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ANALYZING THE PATIENT'S PURCHASING DECISION BETWEEN CONVENTIONAL AND VIRTUAL MEDICAL CONSULTATION SERVICES USING A PANEL MODEL

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Abstract

Online medical consultation service is a telemedicine service that enables virtual connection to doctors for patients. It has been widely used by patients and has several potential benefits. Despite this, some patients continue to have reservations over consultation methods and results, the majority of which entail physician interaction. This research aims to examine the impact of patients' purchase decisions between conventional and virtual medical consultation services. Due to the expansion of healthcare apps and online platforms, individuals in several regions of the world may now get medical care from the comfort of their own homes. This study analyses and compiles user ratings for five major platforms that provide video consultations with board-certified doctors via computer and mobile device. All of these systems have huge user communities, including MDLive, Doctor on Demand, American Well, HealthTap, and Teladoc. The study's findings give proof for physicians to boost their online medical consultation service sales. Reputation, service pricing, service information volume, and service response speed of an online medical consultation service have a good effect on the doctor's overall service revenue, hence bolstering the doctor's income growth. This study's findings are useful for understanding how people digest information while buying online medical consultation services. Our results add to the existing literature on service feedback in telemedicine marketplaces and give relevant stakeholders with information on how to develop an effective feedback system to enhance patients' service experience and doctors' involvement.

Keywords: Online Medical Consultation Service, Doctor's Reputation, Service Price, Service Information Volume and Service Response Speed

BACKGROUND

Medical consultation service (MCS) has become a crucial service platform for people to contact with doctors or physicians in order to acquire treatment and relevant medical information (Liu, Tong & Chan, 2017). Without the limits of time and distance in offline or traditional patient-physician interactions, the medical consultation service allows patients to save money and time on medical care (Yang, Guo & Wu, 2015). In addition, physicians in such marketplaces may communicate with patients to collect illness information and enhance their reputation as medical consultation providers (Guo et al., 2017) Therefore, medical consultation services are

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helpful for both patients and physicians in the context of patient decision making (Zhang et al., 2018).

Despite this, the expansion of the telemedicine business confronts several obstacles. On the one hand, people must be careful when selecting a physician since health care services are life and death (Yang et al., 2018) Due to information asymmetry and lack of professional health care expertise, it is challenging for patients to determine a doctor's reputation and service quality based on the minimal information and knowledge they acquire (Yaraghi et al., 2018). Online medical consultation services should give appropriate and efficient information to assist patients in making informed choices. On the other hand, physicians' efforts (such as offering consultation services and health care information to patients) are essential to the growth of medical consultation (Guo et al., 2017). As a result of their intense workload in hospitals and other medical institutions, physicians find participation and contribution to medical consultations to be a hardship. Thus, both patients and physicians face obstacles while using the medical consultation service. Understanding how to allow patients to make informed decisions and support physicians' participation has become a management priority for practitioners of online medical consultation.

Online reviews are recognized as a vital informational resource for helping customers evaluate the quality of services and goods and interacting with sellers, service providers, and other consumers (Mishra et al., 2018). With the expansion of medical consultation services, widespread use of online feedback has been included in these services (Liu et al., 2016). Patients may use the service feedback system to assess the quality of doctors' services and decrease information asymmetry in online health consultations (Gao et al., 2015). Such feedback has evolved into an effective method for patients to make informed choices. However, feedback systems have been researched primarily in the context of electronic commerce, despite the fact that the present techniques have certain drawbacks (Anderson & Simester, 2014). Generally, it is free for providers to provide feedback online, which might lead to the proliferation of fraudulent and inflated reviews that influence customers' perceptions of service quality. Therefore, in the online medical consultation service, a new system for providing feedback on the service quality of physicians should be devised.

Recently, a new sort of service feedback, telemedicine feedback, has been used to the online medical consultation service. Patients who are pleased with a physician's online service may purchase a virtual gift or leave a tip. This telemedicine feedback may boost the accuracy of service feedback and decrease the amount of erroneous information by enhancing the reputation of feedback providers. In addition, this form of feedback may provide physicians with reputational and monetary advantages, drive their online participation, and improve service quality. Consequently, telemedicine feedback may have a favourable influence on patients' and doctors' behaviour in telemedicine marketplaces and may partially replace the function of conventional medical service feedback. However, this novel feedback mechanism has received little study attention, much alone potential advantages for medical consulting services.

