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# *INTERNATIONAL JOURNAL OF SCIENCE ARTS AND COMMERCE*

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## **A STUDY OF PATIENT SATISFACTION BASED ON GENERAL HOSPITALS IN TAIZHOU, ZHEJIANG PROVINCE, CHINA**

BY

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### **Abstract**

*In recent years, with the vigorous promotion of the Chinese government, China's telemedicine has achieved rapid growth and development. However, due to its late start, there are still some problems in its development, such as the technical standards are not unified, the service process is not perfect, the operation mode is not perfect, and the service mode is single. These service quality problems significantly affect patient satisfaction and behavioural intention. At present, there is a lack of relevant research on the quality of telemedicine service in China. Therefore, it is of great significance to study the relationship among quality of telemedicine service, performed value, patient satisfaction and behavioural intention, and the role of patient participation to effectively improve quality of telemedicine service, pay attention to the role of patient participation and improve patient satisfaction and patient behavioural intention. In this study, from the perspective of patient perception, we first constructed a theoretical model with perceived value and patient satisfaction as the intermediate variables based on the relevant literature. The quality of telemedicine service directly impacts behavioural intention, and patient participation has a regulatory effect on the quality of telemedicine service and patient satisfaction. Secondly, the corresponding scale and questionnaire were designed. Taking Zhejiang telemedicine centre as the platform, the patients who had received telemedicine consultation as the survey objects. The reliability and validity of the collected questionnaire data were analyzed by AMOS 21.0 and SPSS 21.0 software, and the analysis of variance, structural model analysis and regression analysis were conducted. Finally, it summarizes and analyzes the research results, puts forward suggestions to improve patient satisfaction and behavioural intention, and points out the shortcomings and prospects of the research. The results are as*

*follows: (1) quality of telecommunication service includes five dimensions: tangibility, reliability, assurance, responsibility and emergency; (2) patients with different age, education and distance have significant differences in the perception of each variable; (3) the influence of each dimension of quality of telemedicine service on patient satisfaction, performed value and patient behavioural intention is quite different. Based on the above conclusions, this study puts forward the following suggestions for the sustainable development of telemedicine service: firstly, priority should be considered when improving the quality of telemedicine service; Secondly, we should carry out market segmentation and establish differentiated marketing strategy; Finally, we should pay attention to the role of performed value and patient participation.*

**Key words:** Quality of telemedicine service; Perceived value; Patient satisfaction; Behavioural intention; Patient participation

## INTRODUCTION

### Background of Study

Health is the foundation of the people and the country. The state has always attached great importance to people's health and made significant decisions and arrangements. Since the new medical reform was launched in 2009, the state has integrated health and health workers into the overall strategic height of national economic and social development. With the innovation and development of new information technology, we should pay attention to the health medical information industry as an important content of health and health resources allocation, and fully use new technology tools to accelerate the construction of medical and health information to help the reform comprehensively deepen and ensure the health of all people with higher quality. The CPC Central Committee and the State Council issued the "opinions on deepening the reform of the medical and health system" (2009), which regards health informatization as one of the four pillars of the reform and clarifies that health informatization is the main support of the reform. The notice of the general office of the State Council on Printing and distributing the planning outline of the national medical and health service system (2015-2020) (2015) explicitly includes the information industry allocation into the overall layout of the national medical and health service system for the first time. It is listed as four major layout elements: the institutional setting, bed allocation, and other resource allocation (equipment allocation and technology allocation). The "made in China 2025" (2015) issued by the State Council has listed medical and health information technology innovation as a priority direction and key field.

China's health service is a socialist public welfare service with certain welfare. The development level of health service is directly related to the people's health level and the prosperity of the Chinese nation. Therefore, health service plays an important role in public service. Since the founding of the people's Republic of China, especially since the reform and opening up, China has attached great importance to the development of health services. The state's investment in

health services has been increasing year by year. The overall level of medical technology has been continuously improved, and the national health situation has been greatly improved.

Hospital is the core element of China's health cause, and it is an organization engaged in the diagnosis and treatment of diseases and other medical services formed in the process of human fighting against diseases. Modern hospitals take "quality first, safety first" as the service principle. Medical quality is the key to the survival and development of hospitals in the fierce market competition. Therefore, non-profit hospitals and profit-making hospitals will integrate all human and material resources to make unremitting efforts to improve the medical quality comprehensively.

Patient satisfaction is one of the most important indicators to measure the quality of medical service. The hospital should constantly enhance the awareness of serving patients, fully understand the different levels of needs of patients, carry out humanized, scientific, whole process, high-level medical services, meet the different needs of patients, and improve patients' satisfaction. Patient satisfaction is the patient's overall evaluation of medical services after receiving medical services. To a certain extent, it reflects the level of hospital quality of medical service, and quality of medical service is the manifestation of the comprehensive strength of hospital personnel in terms of technical level, management level and service conditions. Therefore, in order to improve the satisfaction of patients, hospitals should constantly improve their comprehensive strength, strengthen the investment in personnel training, and improve the technical level of health technical personnel; Learn the new methods and concepts of advanced hospital management at home and abroad to improve the management level; Improve the service environment, improve the condition of diagnosis and treatment.

