent validity in the current model. In terms of discriminant validity,

the square roots of the average variance extracted between constructs were found to be greater than correlation across constructs, which suggesting discriminant validity.

Table 4
the result of validity analysis.

Construct	CR	AVE	Correlation matrix			
			CI	DC	IT	SC
CI	.873	.697	.835			
DC	.863	.611	.747**	.782		
IT	.865	.681	.763**	.779**	.825	
SC	.858	.602	.776**	.755**	.768**	.776
** When the confidence level (two-sided) is 0.01, the correlation is significant						
CI: Consultation						

DC: Decisional Capital

IT: Initial Trust;

SC: Status Capital

CR: Composite Reliability

AVE: average variance extracted

Structural Model

The Structural Equation Model (SEM) was conducted using AMOS 21.0. Absolute fit index(CMIN/DF, GFI, AGFI, RMSEA) and relative fit index (NFI, IFI, CFI) were calculated for evaluating the degree of model fit. As shown in Table 5, CMIN/DF (1.855)<3, RMSEA(0.047)<.05, while the other indexes are all greater than 0.85, which confirms a good fit of the current model.

Table 5
the fit index of confirmative factor

	CMIN/DF	GFI	AGFI	RMSEA	NFI	IFI	CFI
Standard value	< 3	> 0.85	> 0.85	< 0.1	> 0.85	> 0.85	> 0.85
Test value	1.855	.957	.933	.047	.956	.979	.979

H1 and H2 respectively examine the difference of perception of professional capital as the strength of argument grow gradually: Claim only, Claim/Data, Claim/Data/Backing. Analysis of Variance (ANOVAs) was conducted and found a significant mean difference for all dimensions of professional capital across

the strength of argument including in the physicians' profile information, see Table 6. This result suggests the argument strength of information has a great influence on the perception of decisional capital and status capital, supporting H1 and H2. In addition, a follow-up post hoc Ryan-Einot-Gabriel-Welsch F test was conducted to understand how the specific treatments were different from one another. The results show that the personal information fully composed of Claim/Data/Baking results in the higher impression of decisional capital so does the impression of social capital, supporting H1a and H2a. The information including both claim and data has greater perception of decisional capital and status capital than these information with claim only. This result supports H1b and H2b. Mostly important, the backing has stronger impact.

Table 6
Results of Analysis of Variance

	n	DC	SC
Claim	140	14.70 ^b (2.58)	14.61 ^b (2.75)
Claim/Data	118	15.12 ^b (2.56)	15.14 ^b (2.71)
Claim/Data/Baking	128	17.02 ^a (2.53)	16.56 ^a (2.61)
F value		30.31***	18.53***
Notes: there are significant differences in the Mean and Standard Deviation of professional capital (decision capital and status capital) under different levels of physician's information argumentation. The different letters between the treatments indicate significant differences (Ryan-Einot-Gabriel-Welsch F, $p < 0.05$). *** $P < 0.001$.			

H3 states that the impression formation of professional capital would positively impacts a patient's initial trust, and H4 illustrate the initial trust' impact on the consultation intention. Given the analysis result, it is status capital ($t = 6.608$, $\beta = 0.416$, $p < 0.001$) and decisional capital ($t = 7.382$, $\beta = 0.465$, $p < 0.001$) that are influential in forming initial trust, and initial trust significantly positive influenced the patients' consulting selection ($t = 23.953$, $\beta = 0.286$, $p < 0.001$). See Table 7.

H3 and H4 suggest that initial trust mediates the impact of professional capital on the overall consulting intention. In this paper, the Bootstrap test method was used to verify the mediation effect and carried out repeated sampling 5000 times. As shown in Table 7, decisional capital ($t = 3.718$, $\beta = 0.133$, $p < 0.001$) and status capital ($t = 3.237$, $\beta = 0.119$, $p < 0.001$) have significant indirect effects on the consultation intention. Furthermore, decisional capital ($t = 4.055$, $\beta = 0.245$, $p < 0.001$) and status capital ($T = 5.972$, $\beta = 0.373$, $p < 0.001$) has a significant direct impact on the consultation intention. Therefore, this study proves that initial trust plays a partial mediating role in professional capital and consultation intention.