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OBJECTIVES

In spite of the widespread use of service feedback in medical consultations, empirical research is still weak in two crucial areas. First, there is a paucity of research that compares the effects of conventional versus virtual medical consultation services. Prior research has largely disregarded the availability of virtual medical consultation services (Yang et al., 2015), focusing instead on the function of conventional medical consultation services. Second, while there have been several studies examining the impact of online feedback on patient behaviour (Liu et al., 2016), these implications on the patient's purchase choice have received less attention. Doctors give consultation services, expertise, and information to assist patients in understanding their condition and receiving treatment, as well as fostering the long-term growth of medical consultation services. Consequently, it is essential to evaluate the effect of feedback on physician participation. To address these research gaps, the following research questions will guide this study:

1. When patients purchase medical consulting services, what uncertainties do patients have during MCS and how do these uncertainties affect patients' satisfaction towards the consultation?
2. What is the service quality that influence the purchasing behavior of patients' consulting services in the online medical consulting platform?

RESEARCH HYPOTHESES

We integrated the theories of signaling and self-determination to develop our study model and formulate our hypotheses. Our research investigates the impact of conventional and virtual medical consulting services on patient satisfaction with the purchase decision process.

Information asymmetry often refers to a scenario in which some persons have access to more data than others (Spence, 1973). The notion of signaling may help us comprehend individual behaviour and eliminate information asymmetry (Connelly et al., 2010). This idea suggests that effective signals may assist people in evaluating the quality of a service or product and influence their decisions. A signal must exhibit crucial qualities, such as cost, in order to be valuable (Cai et al., 2016). Cost of a signal refers to the amount spent when a signal was sent. The cost of a signal is proportional to its value and is the foundation of signaling theory (Bliege Bird & Smith, 2005).

In medical consultation services, people lack adequate knowledge to comprehend the quality of physicians' service, resulting in information asymmetry (Liu et al., 2016). Virtual medical consultation services are recognized as a viable remedy for the problem of information asymmetry. Previous research has shown that the online MSC mechanism may foster trust and cooperation amongst users in a virtual setting. Online MSC may be a valuable indicator for patients to gauge service quality since such MSC comes from patients who have used the service and is more accurate than information directly from service platforms and physicians (Yang et al., 2015).

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Although both conventional and virtual medical consultation services are helpful in influencing patients' decisions and judgements, the qualities of these two forms of MCS are notably distinct. According to the theory of signaling (Connelly et al., 2010), the cost of signals determines their intensity. Virtual MCS is more expensive than conventional MCS because patients must pay expenses associated with the online MCS. This indicates that such a paid system raises the cost to the supplier and minimizes the amount of false and exaggerated input. Therefore, since the value of virtual MCS is more than that of conventional mode, the platform's dependability and strength are superior (Bliege Bird & Smith, 2005). Patients will depend increasingly heavily on virtual MCS when determining the quality of a physician's services. We thus hypothesized the following:

Hypothesis 1: Reputation positively affects patient service purchase behavior.

Hypothesis 2: Price positively affects patient service purchase behavior.

According to the signaling hypothesis, a strong signal will reduce the behavioural impact of a weak signal (Fischer & Reuber, 2007). Strong and weak signals influence individual decision making in a complementary manner (Cai et al., 2016). Because classical MCS is used by telemedicine platforms to influence patients' decisions in medical consultation services, consumers may interpret this feedback as physicians' marketing techniques and develop skepticism. Patients are likely to perceive virtual MCS as a stronger signal than conventional MCS due to the increased cost. Virtual MCS may reduce patients' suspicion and fulfil the function of an online platform in connection to their selections. Consequently, when conventional and virtual medical consultation services compete in telemedicine marketplaces, these two forms of MCS may have a substantial impact on patients' selections. Consequently, we further postulated the following:

Hypothesis 3a: The amount of information in the service process positively affects patient service purchase behavior.

