

# Research on the Relevant Factors Affecting the Development of Internet Medical Care in China

Siqi Ma, Yang Cao\*

School of International Pharmaceutical Business, China Pharmaceutical University, Nanjing, China

Email: cpumsq@163.com, \*caoyang6926@sina.com

**How to cite this paper:** Ma, S. Q., & Cao, Y. (2022). Research on the Relevant Factors Affecting the Development of Internet Medical Care in China. *Advances in Applied Sociology*, 12, 219-226. <https://doi.org/10.4236/aasoci.2022.126019>

**Received:** May 10, 2022

**Accepted:** June 14, 2022

**Published:** June 17, 2022

Copyright © 2022 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). <http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

**Objective:** To analyze the important factors affecting the development of Internet medical care in China, and to put forward relevant policy suggestions. **Methods:** Through expert interviews, 16 factors affecting the development of Internet medical care were summarized, and the Likert scale method was used to investigate the relevant personnel. SPSS22.0 software was used to conduct factor analysis on the obtained survey data. **Results:** Four common factors, namely organizational management factor, information exchange factor, motivation factor and patient motivation factor, were extracted, and their importance decreased in order. **Conclusion:** To promote Internet medical care, it is necessary to improve relevant policies and regulations, formulate relevant standards for Internet medical care and strengthen supervision; improve the establishment of information systems and enhance information security; strengthen incentive mechanisms and policy subsidies; patients increase their own initiative.

## Keywords

Internet Medical Treatment, Factor Analysis, Policy Advice

## 1. Introduction

The application of information technology such as the Internet has promoted the development of the medical and health industry. China has carried out related explorations of Internet medical care since 2014, and issued a number of documents in 2018, which has triggered relevant scholars to study the development methods and methods of Internet medical care from multiple perspectives. The COVID-19 epidemic that will sweep the world in 2022 highlights the advantages of Internet medical care and further promotes the development of Internet medical care in China. Many provinces and cities across the country have

issued relevant policy documents to refine and standardize the development of Internet medical care in the region. China's basic medical insurance coverage rate exceeded 95% in 2011, realizing universal medical insurance. Such outstanding achievements have attracted the attention of the world (Yu, 2015), and its medical insurance policy is also facing challenges from high-speed coverage to high-quality, humanized transformation. Due to the particularity of China's medical security system, Internet medical care can only break through the limitations of its development when it is combined with China's unique medical insurance system. This paper will summarize and sort out the main influencing factors affecting the development of Internet medical care through factor analysis, and put forward corresponding policy suggestions.

Internet medical service is not only a transformation of the traditional medical treatment model, but it can span time and space, improve the accessibility and efficiency of medical services, and reduce costs such as time for patients. It enables patients to obtain high-quality medical services without leaving their homes, which makes up for the problem of inconsistent medical quality across regions and optimizes the allocation of medical resources to a certain extent. Through the establishment of the Internet diagnosis and treatment system, information sharing among public hospitals at all levels, such as tertiary public hospitals and primary medical and health institutions, can be realized, so that each institution can cooperate with each other and complement each other's advantages, which is conducive to promoting the realization of hierarchical diagnosis and treatment and saving medical expenditure costs. Internet medical services can reduce medical costs by reducing disease burden, complication rates, hospitalization rates, disease recurrence rates, and the risk of premature death, while improving people's quality of life, especially in the prevention and long-term care of chronic diseases such as cardiovascular with special potential (Dimitrov, 2016).

## 2. Methods

### Research Design

This paper first analyzes the provinces and cities in China that have developed early and rapid development of Internet medical care, or are representative and can promote its model. The Guangzhou self-built model (Liu & Yang, 2019) was formed earlier and is a pioneer in the development of Internet medical care in China. It was initially developed by large-scale tertiary hospitals with active innovation and is a model that has been continuously improved in practice. Zhejiang is a typical government-led construction of relevant platforms (Chen, 2020), using the advantages of Internet technology to achieve humanized services. Hubei's "Huangzhou Model" is the informatization construction of the medical community in Huanggang District. It has gone out of its characteristics and is at the forefront of the country (Zhong, 2019). The digital-based medical community operation management also promotes grassroots medical services. The Zhenjiang Hospital model is that the affiliated hospital of Jiangsu University ac-

tively explores the deep integration of the Internet and medical health, transforms and upgrades the traditional medical service model, creates a new model of whole-process intelligent medical treatment, and promotes the high-quality development of medical services (Xu & Qian, 2020).