Table 7
The Structural Model Assessment for Direct and Indirect Effects

Effect	Sample Mean	Standard Deviation	Std β	T Value
Direct effect				
DC->CI	.248	.060	.245	4.055***
DC->IT	.466	.063	.465	7.382***
IT->CI	.285	.070	.286	4.081***
SC->CI	.369	.062	.373	5.972***
SC->IT	.414	.063	.416	6.608***
Indirect effect				
DC->IT->CI	.356	.051	.133	3.718***
SC->IT->CI	.319	.052	.119	3.237***
***p < 0.001				

Discussion

Principal Findings

In the online healthcare community, the majority of patients have little knowledge of these doctors prior to the consultation online, especially their service quality and professional level. This paper studies the effect of the strength of the argument in the physicians' profile information on the initial perception of professional capital when knowing nothing about these physicians, which further has a positive impact on consultation intention to these physicians. The result suggests that the strength of the argument (i.e., claim only, claim/data, claim/data/backing) composed of physicians' homepage positive influences the initial impression of professional capital, suggesting the profile information on the health platform may be effective for forming initial judgements. In turn, these impression affects the patients' choice, in which is mediated by trust. In other words, the perception of professional capital goes higher with the increase of the strength of argument presented in the doctor's information, the patients are more likely to believe them and choose the doctor for online consultation on the online health communities. However, not all dimension of perception capital perceptions is influenced in the same way as the strength of argument increases. The increase of the strength of argument included in the physicians' information has a stronger impact on the impression formation of decisional capital. First of all, this is because the average title of doctors who participated in the online communities is above the level of associate chief physicians, of which 90% engage in clinical and research work in the top three hospitals. There is no significant difference in physician' title and affiliated hospital, in which it has little effect on perception of status capital. Besides, patients pay more attention to the accuracy and efficiency of physicians' diagnosis in mediated environment.

Perceptions of professional capital (status capital and decisional capital) are highest when a fully composed argument (claim/data/backing) is included in a profile, with claim/data being the next highest and claim only the lowest. Recommendations from others have the strongest impact, with the self-generated claim with data having a stronger impact than just a self-generated claim. The reason is that individuals tend to exaggerate their abilities in an online environment, and information from others (such as electronic word-of-mouth) is more objective, convincing, and trustworthy. Meanwhile, the individual has a greater sense of identification with others who have identical illnesses or similar symptoms, and their recommendations and suggestions are vulnerable to be acceptable. Finally, initial trust mediated the effect of perception of professional capital on the patients' consultation intention online. According to the personal information displayed on the physicians' homepage, patients make an initial judgment about their status and capacity. patients are willing to believe that doctors with higher status and decision-making ability are more helpful and therefore more likely to choose this kind of physicians.

Limitation and Future Research Directions

This research has the usual limitations of experimental research. This experiment is conducted online to recruited participants and collect data. The scene-based vignette take the place of the actual situation in the online medical community. Some researchers still have doubts about the online experiment and believe that the participate in online experiments are not representative. There exist problems with repeated subjects and low participation. However, this study focus on the effect of information including in the physicians' homepage on patients' consultation intention in the online healthcare communities. It is the subjects that are groups who become familiar with network. Therefore, it is considered that the recruitment of participants through the Internet is more representative. In addition, the time and IP address control for answering questions can effectively avoid repeated subjects and low participation questions.

This research extends a new perspective to the online medical communities and focuses on impressions formation of professional capital before physician-patient interactive. The contents of the profiles presented in this study were all positive, which is typical of research using the Toulmin's model. Future research needs to examine the impact of negative information presented in the profiles on patients' information evaluation. In addition, Future research should further examine difference features of patients and physicians to understand information processing.

Implication for Research

A large number of physicians provide medical service in the online medical communities, whose competence and service quality are uneven. Due to the limitation of information, it is difficult for patients to evaluate the physicians' service quality and competence and decide which one to consult after visit the physicians' homepage. Poor choice often reduces the efficiency and effectiveness of diagnosis and treatment. As a result, this paper examines (1) the impact of information appearing in the online

healthcare communities on the impression of physicians' profession and (2) how these first impressions influence patients' choice.