Hypothesis 3b: The response speed of the service process positively affects patient service purchase behavior

Self-determination theory is effective for elucidating the motivations behind human conduct (Ryan & Deci, 2000). This idea suggests that people are conditioned to act in a certain manner if they are able to receive the required value to meet their fundamental psychological requirements (Sun, Fang & Lim, 2012). Individuals might gain gratification from extrinsic motivators even if they are not interested in the particular conduct or activity (Gagné & Deci, 2005). Furthermore, we hypothesized the following:

Hypothesis 4a: When the online medical consultation service market is highly competitive, doctor reputation has a greater impact on patient service purchase behavior

Hypothesis 4b: When the competition in the online medical consultation service market is high, the service price will have a greater impact on the patient's service purchase behavior

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Hypothesis 4c: When the online medical consultation service market has a high degree of competition, the impact of service information on patient service purchase behavior is reduced

Hypothesis 4d: When the online medical consultation service market is highly competitive, the impact of service response speed on patient service purchase behavior is reduced

In the MCS marketplaces, physicians contribute mostly via consulting services and the exchange of health care information. As information and knowledge are their own property (Sun, Fang, & Lim, 2012), the contribution of physicians is driven by a number of factors. Prior research has shown that a suitable extrinsic incentive (such as reputation or money) may fulfil the intrinsic needs of people and motivate their conduct. A virtual platform for patients with telemedicine service experience may assist physicians in establishing their reputation and meeting their reputational demands. However, this sort of platform is incapable of meeting their economic requirements. In addition to reputational advantages, virtual MCS may provide monetary rewards that improve the financial status of clinicians. These monetary and reputational awards will recompense physicians for their time and effort. Self-determination theory states that the intensity of various motivators relies on the degree to which an individual's inner needs are met. Thus, compared to conventional MCS, virtual MCS may more effectively fulfil physicians' reputation and monetary incentive, exerting a greater impact on their contributing behaviours. Subsequently, we postulated the following:

Hypothesis 5a: When the disease risk is high, doctor reputation has a greater impact on patient service purchase behavior

Hypothesis 5b: When the disease risk is high, the service price has a greater impact on the patient's service purchase behavior

Hypothesis 5c: When the disease risk is high, the amount of service information has less influence on patients' service purchase behavior

Hypothesis 5d: When the disease risk is high, the impact of service response speed on patients' service purchase behavior is reduced

RESEARCH DESIGN

To evaluate the assumptions of this study, relevant information and data were acquired from a major telemedicine market in China, notably MDLive, Doctor on Demand, American Well, HealthTap, and Teladoc (Haodf, 2019). This platform enables patients to consult physicians about their health concerns and get associated recommendations from physicians. In addition, these platforms provide an abundance of medical consulting services to assist consumers eliminate information asymmetry and make educated decisions about the services or physicians they choose or need. This platform supplied adequate information for this investigation, including physicians' occupational titles, hospital rating, service charge, doctor's reputation, volume of information, and response speed.

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This paper's research methodology is as follows. First, we constructed a 2-equation panel model to examine the impact of conventional and virtual medical consultation services on patients' choice and, correspondingly, physicians' participation. Second, we used a model with fixed effects to estimate patient preference and physician contribution. This approach primarily handles the fixed differences at the doctoral level between our research goals. This research also calculated a random effect model for patient selection and physician participation. This model primarily adjusts for the random effects of research aims over several time intervals. In line with a previously used technique (Lin, 2014), we analyzed the coefficient of conventional and virtual medical consultation services to determine the relative strengths of the roles of the aforementioned two forms of MCS.

Participants and Data

Due to the spread of healthcare apps and online platforms, individuals in many areas of the world may now get medical care from the comfort of their own homes. This study analyses and compiles user ratings for five major platforms that provide video consultations with board-certified doctors via computer and mobile device. All of these systems have huge user communities, including MDLive, Doctor on Demand, American Well, HealthTap, and Teladoc. The chosen systems are proprietary and not issued as standard. The reviews included in this research were supplied by patients who contacted doctors through these platforms. In practice, users of such systems may assume a variety of roles, such as doctors, nurses, patients, etc. In this study, the views of other patients were discarded in favour of the patient's own. The only focus was on patients' visits to doctors through these platforms, rather than healthcare in general or any other viewpoint (e.g., searching for information or storing personal medical records).