This paper uses EXCEL2013 for input, sorting and descriptive statistical analysis of the data collected by the questionnaire survey, and then uses SPSS22.0 for exploratory factor analysis. Factor analysis is a commonly used dimensionality reduction method in multivariate statistical analysis, which was proposed at the beginning of this century, correlation or covariance relationship. It is a linear combination pattern that decomposes multiple indicator variables with complex relationships into factors.

Based on the methods of literature research and expert interviews, this paper summarizes 16 factors that affect the development of Internet medical care (Table 1), and formulates relevant survey questionnaires accordingly. These indicators are based on the practice of Internet medical care in relevant provinces and cities in China. It can be concluded from the research that it includes many factors such as technology, policy, personnel and so on.

**Table 1.** Relevant factors affecting the development of internet medical care.

No.	Indicator
X <sub>1</sub>	The willingness and support of relevant departments of medical insurance to promote the development of Internet medical care
X <sub>2</sub>	Willingness and ability of medical institution managers to implement relevant policies
X <sub>3</sub>	The degree of perfection of our country's relevant legal system
X <sub>4</sub>	Unified industry technical standards and service specifications
X <sub>5</sub>	The safety of medical insurance funds
X <sub>6</sub>	The government's supervision of Internet medical care
X <sub>7</sub>	The establishment of network information security system
X <sub>8</sub>	Information Sharing in Public Hospitals
X <sub>9</sub>	Risks to Patient Medical Safety Caused by Internet Virtuality
X <sub>10</sub>	Security of Patient Medical Information
X <sub>11</sub>	The number of compound talents in medical staff
X <sub>12</sub>	The enthusiasm of compound talents among medical staff
X <sub>13</sub>	Establish incentive mechanisms for hospitals and doctors, etc.
X <sub>14</sub>	Patient's medical habits
X <sub>15</sub>	Patients' awareness and support for the inclusion of Internet medical care in medical insurance payment
X <sub>16</sub>	Online payment and reimbursement procedures are complicated, especially elderly patients have a poor experience

This survey adopts the Likert scale method to reflect the respondents' evaluation of the importance of various factors affecting the development of Internet medical care, and randomly selects medical insurance-related departments (including health personnel and scholars), medical institution personnel (medical institution managers, medical care providers, etc.). A total of 300 questionnaires were distributed, and 276 valid questionnaires were recovered, with a recovery rate of 92%.

#### 1) Suitability test

According to the KMO test and Bartlett's sphericity test, in this survey, the KMO statistic value is  $0.771 > 0.6$ , indicating that there is no significant difference in the degree of correlation between the variables, and the Bartlett's sphericity test statistic  $\chi^2 = 755.720$ , rejecting the correlation coefficient matrix as a spherical unit matrix. Test the hypothesis, the  $P$  value is  $0.000 < 0.05$ , and reject the spherical test hypothesis that the correlation coefficient matrix is a unit matrix. The results are significant and suitable for factor analysis.

#### 2) Total variance interpretation table

As shown in **Table 2**, four principal components whose initial eigenvalues of the correlation coefficient matrix are greater than 1.0 are extracted, and the cumulative sum of squares of the loadings is 71.982%, indicating that the factors explain the variables very convincingly.

**Table 2.** Total variance interpretation table.

Composition	Initial Eigenvalue			Extraction load sum of squares			Rotation load sum of squares		
	Aggregate	% of variance	Cumulative %	Aggregate	% of variance	Cumulative %	Aggregate	% of variance	Cumulative %
1	7.619	47.620	47.620	7.619	47.620	47.620	3.569	22.308	22.308
2	1.790	11.186	58.806	1.790	11.186	58.806	3.327	20.795	43.103
3	1.091	6.821	65.627	1.091	6.821	65.627	2.483	15.520	58.623
4	1.017	6.354	71.982	1.017	6.354	71.982	2.137	13.359	71.982
5	0.862	5.387	77.369						
6	0.722	4.515	81.883						
7	0.555	3.467	85.350						
8	0.518	3.240	88.591						
9	0.426	2.666	91.256						
10	0.339	2.116	93.373						
11	0.291	1.821	95.194						
12	0.282	1.762	96.956						
13	0.184	1.148	98.104						
14	0.143	0.896	99.000						
15	0.104	0.652	99.651						
16	0.056	0.349	100.000						

Extraction method: principal component analysis.