### **Problem Statement**

In recent years, although domestic research on patient satisfaction has made some progress, it is still in the process of exploration both in theory and practice, and there are still many problems to be further studied, mainly in the following aspects:

1. There is no unified patient satisfaction measurement tool, and the choice of evaluation index needs to be discussed. The foreign patient satisfaction survey scale can not be simply transplanted to China. However, no scientific and effective patient satisfaction survey scale can be popularized and used in China so far, and the evaluation index also goes its way, which lacks scientificity and reliability. As a result, the patient satisfaction assessment results between regions and hospitals can not be used as the basis for comparison, nor can they be used as the basis for the unified assessment and evaluation of the national medical structure by the health authorities.

One of the reasons is the lack of scientific measurement tools and development strategies. Most

of the scales used are self-designed. Questionnaire design, survey methods, and statistical processing are highly subjective and lack objective decision-making procedures for index screening. Due to the lack of authoritative standardized measurement tools suitable for China's national conditions and the characteristics of the medical system, most of the patient satisfaction surveys are mainly organized by the hospitals themselves, which are random and lack of application of statistical means to verify, leading to the subjectivity of the evaluation index; Secondly, the questionnaire research lacks applicability and practicability, and most of the existing satisfaction evaluation scales are not universal and representative, which makes the evaluation results lack comparability and objectivity; Thirdly, the index system of patient satisfaction scale does not fully reflect the internal structure of patient satisfaction index model. At present, the content of patient satisfaction scale in China is mostly related to medical quality, medical staff's service attitude, medical environment and so on, but most of the important contents of patients' expectation, value perception, loyalty and so on are not involved. The evaluation results obtained in this way are difficult to provide a scientific and effective basis for the choice of medical institutions. Feng Yuechuan et al. (2011) pointed out that the scientificity, acceptability and reliability of the existing patient satisfaction questionnaire need to be further revised and improved, which is an urgent issue for all hospitals.

2. There is no unified patient satisfaction index model, and the evaluation method needs to be improved. The evaluation of patient satisfaction in China started late. Although some scholars have studied the index model and evaluation method of patient satisfaction, these models still need much empirical analysis to verify. There is no unified patient satisfaction index model in China, and there is no report about patient satisfaction index modelling and evaluation, parameter estimation, etc.

## **Research Questions**

This research focuses on the design of the patient satisfaction survey scale, the formation of patient satisfaction evaluation index system, the construction of patient satisfaction index model and the evaluation method of patient satisfaction index:

1. This paper summarizes the research background and significance of this dissertation; This paper reviews the domestic and foreign literature on the concept and theory of customer satisfaction, customer satisfaction theoretical model, customer satisfaction index model, patient satisfaction, patient satisfaction index model, patient satisfaction evaluation method and questionnaire design; This paper analyzes the main problems existing in the evaluation of patient satisfaction in China and their causes.

2. The basic principles of patient satisfaction scale design were introduced; The determination and test methods of scale factors and indicators were summarized; The general process of developing patient satisfaction scale and determining evaluation index is given.

3. This paper systematically analyzes various methods and characteristics of subjective and objective weighting methods; This paper summarizes the general steps of the comprehensive evaluation of patient satisfaction and the methods of screening evaluation indexes; Finally, the comprehensive index method used in patient satisfaction evaluation is introduced.

### **Research Objectives**

Considering that China's current medical and health system is different from that of European and American countries, outpatient diagnosis and treatment in large general hospitals is still the starting link of most patients' medical treatment process in China. The experience and feeling of outpatient link can easily make patients form a basic understanding of whether the whole hospital is satisfied or not and affect the hospital's reputation and image through word of mouth. The research on patient satisfaction in China has mostly focused on the measurement and analysis of patient satisfaction in residential (out of hospital) hospitals. On the one hand, it is difficult to set up sampling survey nodes due to the relatively short outpatient visit time; On the other hand, it is relatively easier to obtain the patient satisfaction scale for large-scale general hospitals due to the different national conditions in foreign countries. At the same time, considering the space limitation, the elaboration of this dissertation focuses on the evaluation of patient satisfaction in the outpatient department of the large general hospital, trying to provide an idea of patient satisfaction modelling. The main research objectives are: based on customer satisfaction and patient satisfaction theories and evaluation methods at home and abroad, using scientific methods to improve patient satisfaction evaluation tools, optimize patient satisfaction scale indicators and innovate evaluation methods in large general hospitals; Through the construction of patient satisfaction index model, we can create a more scientific and reasonable evaluation index system of patient satisfaction in large general hospitals, and provide help for the formulation of quality improvement measures and service development strategies in large general hospitals.

## **LITERATURE REVIEW**

### **Patient Satisfaction**

With the rise of the new public management theory, public service departments began to introduce market operation mechanisms into the public health industry, resulting in patient satisfaction. As for patient satisfaction, scholars also put forward the concept of patient satisfaction based on the concept of customer satisfaction and the characteristics of medical services. The representative views are shown in the table.