In our study model, two dependent variables were considered. For the behavioural equations of patients and physicians, several variables were used. The dependent variable in the patients' choice equation was the number of patients consulted by the doctor. In agreement with a recent research (Yang et al., 2015), we used this measure as a surrogate for patients' preferences. The dependent variable in the doctors' contribution equation was the service sale of doctors' contribution in MCS marketplaces. The technology of the platform automatically created an index that reflected physicians' contributing behaviours, i.e. service sales, based on our study environment. Using the doctor's reputation, technical title, and department, the service sales were determined. This variable was used to determine the degree of physicians' input to MCS marketplaces.

The independent variables in our 2-equation panel model were the number of conventional and virtual MCS items. In our study environment, patients provide two forms of good service feedback: thank-you letters and virtual presents. After an online consultation, if a patient is pleased with the doctor's service, he or she may show gratitude by writing a note of thanks or purchasing a virtual gift. The thanksgiving letter is a text service feedback that people utilize to provide feedback on the service process and quality provided by their doctor. The virtual gift resembles a digital card that patients may use to show their gratitude for a doctor's service. Both thank-you letters and virtual gifts may assist patients provide feedback on their experience

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and help physicians build their internet reputation. The difference between gratitude letters and virtual presents is that the former is free, while the latter are paid for by patients. Doctors may get monetary awards according to the cost of virtual presents. Both thank-you letters and virtual gifts are related with good comments about the service quality of a physician. Consequently, this research used these two variables as surrogates for conventional and virtual MCS, respectively.

In addition, as control variables in our study model, we included physicians' professional title ranking, hospital status, and the number of patients who had visited the physician's homepage. Occupational title ranking refers to the offline hospital position rating of a physician. Hospital standing refers to the ranking a hospital receives from a professional health group or the government. These rankings may represent doctors' professional position to patients, influencing their judgement and decision-making. For physicians, their professional position may be linked to their inner needs, influencing their contributing behaviours. Consequently, these two variables were included as control variables in the two-equation model. The occupational title ranks for director, deputy director, chief physician, and resident physician are accordingly stated as 4, 2, 1, and 1. The ranks of hospitals, from top to lowest, are denoted as follows: A hospital, a hospital of class B, a hospital of class C, and a hospital of class D. In this article, we have ranked hospitals from highest to lowest using the numbers 4, 2, 2, and 1. Moreover, the advertising of telemedicine marketplaces may boost the number of people who visit a physician's website. Patients who pick a physician will grow when the number of patients who viewed his or her website is significant. In the patients' choice equation, we thus included the number of patients who visited the doctor's webpage as an extra control variable.

The variables included in our study model are detailed in Table 1. There is no substantial multicollinearity among the independent variables, as shown by Table 2's descriptive statistics of the variables and Table 3's correlations of the major variables in the study model.

Table 1: Variables and Their Descriptions

Variable Name	Variable ID	Variable Description
Paid limited consulting service sales	Sale Paid Restric	The total number of patients who purchased doctor-paid consultation services with limited information. That is, the sales of text consulting services that pay to answer three questions.
Paid Unlimited Consulting Service Sales	Sale Paid Unrestrict	The total number of patients who purchased the doctor's paid unlimited information consultation service. That's the sales of text consulting services that pay to answer all questions for a week.
Paid Consulting Services Local Sales	Sale Local	The total number of times that patients in the province and municipality purchased doctor-paid text consultation services
Paid Consulting Services Overseas Sales	Sale Non local	The total number of times that patients from other provinces and municipalities purchased doctor-paid text consultation services

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Service fee	Price	Get the lowest price for a doctor's text consultation
Doctor's reputation	Rating	The recommendation popularity of the good doctor's online doctor's personal homepage, the value is obtained from the comprehensive patient evaluation of the good doctor platform
Technical titles	Title	The values include director, deputy director, chief doctor, and resident doctor.
Department	Department	According to the division of Good Doctor Online, the departments are divided into pediatric obstetrics and gynecology, surgery, traditional Chinese medicine, internal medicine, ENT, dermatology, oncology, psychiatry and other departments, and use dummy variables to measure. The values are Gynecology Obstetrics Pediatrics (GOP), Surgery (Surgery), Traditional Chinese Medicine (TCM), Internal Medicine (IM), Ophthalmology (Otorhinolaryngology, OO), Dermatology (Dermatology), Oncology (Cancer), Psychiatry (Psychiatry)
Hospital level	Hospital_Level	The hospital rankings from highest to lowest are referred toas follows: A class hospital, B class hospital, C class hospital,and D class hospital
Total number of patients	TotalPatients	Total number of patients online
Total contribution	Contribution	The doctor's contribution value on Good Doctor Online is calculated by the website based on the information service of the doctor on the website.
Total visits	Total Visits	The total number of visits to a doctor's homepage.