### 3. Results

The factor model is obtained from the coefficients of the factor loading matrix. The typical variables of most factors are not significant before rotation, so this study needs to rotate the factor loading matrix (Zhang & Xiang, 2016). The 16 factors were summarized and analyzed, and four common factors were extracted. Among them, the common factor 1 had the largest variance contribution rate, accounting for 47.620%, and the cumulative variance contribution rate of the four common factors was 71.982%. According to the data obtained from the factor loading matrix analysis, combined with the analysis of relevant stakeholders that Internet medical care has included in medical insurance payment, the potential common factors of the four influencing factors can be summarized. As shown in Table 3 below:

The public factor 1 has a large load on the five indicators of  $X_1 - X_5$ , which reflects the policy measures, standard specifications and platform security of relevant departments such as government medical insurance and other objective indicators, which can be summarized as the organizational management factor of Internet medical care; for the public factor 2, the load on the five indicators of  $X_6 - X_{10}$  is relatively large, which mainly reflects the establishment of information security and information system based on the Internet, which can be summarized as the information exchange factor; the common factor 3 is loaded on the three indicators of  $X_{11} - X_{13}$  Large, reflecting the incentive policies and positive

**Table 3.** Rotated composition matrix table.

	Composition			
	1	2	3	4
$X_1$	0.342	0.655	-0.109	0.333
$X_2$	0.134	0.784	0.272	0.161
$X_3$	0.322	0.743	0.323	0.184
$X_4$	0.462	0.699	0.235	0.039
$X_5$	0.453	0.612	0.242	0.026
$X_6$	0.772	0.403	0.073	0.007
$X_7$	0.801	0.203	0.045	0.182
$X_8$	0.610	0.413	0.376	0.194
$X_9$	0.809	0.103	0.202	0.030
$X_{10}$	0.652	0.321	0.294	0.190
$X_{11}$	0.306	0.090	0.799	0.334
$X_{12}$	0.265	0.248	0.845	0.151
$X_{13}$	0.020	0.480	0.631	0.177
$X_{14}$	0.030	0.222	0.357	0.796
$X_{15}$	0.242	0.174	0.137	0.724
$X_{16}$	0.025	0.038	0.078	0.730

feedback of medical insurance related departments to medical institutions and medical staff, which can be summarized as incentive factors; the public factor 4 has a large load on the three indicators of  $X_{14}$  -  $X_{16}$ , reflecting the patient's attitude towards The degree of awareness and responsiveness of the policy can be summed up as a patient motivation factor.

In addition, according to the rotated component matrix table in **Table 3**, it can be determined that the contribution rate of the four common factors to the variance is: common factor 1 > common factor 2 > common factor 3 > common factor 4, indicating that common factor 1 has an impact on Internet medical care. The influence is the greatest, and the importance of the other three common factors decreases in order.

To sum up, the common factor 1 in this study shows that the development of Internet medical care is inseparable from the investment of medical insurance related departments in organizational management, and highlights its basic role; common factor 2 shows that in the development process of Internet medical care, which is inseparable from the construction of an Internet information technology platform, which includes not only the information management platform coordinated by the medical insurance department, but also the Internet diagnosis and treatment platform that public hospitals need to establish; public factor 3 shows that only the medical insurance department can establish a reasonable incentive mechanism to meet the needs of public hospitals. The interest appeal of the hospital can stimulate the enthusiasm of public hospitals to develop Internet medical care; public factor 4 shows that satisfying the interest appeal of patients, so that it can bring benefits to themselves when choosing Internet medical treatment, is also an important factor affecting Internet medical care.

## 4. Suggestion

### 4.1. Medical Insurance Department Improves Relevant Policies and Regulations, Formulates Relevant Standards for Internet Medical Care and Strengthens Supervision

First of all, it is necessary to build an access mechanism in line with the development of the Internet medical industry to prevent the continued deterioration of the mixed situation of Internet hospitals in the market. The specifications should be refined for different platforms to ensure the security of Internet medical care from the source. When formulating relevant regulations and policies, different types of Internet medical services can be regulated. Recognition of the qualifications of medical staff also needs to be accompanied by corresponding measures. A consultant team can be formed by relevant medical experts, legal advisers, government personnel, etc. to conduct safety assessments and publish the results in a timely manner.