**Table 2-1 Concept of patient satisfaction**

Scholar	Definition of patient satisfaction
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Risser (1975)	The consistency degree of patients' ideal medical service and perceived medical service
Pascore (1983)	People's evaluation of whether the medical services they have experienced can meet their own medical needs.
Woodside (1989)	After the event, people express whether they like the medical service they have experienced or not.
Singh (1990)	A multi-dimensional evaluation of medical services received by patients under specific circumstances.
Dozier (2001)	The comparison between patients' perceived medical service and their expected service.
Keegan et al. (2003)	The comprehensive attitude of patients towards perceived medical services includes cognitive and emotional aspects.
Feng wen (1996)	The patient's experience and subjective feeling of medical service.
Wang Minyi (2004)	The comprehensive evaluation of patients' expectations of medical service and their perceived service to meet the health and improve the quality of life.
Qian yu (2015)	In a relatively rational cognitive level and environment, people have a certain expectation of medical services to meet disease and prevention requirements and their rational evaluation after perception.

Source: Author

Based on the above literature review, it can be found that although scholars have different statements on patient satisfaction, they all emphasize that patient satisfaction is a comparison between expectation and actual perception, which is an evaluation of medical services. It can be seen that the concept of patient satisfaction has three characteristics. One is subjectivity. Patient satisfaction is people's subjective evaluation of their feelings about medical services related to their own health, experience, income level, and other personal characteristics. The second is the hierarchy. According to Maslow's hierarchy of needs theory, patients at different needs have different evaluation criteria for medical services. Therefore, patients at different levels of needs may have different evaluation criteria for the same services. Third, relativity. Because patients are not familiar with objective medical indicators, they often compare their services with other similar services or previous experience to get satisfaction evaluation.

Under telemedicine service, because of its late development, people know little about it. After receiving its services, patients often compare with the traditional medical services they receive, thus forming the satisfaction evaluation of telemedicine services. Therefore, the author defines patient satisfaction as the patient's subjective feelings after receiving telemedicine service, a comprehensive comparison of expectation and perception.

### **Previous research**

The concept of patient satisfaction is derived from the concept of customer satisfaction. From a commercial point of view, patient satisfaction in medical services has many similarities with customer satisfaction in any other products and services in methodology and has also experienced a process from simple scoring evaluation to comprehensive evaluation by using index model. However, the medical service industry has its particularity. The concept of the consumer can not be introduced directly from the field of economics to the field of medical service. From the sociological point of view, the service orientation of doctors and their special knowledge system, power and prestige make it difficult for patients' views to be compatible with those of medical experts. There are some differences between the theory and method of patient satisfaction and the general industry customer satisfaction

### **Telemedicine Service**

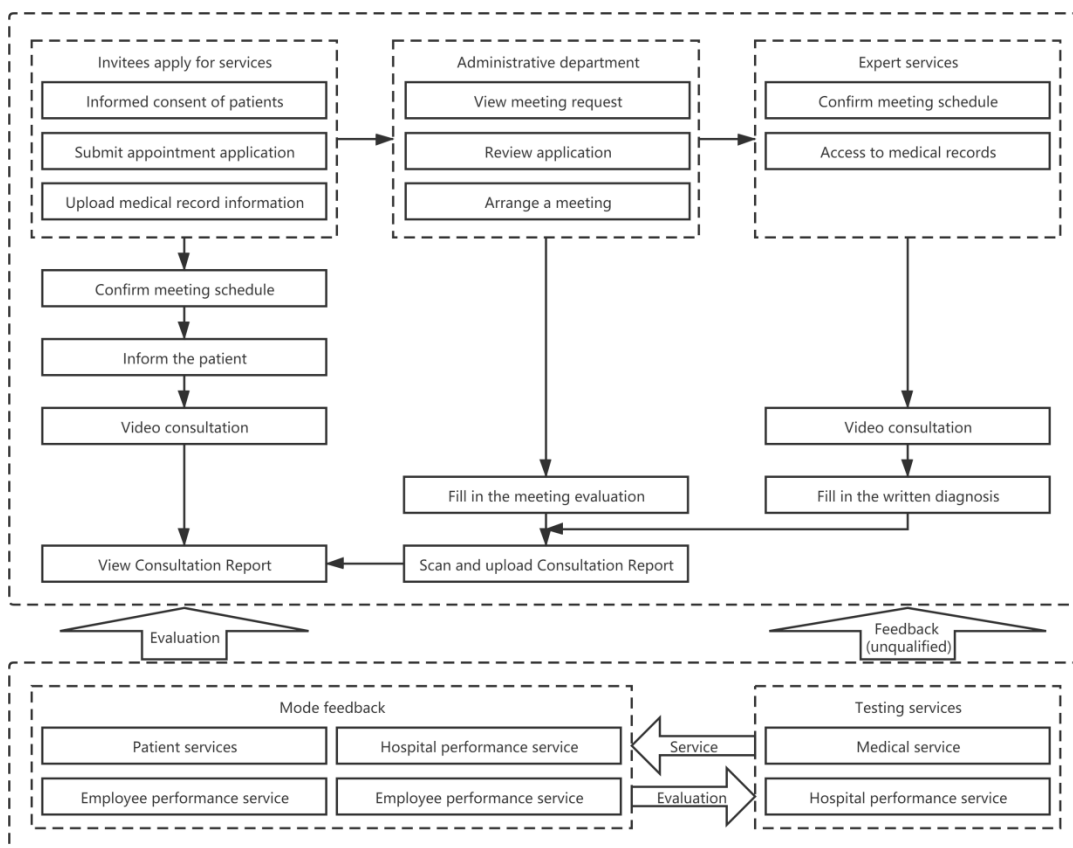
Telemedicine service refers to remote communication, computer multimedia technology and mobile Internet technology to collect, transmit, process, store and query all kinds of medical information to realize the examination and diagnosis of remote patients, implement medical monitoring, carry out medical education and convey disease information. From the concept of telemedicine, telemedicine service is very different from the traditional face-to-face diagnosis and treatment mode, mainly in the following aspects: (1) remote medical service is realized by using modern communication, that is, patients and doctors are not in the same space; (2) Telemedicine service participants include patients, applicants and invitees, which makes the service more complex.