First of all, there is plenty of theory or research on information sharing behavior and service satisfaction during the online physician service delivery process. Our study suggests that, from the perspective of impression formation, the strength of argument demonstrated has a great influence on the patients' initial impression of professional quality and social status as they begin to search on the physicians' personal websites without individual interactive, and these impressions often set the basis for future physician-patient interactions. It is believed this calls for more theory and research on impression formation on healthcare websites.

Secondly, Minimal research has examined the model of argumentation (the Toulmin' Model of Argumentation) within online healthcare communities. This research expands on the model of argumentation by showing that the strength of the argument is significant in medical websites; specifically, personal information is classified into different strengths (e.g., claim, data, backing) and has various values. Recommendation from patients with similar illnesses had a stronger effect on the initial impression of decisional capital. Results suggest that the argumentation model provides a framework to understand the perception formation process when information is provided online.

Finally, the research on professional capital shows that the perception of status capital and decisional capital can develop through continuous interaction. However, this study suggests that it can be pre-presumed and built on the basis of the information before in-person interactive online.

Implication for Practice

The results from this paper have several significant implications for the online healthcare websites, physicians, and patients. The various types of physician information presented in these websites can greatly determine how physicians are perceived by patients on the status and professional ability, which in turn will affect patients' consulting intention. Results demonstrate that patients generally use various components included in the profile information to perceive physicians' ability before consultation and interact online. Mostly, not all information is of the same importance.

For the online medical community, it is possible to determine the different information compositions of these homepages to build the impression of their professional capital and adjust the way their information is presented. The information on physicians' training, specialties, and effectiveness of the treatments should be underlined to improve the perception of professional capital. Additionally, the findings suggest that patients can spend their effort and time on certain features over others. For instance, the recommendation from these people with a similar situation is paid more attention in the online environment. By adjusting the layout of the homepage can influence professional capital impressions and a sense of trust. In this way, it is helpful for patients to form perceptions primarily on physicians' professional features and greatly increase the number of consultations for their patients on

these websites. Besides, it is also possible to dispatch medical resources appropriately from technology and mode, improving the effectiveness and precise of diagnosis and treatment on the online medical community.

Most physicians can use impression management to enhance their professional image in the mediated environment. Especially, they should attach importance to the design of their homepage from status and decision-making aspects, especially about the recommendation from others. Tring to focus on professional competence can attract new patients and accumulated plenty of clinical experience, through which physicians can achieve economic and social returns. Furthermore, it provides an opportunity for some capable but unknown doctors to be known by everyone. It can also distribute consultations for celebrity physicians, alleviating the problem of unbalanced allocation of medical resources to a certain extent.

From the patient perspective, the profile information websites can reduce information asymmetry, perceived risk, and lack of trust currently plaguing the virtual environment. This study illustrates that viewing the physicians' homepage can help in forming initial professional impressions that may attribute to build trust relationships during early interactions as well as learn more about physicians.

Conclusion

An increasing number of physicians with the various hospitals provide medical service in the online healthcare communities. Patients can find a wealth of information about physicians displayed on their homepage and visit a physician after browsing this information. Therefore, this study focus on, from the perspective of impression formation, the online selection of a physician by patients. The result finds that the difference of argument strength displayed on the physicians' homepage has a significant influence on the perception of professional capital. The perception indirectly impacts the selection behavior of a patient through initial trust.

Abbreviations

OHCSs: Online health communities.

Declarations

Ethics approval and consent to participate

This research was approved by the China Three Gorges University Institutional Review Board(IRB2022FA001). Informed consent was obtained from all subjects. Participants viewed a brief consent statement on the first screen of the survey before clicking to proceed, indicating their consent to participate. The methods of this study were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Not applicable.

Authors' contributions

Chen Duan contributed to designing the study. The selection and evaluation of the papers and data Collection were done by Chen Duan, Zhengwei Huang and Yanni Yang. Chen Duan, Zhengwei Huang and Yanni Yang participated in drafting the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used and analyzed during the current study are available from its supplementary information files.

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Supplemental Data

Appendix is not available with this version.

Figures

Figure 1
An Example of a Physician's Profile Information

Figure 2
Theoretical Model.