Table 2: Descriptive Statistics of Focus Variables

variable name	Number of samples	mean	standard deviation	minimum	maximum value
Sales	25,048	4.5190	16.1311	0	521
Income	25,048	258.7839	1574.9340	0	77655
Reply Speed	25,048	0.5259	0.4422	0	1
Info Amount	25,048	30.3160	18.9793	1	711
Price	25,048	37.3075	47.9802	1	955
Rating	25,048	3.8540	0.3537	1.7	5
Competitors	25,048	0.6264	0.4838	0	1
Risk	25,048	0.5288	0.4992	0	1

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Table 3: Correlation Analysis of Major Variables

	Sales	Income	Info Amount	Reply Speed	Price	Rating	Competitors
Income	0.7938	1					
Info Amount	-0.0508	-0.0246	1				
Reply Speed	0.2141	0.1305	-0.0871	1			
Price	0.2514	0.3452	-0.0448	0.0346	1		
Rating	0.4027	0.3116	-0.127	0.3745	0.3963	1	
Competitors	-0.0235	-0.0083	0.0568	0.0288	-0.0221	-0.0108	1
Risk	0.0017	0.008	-0.0519	-0.0256	0.0318	0.075	0.4457

RESEARCH MODEL

Sales in this study are non-negative integers and are unevenly distributed. Consistent with literature review, this section will continue to use negative binomial regression to estimate the model. Based on the sales impact model and the definition of variables proposed in the previous section, the main effects regression model is as follows:

$$\ln E(Sales_i \mid X_i) = \beta_0 + \beta_1 InfoAmount_i + \beta_2 ReplySpeed_i + \beta_3 Price_i + \beta_4 Rating_i + \sum \gamma ControlVariables_i + \varepsilon_i$$

Among them, β is the variable regression coefficient and ε is the error term. The moderating effect regression model is as follows:

$$\ln E(Sales_i \mid X_i) = \beta_0 + \beta_1 InfoAmount_i + \beta_2 ReplySpeed_i + \beta_3 Price_i + \beta_4 Rating_i + \beta_5 Competitors_i + \beta_6 Risk_i + \beta_7 InfoAmount_i * Competitors_i + \beta_8 ReplySpeed_i * Competitors_i + \beta_9 Price_i * Competitors_i + \beta_{10} Rating_i * Competitors_i + \beta_{11} InfoAmount_i * Risk_i + \beta_{12} ReplySpeed_i * Risk_i + \beta_{13} Price_i * Risk_i + \beta_{14} Rating_i * Risk_i + \sum \gamma ControlVariables_i + \varepsilon_i$$

The sales impact model is fitted by a multiple regression analysis model. The specific model is as follows:

$$Income_i = \beta_0 + \beta_1 InfoAmount_i + \beta_2 ReplySpeed_i + \beta_3 Price_i + \beta_4 Rating_i + \beta_5 Competitors_i + \beta_6 Risk_i + \beta_7 InfoAmount_i * Competitors_i + \beta_8 ReplySpeed_i * Competitors_i + \beta_9 Price_i * Competitors_i + \beta_{10} Rating_i * Competitors_i + \beta_{11} InfoAmount_i * Risk_i + \beta_{12} ReplySpeed_i * Risk_i + \beta_{13} Price_i * Risk_i + \beta_{14} Rating_i * Risk_i + \sum \gamma ControlVariables_i + \varepsilon_i$$

Model Estimation

At the 0.01 significance level, the coefficients of the independent variables Rating, Price, Info Amount, and ReplySpeed in Model 1 are significant. The coefficient of regression for Rating is 3.198, indicating that reputation has a positive influence on sales. The more the service's reputation, the greater its sales. Assuming that H1 is supported, Pricing's coefficient of 0.086 implies that price has a positive influence on service sales. In the process of selling online medical consultation services, pricing is primarily an indicator of quality. If H2 support is assumed, InfoAmount has a factor of -0.247. The sales volume of the doctor's online

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consultation service decreases as the quantity of information in the doctor's response increases, however this finding does not support the hypothesis H3a. The coefficient of ReplySpeed is -0.550, indicating that the average response time for physicians is decreasing. The quicker the response time, the more online medical consultation services are sold. This result complies with H3b.