Based on the above analysis, the author summarizes the unique characteristics of telemedicine service as follows:

First, networking. Telemedicine is mainly realized using modern communication technology and multimedia technology, so it has the nature of the network. On the one hand, it can realize resource sharing and bring convenience to patients and primary hospitals; On the other hand, it will bring more uncertain factors to the service.

Second, risk. Telemedicine service involves more members, and with the participation of the network, the remote doctors can not feel the patient's situation, which will increase the

probability of misdiagnosis. The main performance is as follows: 1) in terms of operation and transmission and the instability of the system and equipment, the operator's error will also increase the risk. 2) In terms of consultation information, under telemedicine service, the consultant mainly relies on the information provided by the applicant to judge. If the information is not comprehensive or the information provided is wrong, the result may be wrong. 3) Due to the equipment condition of the applicant can not meet the requirements, the patient's actual condition can not be detected, which will lead to the consultation doctor unable to make a correct judgment. 4) Under telemedicine service, the level of the consultant plays an important role. 5) The degree of understanding of the scheme proposed by the consultant will also affect the medical results.



Scholars generally define the quality of medical service from the perspective of medical service providers and recipients. From the perspective of medical service providers, quality of medical service is the ability to use its medical resources to meet the medical needs of patients. It can be measured by objective indicators such as coincidence rate, misdiagnosis rate, cure and improvement rate of initial clinical diagnosis and clinical diagnosis. From the perspective of medical recipients, the scope of quality of medical service is wider. It includes the treatment results and pays more attention to the perceived gap between the actual medical service and the



expectation of patients. Due to the development of the "consumer-centred" concept, scholars prefer to study the quality of medical service from the perspective of demand.

Based on the above analysis, this study defined quality of telemedicine service as the difference between patients' expectation and actual perception of telemedicine service from the perspective of patients' perception. Based on this definition, telemedicine service should have two aspects: one is the resulting quality, including the safety and effectiveness of the treatment results, and the other is the subjective quality, including the comfort of the medical environment, the timeliness of medical services, and the rationality of waiting time.

## **METHODOLOGY**

### **Research Design**

Since 1980, service quality has been widely concerned and studied by scholars. Relevant studies at home and abroad have shown a significant causal relationship among service quality, perceived value, customer satisfaction and behavioural intention, but scholars have different opinions on how to affect it, and no unified conclusion has been reached. Under telemedicine service, the relationship between the four needs to be verified by empirical analysis.

Patient satisfaction is from three aspects, but it is considered a whole, so there is no specific dimension division. The dependent variable behavioural intention is also analyzed from three perspectives but also measured as a whole. In addition, the author tries to analyze the modelling effect of patient participation as a holistic concept.

### **Population, Sampling, and Unit of Analysis**

The main body of the questionnaire includes three parts. The first part is the first part of the volume, which mainly describes the research topic, purpose and confidentiality commitment of the questionnaire to help the respondents understand the significance of the survey and ensure that they fill in the questionnaire according to their real ideas. The second part is the basic information of the respondents, including gender, age, registered residence, education, income sources, hospitals and so on. The third part is the main part of the questionnaire, including 35 items in table 4-1. All the items in this part use declarative sentences, and the interviewees are required to score according to their own feelings, with 1-5 points from very disagree to very agree.

### **Instrumentation**

The variables involved in this study are telemedicine service quality, perceived value, patient satisfaction, behavioural intention and patient participation. Among them, telemedicine service quality is divided into five dimensions: tangibility, reliability, assurance, responsiveness and

empathy. In order to improve the rationality and feasibility of the questionnaire and ensure the reliability and validity of the scale, this study revised the scale based on the literature review, referring to the existing mature scales, combined with the characteristics of telemedicine service and the key influencing factors of telemedicine service quality, and designed the specific contents of each variable through expert interviews.