Secondly, to formulate relevant norms that can ensure the safety of Internet medical care, we should formulate and improve relevant legal systems and policies and regulations to clarify the responsibilities of all parties in the process of

Internet diagnosis and treatment; we should ensure the completeness and use of hardware and software facilities, especially Internet medical care. It involves a third-party platform that provides information technology support, to prevent the occurrence of medical malpractice, so as to ensure the quality of Internet medical care. Only in this way can the medical malpractice be properly punished or compensated, and the interests of public hospitals and patients can be protected by law.

#### **4.2. Improve the Establishment of Information Systems and Enhance Information Security**

Government departments need to improve the construction of the network security system to protect the privacy of patients as much as possible. At the same time, it is necessary to improve the supervision of the Internet medical insurance information system to prevent the occurrence of malicious incidents such as fraudulent insurance. In addition, it is also necessary to establish a security handling plan, so that when an urgent data breach occurs, it can quickly feedback and handle it efficiently.

Secondly, for each medical institution, it is also necessary for government departments to guide the construction of its Internet platform, explore the best management model that meets the development needs of the medical institution, and achieve humanized management to improve patient satisfaction, and in turn facilitate the choice of active reform strategies in the health insurance sector.

#### **4.3. Strengthen Incentive Mechanisms and Policy Subsidies**

Relevant government departments can start from two aspects: institutional incentives and economic subsidies. On the one hand, public hospitals are required to complete corresponding Internet medical development indicators, and they are appropriately linked to hospital evaluation; on the other hand, public hospitals are required to build Internet platforms, etc. Economic subsidies are provided for cost expenditures. At the same time, public hospitals can also strengthen the incentive mechanism for doctors, such as linking the duration of online diagnosis and treatment with professional title evaluation, etc., to show the importance attached to the development of Internet medical care, and to encourage more doctors to provide Internet diagnosis and treatment services, forming a virtuous circle.

#### **4.4. Patients Increase Their Own Initiative**

First of all, patients should strengthen the learning of the application of the Internet platform, especially the elderly patient group. In addition to the active popularization and promotion of policies by government departments, offline personnel should strengthen the guidance of patients. At the same time, family members of patients should be encouraged to handle Internet medical services for the patients themselves, related services and procedures.

Secondly, patients need to strengthen the learning of personal information security knowledge, be vigilant, and prevent their medical and health information from being accidentally leaked. You should pay attention to relevant government policy documents, learn how to protect the security of personal information, do not install unknown software because of petty gain, do not trust unofficial websites, and form a good awareness of prevention.

### Conflicts of Interest

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

### References

- Chen, Y. G. (2020). Hangzhou Builds the Practice Path of Medical Insurance “Internet + Handling” Service Model. *China Medical Insurance*, *No. 7*, 49-52.
- Dimitrov, D. V. (2016). Medical Internet of Things and Big Data in Healthcare. *Healthcare Informatics Research*, *22*, 156-163.
- Liu, H. R., & Yang, B. (2019). The Current Situation and Countermeasures of “Internet +” Medical Treatment. *Science and Technology Information*, *17*, 177-178.  
<https://doi.org/10.4258/hir.2016.22.3.156>
- Xu, Y. Z., & Qian, X. Q. (2020). Promoting the High-Quality Development of Medical Services with a New Model of Whole-Process Intelligent Medical Treatment. *Jiangsu Health Management*, *31*, 153-155.
- Yu, H. (2015). Universal Health Insurance Coverage for 1.3 Billion People: What Accounts for China’s Success? *Health Policy*, *119*, 1145-1152.  
<https://doi.org/10.1016/j.healthpol.2015.07.008>
- Zhang, J., & Xiang, Y. (2016). Analysis of the Status and Influencing Factors of the Use of Electronic Health Records among Residents in Hangzhou. *China Health Service Management*, *33*, 311-314.
- Zhong, J. P. (2019). The “Huangzhou Model” of Building a Digital Medical Community in Huanggang City, Hubei Province. *China Health*, *No. 9*, 107-108.