Using Model 2, the hypotheses H4a, H4b, H4c, and H4d were evaluated. Model 2 is derived from model 1 by including the degree of competition variable (Competitors) and its cross-terms with the primary independent variables of interest. Model 2's R2 is greater than model 1's R2, and model 2's log likelihood is also greater than model 1, indicating that adding Competitors improves the model's fit. In other words, the addition of cross terms improves the model's fit and validates the model. The predicted Competitors coefficient in Model 2 is -0.815, which is statistically significant at the 0.01 level. The sales volume of online medical consultation services for physicians has decreased due to competition, and the need for these services is restricted. The greater the number of competing service providers, the lower the sales of each rival. The positive coefficient of the cross-term Rating*Competitors explains the beneficial influence of market rivalry on reputation. Assuming that all H4a are supported. The positive coefficient of the cross-term Price*Competitors demonstrates the favourable influence of market rivalry on price growth. Assuming support for H4b. The cross-term InfoAmount*Competitors coefficients are considerably negative, but the cross-term ReplySpeed*Competitors coefficients are all significantly positive, demonstrating that rivalry diminishes the favourable impact of reply speed. H4c and H4d were supported, and the negative impact of informativeness was amplified. When competition is severe, customers are more likely to pick online medical consultation services based on quality signals such as reputation and price. This modification might diminish the quality of the information supplied in the consultation services that depend directly on evaluating doctors.

Using Model 3, the hypotheses H5a, H5b, H5c, and H5d were evaluated. Comparing the fitting findings of Model 1 and Model 3, it is discovered that illness risk (Risk) and its cross term improve the model's fit. The coefficient of Risk is notably negative, indicating that the volume of sales for high-risk illnesses is much lower than that for low-risk diseases. The coefficient of the cross-term Rating*Risk is positive, showing that when illness risk is high, the doctor's reputation influences the patient's service purchase choice more positively. The evidence supports hypothesis H5a. Assuming that H5b is unsupported, the coefficient of Price*Risk is not statistically significant, indicating that Risk has no moderating influence on the link between price and sales. InfoAmount*Competitors coefficients are considerably negative, but ReplySpeed*Competitors coefficients are significantly positive. The findings corroborate the hypotheses H5c and H5d, as the positive influence of service response time on patient purchase decisions decreases and the negative impact of large information volume on patient decision-making increases. When the danger of sickness is high, customers are more likely to depend on reputation as a quality signal when selecting a doctor's online consultation services, while the impact of the quality information expressed by the consulting services given by physicians is less.

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Table 5: Regression results of negative binomial regression

	Model 1	Model 2	Model 3
Rating	3.198***	2.818***	2.933
lnPrice	0.086***	0.051***	0.099***
ReplySpeed	-0.550***	-0.813***	-0.772***
lnInfoAmount	-0.247***	-0.043	-0.128***
Competitors		-0.815***	
Risk			-0.545***
Rating*Competitors		0.561***	
Price*Competitors		0.178***	
ReplySpeed*Competitors		0.700***	
InfoAmount*Competitors		-0.384***	
Rating*Risk			0.509***
Price*Risk			0.001
ReplySpeed*Risk			0.654***
InfoAmount*Risk			-0.291***
Log likelihood	-45795.6	-45331.2	-45513.3
Pseudo R^2	0.118	0.127	0.124

Note : *** p<0.01, ** p<0.05, *p<0.1

This research focused on the impact of conventional and virtual MCS on patients' decisions and physicians' participation in telemedicine marketplaces. On the basis of theories of signaling and self-determination, five research hypotheses and empirical models were constructed. Ten of twelve hypotheses are supported by our study model's findings. Consequently, this investigation presents three significant conclusions. First, we discovered that virtual MCS had a greater impact on patients' decisions than conventional MCS. Second, we discovered that virtual MCS had a greater impact on the contribution of physicians than conventional MCS. Thirdly, the empirical findings of this research demonstrated that virtual and conventional MCS have a substantial impact on the behaviours of patients and physicians.