### Validity and Reliability Test

In order to ensure the reliability of the measurement scale, this study adopted Cronbach's  $\alpha$  coefficient and corrected the total correlation coefficient (Corrected Item-TotalCorrection, CICT) to test the reliability of the questionnaire. If the CICT of a certain item is less than 0.5, remove the item; otherwise, keep it. At the same time, if the Cronbach's  $\alpha$  value of each item after deletion is less than the overall Cronbach's  $\alpha$  value of the dimension where the item is located, the item must also be deleted. If Cronbach's  $\alpha$  of all dimensions should be greater than 0.7, the entire questionnaire design is acceptable.

In this study, SPSS21.0 was used to calculate the CICT and Cronbach's  $\alpha$  of each dimension, and the results are shown in Table 3-2. The CICT of all items is greater than 0.5, and the Cronbach's  $\alpha$  of each dimension is greater than 0.7, so the questionnaire design is reliable.

**Table 3-2 Reliability analysis of pre questionnaire**

Vari.	Code	CICT	Cronbach's $\alpha$ / Del.	Cronbach's $\alpha$
Tangibility	T1	753	806	0.862
	T2	704	827	
	T3	650	848	
	T4	737	813	
Reliability	Rel1	752	809	0.863
	Rel2	731	818	
	Rel3	693	833	
	Rel4	673	841	
Assurance	A1	729	746	0.827
	A2	579	814	
	A3	641	788	
	A4	669	775	
Responsiveness	Res1	640	776	0.820
	Res2	683	754	
	Res3	679	756	
	Res4	571	806	
Empathy	Eml	652	792	0.832
	Em2	690	774	

	Em3	659	789	
	Em4	644	794	
Patient satisfaction	PSI	528	723	0.751
	PS2	635	599	
	PS3	576	671	
Perceived value	PV1	714	849	0.876
	PV2	734	841	
	PV3	724	845	
	PV4	761	829	
Behavioural intention	BI1	564	753	0.789
	BI2	643	714	
	BI3	567	755	
	BI4	620	726	
Patient participation	PPI	625	840	0.852
	PP2	701	812	
	PP3	763	785	
	PP4	704	808	

Source: Author

Exploratory factor analysis (EFA) is carried out under the condition of the uncertainty of scale dimensions. By extracting the same features, similar factors are classified to simplify the number of related influencing factors and simplify the complexity. Although the telemedicine service quality scale in this study is based on the existing mature scale, combined with its characteristics, and formed through expert interviews and tutor communication, it still lacks empirical research. Therefore, it is necessary to use exploratory factor analysis to verify the rationality and feasibility of the scale design. The other variables involved in the study are analyzed by one dimension and refer to the mature scale design. Exploratory factor analysis is no longer carried out here.

By factor analysis, Zhang Wentong thinks that the sample size should be more than 100, which is in line with the sample size requirements. Before extracting factors, we should first check the KMO value and Bartlett's sphericity test. Generally speaking, when KMO is more significant than 0.7, it is acceptable; Less than 0.5 is not suitable for factor analysis. At the same time, Bartlett's spherical test p-value should be less than 0.05 before factor analysis. The quality of telemedicine service includes 20 items. Principal component analysis and maximum variance method are used for factor analysis. The results are shown in Table 3.3. The KMO value of the sample is 0.870, and the p-value of Bartlett's spherical test is less than 0.05, which can be used for factor analysis.

Questionnaire reliability analysis is an important index to test the validity of the questionnaire. In

this reliability analysis, the Cronbach coefficient is used to analyze the reliability of each variable and each sub variable. The results are shown in table 3-3.

It can be seen from Table 3.3 that the Cronbach coefficients of the five dimensions of quality of telemedicine service are greater than 0.8, and the structural reliability of the quality of medical service is 0.895, which indicates that the measurement items of quality of telemedicine service have good reliability. Secondly, the Cronbach coefficients of performed value, patient satisfaction, behavioural intention and patient participation were more significant than 0.7. In general, the scale is highly effective.

**Table 3-3 Analysis of the overall reliability of the questionnaire**

Vari.	Item	Cronbach's $\alpha$	Construct reliability
Quality of Telemedicine Service	Tangibility	No. 1—No. 4	0.804
	Reliability	No. 5—No. 8	0.807
	Assurance	No. 9—No. 12	0.835
	Responsiveness	No. 13—No. 16	0.820
	Empathy	No. 17—No. 20	0.827
Patient Participation	No. 21—No. 24	0.808	0.808
Perceived Value	No. 25—No. 28	0.865	0.865
Patient Satisfaction	No. 29—No. 31	0.752	0.752
Behavioural Intention	No. 32—No. 35	0.810	0.810

Source: Author

### Data Collection Process

First, based on the existing mature scale, the questionnaire is formed based on the characteristics of telemedicine service, expert interview and tutor communication; Secondly, the questionnaire was revised to form the final questionnaire according to the results of the small scale questionnaire to ensure the validity and reliability of the questionnaire; Finally, we carry out large-scale investigation and research. The Internet conducted this survey by way of an electronic questionnaire conducted on the Zhejiang telemedicine centre platform, and the subjects were patients who received the remote consultation service provided by the Zhejiang telemedicine centre.

## FINDINGS AND DISCUSSIONS

### Profile of Respondents

Descriptive statistical analysis of the basic information of the respondents, the results are shown

in Table 4-1. The distance between the patient's Hospital and Zhejiang telemedicine centre in the table is calculated by the author according to the patient's hospital using Google map and rounded, and it is divided into four stages according to the results.

It can be seen from table 4.1 that women account for 42% and men account for 58%, which is in line with reality. In terms of age, the proportion of people over 60 is the largest, accounting for 25%. With the decrease of age, the proportion decreases in turn. On the whole, people over 40 accounts for 68.7%, which is consistent with the structure of medical groups. It also shows that telemedicine has a wide audience, including middle-aged, elderly and young people.

Registered residence, registered residence accounts for 55.3%, higher than city household registration; In terms of educational background, the interviewees are mainly of medium and low educational level, which is in line with the reality; In terms of income sources, the fixed-wage group was the largest, accounting for 26.7%, followed by the individual income group, accounting for 26.4%; In terms of the distance from the hospital to the telemedicine centre of Zhejiang Province, the number of patients between 101-200 km was the most, accounting for 45.3%, followed by 201-300 km, less than 100 km and 301-400 km, which was basically in line with the distance from the provincial capital cities of various regions in our province. Regarding the number of consultation rooms, the study found that 63.9% of the respondents' hospitals had one consultation room, which fully reflected the lack of telemedicine equipment in primary medical institutions.

**Table 4-1 Descriptive statistics of samples**

Sample characteristics	Characteristic value	Number samples	ofProportion (%)
Gender	Female	156	42.0
	Male	215	58.0
Age	Under 30	47	12.7
	30-39	69	18.6
	40-49	73	19.7
	50-59	89	24.0
	60 and above	93	25.0
Household register	Countryside	205	55.3
	Town	166	44.7
Education	Primary school and below	88	23.7
	Junior middle school	90	24.3
	Senior high school and above	83	22.4
	Junior college	51	13.7
	Bachelor degree or above	59	15.9

Source of income	Fixed wage	99	26.7
	Personal operating income	98	26.4
	Child support	47	12.7
	Support from parents	22	5.9
	Pension	35	9.4
	Other	70	1&9
Distance between the hospital and Zhejiang remote centre (km)	Below 100	76	20.5
	101-200	168	45.3
	201-300	88	23.7
	301-400	39	10.5
Number of consultation rooms in the hospital	1	237	63.9
	2	46	12.4
	3	42	11.3
	4	46	12.4

Source: Author

### Measurement model verification of the quality of telecommunication service

Because the quality of telemedicine service includes five dimensions, and several items reflect each dimension, it should be verified by first-order and second-order models, respectively.

#### (1) First order verification of the quality of telemedicine service

For the first-order verification of the quality of telemedicine service, the following steps are adopted: firstly, the measurement models between tangibility, reliability, assurance, responsibility, empathy and their observed variables are constructed, respectively, and the operation results are shown in table 4-3.

From the fitting index results of each model in table 4-3, except the RMSEA values of reliability and empathy are slightly greater than 0.08, the fitting indexes of other measurement models are in line with the standard, indicating that the fitting conditions of each model are in line with the research needs.

**Table 4-3 Model fitting index results**

Fit indices	x2/df	GFI	AGFI	RMR	RMSEA	CFI	NFI
Tangibility	1.638	994	971	010	049	996	990
Reliability	2.897	989	945	014	084	989	983

Assurance	523	998	990	006	000	1.000	998
Responsiveness	724	997	986	006	000	1.000	996
Empathy	2.874	990	948	012	085	990	985
Quality of telemedicine service	1.333	930	908	023	035	976	911

Source: Author

According to the results of convergence validity of each dimension of quality of telecommunication service in table 4-4, the standardized factor load of each observation variable was distributed between 0.624-0.853, all above 0.5; The Cr and ave of the five variables were greater than 0.8 and 0.5 respectively, which indicated that the quality of telemedicine service had good convergent validity.