DISCUSSION OF RESEARCH RESULTS

Prior research has shown that medical consulting services positively influence customer choices. Our research separated the benefits of conventional and virtual MCS feedback on patients' decisions. According to the signaling hypothesis, the cost determines the signal's power. Virtual MCS as a signal that represents the quality of physicians' services is more expensive than regular ones. In telemedicine marketplaces, conventional MCS from patients with service experience might be fabricated and so mislead patients who depend on these services. Virtual MCS lowers provider costs and decreases the chance of inaccurate data. Consequently, virtual MCS is more dependable and robust than conventional MCS for patients to evaluate service quality.

Reputation impacts sales positively. Reputation is the patient assessment gathered by physicians via long-term online and offline services for patients; it is an indication of quality

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derived from people' judgements of the quality of doctors' services. It is a lead with a broad reach that grows over time. It is more trustworthy and less susceptible to manipulation than low-range signals. Reputation is an external characteristic that is not a physical component of a product or service. Likewise, changes in it have no meaningful effect on the actual product or service, but they often influence customers' perceptions of quality. When intrinsic information is scarce, deemed useless, or cannot be processed, it is more likely that extrinsic cues will be used to assess product quality, resulting in a more heuristic quality assessment. Reputation, as a significant indicator of the quality of online medical consultation services provided by physicians, is an essential reference signal for patients when buying services. A favourable reputation may increase a doctor's popularity and revenue.

The relationship between price and sales volume is positive, and the price has a favourable effect on sales volume. In online medical consultation services, pricing is the primary indicator of quality for patients. Prices increase, while physicians' earnings per service increase. The overall revenue of physicians grows with the price. The price is in the low range, and the doctor is free to adjust it at any moment. It is less reliable as a quality signal compared to a signal with a greater range. Due to the credibility of online medical consultation services, however, there is a significant information asymmetry between doctors and patients regarding the quality of online medical consultation services, and the price can still communicate its quality signal to doctors and be adopted by patients.

The quantity of information in online medical consultation services offered by physicians has a negative correlation with sales, but a positive correlation with sales. Online consultations are conducted by patients to get disease-related information. Patients are irreplaceably attracted to the quantity of information, yet it has a negative correlation with sales. This may be attributable to the expensive expense of mining information on physicians' services, particularly for people who have never received medical care. These will be elaborated upon in future chapters.

The speed of service response correlates favourably with sales and revenue. Service waiting time is one of the most significant measures of service quality perception. The more quickly information is supplied, the sooner it is used. The greater the information usage rate, the greater the timeliness. Uncertainty over the security of one's life diminishes a patient's happiness while he or she is unwell. However, timely information services may minimize patients' confusion over their sickness, enhance their feeling of security, and boost patient satisfaction, therefore encouraging patients to buy services.

Competition diminishes the influence of information volume and service speed on sales, hence boosting the impact of price quality and reputation signals. The quantity of information offered by physicians and the promptness of services compel people to independently sift through information previously provided by doctors. Price and reputation signals are easily available. When competition is fiercer, i.e., while a bigger number of physicians give consultation services for the same patient, patients must analyze a higher quantity of information when selecting services. Patients have limited time and energy, and they prefer to choose easy treatment procedures based on price, reputation, and other quality indicators.

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CONCLUSIONS

Virtual MCS is a unique technique in consultation health care services that may assist people in evaluating the quality of service given by physicians and increase doctors' market share in telemedicine. Although several studies have been undertaken on the effects of service feedback on patient behaviour, little study has been conducted on the function and effectiveness of conventional and virtual from the patients' and physicians' viewpoints. To address this gap in the literature, we created a 2-equation panel model based on the theories of signaling and self-determination and tested our assumptions using telemedicine market data. In accordance with the empirical findings of our study, virtual MCS has a greater impact on patient choices and physician participation than conventional systems. In addition, we discovered that virtual MCS may replace conventional MCS in telemedicine markets. Therefore, virtual platforms may serve as an indispensable resource for both patients and physicians. Our results may add to existing or future relevant research in the medical consultation service industry and give guidance for market designers and developers.

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