**Table 4-4 Convergence validity of quality of telemedicine service**

	Unstd.	S.E	C.R.	P	Std.	CR	AVE
T1	<— Tangibility	1.000			739		
T2	<— Tangibility	887	097	9.117	*** 633	806	511
T3	<— Tangibility	972	097	10.040	*** 709		
T4	<— Tangibility	1.039	098	10.561	*** 770		
Rel1	<— Reliability	1.000			720		
Rel2	<— Reliability	1.145	113	10.147	*** 749	831	512
Rel3	<— Reliability	1.029	105	9.778	*** 707		
Rel4	<— Reliability	925	097	9.534	*** 684		
A1	<— Assurance	1.000			853		
A2	<— Assurance	779	064	12.180	*** 722	807	567
A3	<— Assurance	647	063	10.299	*** 624		
A4	<— Assurance	932	070	13.354	*** 794		
Res1	<— Responsiveness	1.000			749		
Res2	<— Responsiveness	973	093	10.419	*** 716	820	533
Res3	<— Responsiveness	916	090	10.153	*** 695		
Res4	<— Responsiveness	1.071	099	10.865	*** 758		
Eml	<— Empathy	1.000			811		
Em2	<— Empathy	807	076	10.659	*** 671	829	549

Em3	<—	Empathy	764	072	10.637	***	670
Em4	<—	Empathy	997	080	12.422	***	799

Note: \* \*, P < 0.001.

Source: Author

### Test of measurement models of performed value, patient satisfaction, the behavioural intention with patient participation

This paper builds the measurement models of performed value, patient satisfaction, behavioural intention, and patient participation to verify the relationship between them and their observed variables. The model fitting indexes are shown in Table 4-9.

It can be seen from table 4-8 that the RMSEA fitting value of the performed value measurement model is not ideal, but because this model is a simple measurement model with four items, the author thinks that its performed value model meets the research requirements. Patient satisfaction individual fitting index has no result because the latent variable contains three items, forming a saturation model, the fitting effect is very good. Each fitting index of the measurement model of behavioural intention and patient participation meets the requirements.

**Table 4-8 Fitting results of the measurement model**

Fit indices	x <sup>2</sup> /df	GFI	AGFI	RMR	RMSEA	CFI	NFI
Perceived value	2.663	980	900	014	131	981	978
Patient satisfaction	—	1	—	0	—	1	1
Behavioural intention	1.275	995	977	008	032	998	993
Patient participation	2.090	992	960	010	064	993	988

Source: Author

According to the analysis of the convergence validity test in table 4-9, the standardized factor load of each observation variable is between 0.654-0.829, all above 0.5. CR of each latent variable was above 0.7, and AVE was above 0.5. The results show that the four variables, namely, performed value, patient satisfaction, behavioural intention and patient participation, have high convergence validity with their respective observed variables.

**Table 4-9 Convergence validity of performed value, patient satisfaction, behavioural identity and patient participation**

Unstd.			S.E	C.R.	P	Std.	CR	AVE
PV1	<—	Perceived	1.000			799	865	617
PV2	<—	Perceived	912	072	12.653	***	756	
PV3	<—	Perceived	919	073	12.628	***	755	



PV4	<—	Perceived	1.051	076	13.863	***	829		
PS1	<—	Patient	981	069	12.856	***	691	754	505
PS2	<—	Patient	1.146	138	319	***	694		
PS3	<—	Patient	1.171	141	292	***	746		
BI1	<—	Behavioural	1.000				728	811	519
BI2	<—	Behavioural	1.036	102	10.189	***	726		
BI3	<—	Behavioural	944	101	9.358	***	654		
BI4	<—	Behavioural	1.116	106	10.547	***	768		
PP1	<—	Patient	1.000				679	809	514
PP2	<—	Patient	1.222	128	9.555	***	727		
PP3	<—	Patient	1.143	118	9.666	***	741		
PP4	<—	Patient	1.200	126	9.499	***	720		

Note: \* \*, P < 0.001.

Source: Author

**One-way ANOVA of other demographic variables to factors**

In this study, age, education background, income source and distance were used as grouping variables to analyze whether patients with different demographic characteristics had significant differences in perception of each factor.

The homogeneity test results of variance are shown in table 4-14. Other results showed homogeneity of variance (SIG. Are greater than 0.05) except for the age to reliability factor and education to assurance factor. However, because the ratio of the maximum variance to the minimum variance is less than 3, the interference degree to the results is weak, so it can not be considered so that it can be further analyzed.

**Table 4-14 Homogeneity test of variance of age, education background, income source and distance**

	Age		Education		Source of income		Distance	
	Levene statistics	Sig.	Levene statistics	Sig.	Levene statistics	Sig.	Levene statistics	Sig.
Tangibility	762	551	364	834	374	866	1.728	161
Reliability	3.038	018	1.312	266	1.635	151	152	928
Assurance	739	566	2.579	038	436	823	350	789
Responsiveness	769	546	949	436	1.596	161	1.375	251
Empathy	390	816	523	719	1.596	161	2.620	051

Patient	390	816 523	719 1.596	161 2.620	051
Patient	1.218	303 616	651 1.015	409 961	411
Perceived value	1.351	251 941	440 1.521	183 212	888
Behavioural	1.981	098 744	563 2.121	063 576	631

Source: Author

It can be seen from table 4-15 that due to different ages, there are significant differences in assurance, value perception and behavioural intention perception among patients receiving remote consultation service (SIG. Are all less than 0.05); Due to the different educational background, there were significant differences in tangibility, reliability, responsibility and performed value (SIG. All less than 0.05); According to the source of income, there were significant differences in the quality of telemedicine service's assurance perception factor (SIG. All less than 0.05); However, due to the different distance between the patient's Hospital and Zhejiang telemedicine centre, there were significant differences in the reliability, satisfaction and the factor of performed value (SIG. Were less than 0.05). According to these differences, multiple comparisons were used for further analysis.

**Table 4-15 One way ANOVA of age, education background, income source and distance**

	Age		Education		Source of income		Distance	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.
Tangibility	1.651	162	2.575	038	1.574	168	665	574
Reliability	2.099	081	5.314	000	914	472	5.105	002
Assurance	2.752	029	2.129	078	2.426	036	2.212	087
Responsivene	2.168	073	3.202	014	1.399	225	1.782	151
Empathy	447	775	1.992	096	893	486	607	611
Patient	447	775	1.992	096	893	486	607	611
Patient	2.201	069	1.950	103	600	700	2.827	039
Perceived	3.311	011	2.703	031	2.234	051	3.809	011
Behavioural	3.724	006	1.948	103	1.907	093	1.876	134

Source: Author

## CONCLUSION

This study analyzes the internal mechanism among quality of telephone service, performed value, patient satisfaction, patient participation and behavioural intention in the context of telecommunication service, designs the theoretical research model of this separation, and makes corresponding assumptions through literature review and summary.

From the perspective of patient segmentation, affected by age, educational background, and the distance between the patient's Hospital and Zhejiang telemedicine centre, patients' perception of each dimension of quality of telemedicine service, perceived value, patient satisfaction, patient participation and behavioural intention factors are quite different. For different types of patients, telemedicine service providers should be reasonably positioned to meet their differentiated needs.

From the empirical analysis results, we can see that each factor of quality of telemedicine service has a great difference in performed value, patient satisfaction and behavioural intention. At the same time, the quality of telemedicine service affects the degree and size of patients' behavioural intention through performed value and patient satisfaction. On the whole, assurance and reliability play the most important role, followed by tangibility, empathy and finally, responsibility. Therefore, telemedicine managers can focus on the importance order of the above dimensions to strengthen the quality of telemedicine service and obtain the maximum output with the minimum input.

To improve the assurance and reliability of the quality of telemedicine service, we can start from the following four points. ① Ensure the stability of the system. Choose the technology manufacturer with a good reputation; Establish and improve the constraint mechanism, incentive mechanism and responsibility mechanism of telemedicine service equipment and operation network providers; At the same time, the local administrative, regulatory agencies should also introduce relevant supporting policies to ensure information security and information integrity. ② Patient informed consent. Doctors should fully inform telemedicine related information; Knowledge sharing platform should be established to reduce patients' insecurity. ③ Reduce the non-technical risk in the service process. Strengthen the skill training for doctors, relevant staff and technicians, strengthen the medical operation level of consulting doctors, and improve the technical safety and stability of operators; Strengthen the communication and learning between the inviting party and the invited party, improve the medical care level of the inviting party and the ability of communication and coordination with each other; Establish perfect and scientific rules and regulations to avoid the risks of various uncontrollable factors in the process of telemedicine service; ④ Improve the enthusiasm of doctors, establish reward and punishment mechanism, establish perfect process specification and optimize telemedicine service process.

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To improve the tangibility of the quality of telemedicine service, we can start from the following three points. ① Improve telemedicine service-related facilities. Configuration of unified standard equipment; The facilities should be complete, and the purchase should be reasonable; ② Improve the waiting and treatment service equipment. It can provide hot water, newspapers and magazines, etc.; Provide voice reminder function; To provide a convenient and comprehensive electronic professional platform for information sharing, so that patients can fully understand the telemedicine related information and detailed expenses; Strengthen and improve the privacy protection measures to ensure that the patient's private information does not leak. ③ Adhere to civilized service. Establish a sound management system; Add signs of civilized service.

To improve the empathy and responsiveness of the quality of telemedicine service, we can start from the following four points. ① Improve the service attitude of all relevant staff, keep the patients' heart in mind, and cultivate their awareness of "patients' needs as the core". Training the service skills of medical staff; Perfect the technical standard of medical service; Strengthen the training of all employees' professional ethics, professional ability and professional mentality; ② Respect and protect patient privacy. To strengthen the professional training of medical staff; Strengthen the skill operation training of medical staff; Strengthen information protection technology. ③ Build a harmonious doctor-patient relationship. Establish a green channel for patients' complaints and dispute handling; Establish a sound and reasonable medical responsibility planning system, and clarify the medical responsibility among patients, telemedicine service invitees, that is, patients' hospital and service invitees, that is, remote users have better medical resources; ④ Provide personalized and humanized services. According to

the differences of patients' diseases, special services should be provided, such as those who are inconvenient to see a doctor for their reasons, those who need to be transferred to another hospital for treatment due to the local medical technology and equipment conditions; Need to provide rehabilitation treatment help, etc.; At the same time, improve the return visit service process.

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