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A case study of inpatient loyalty in West China Hospital

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Abstract. The survey was conducting through field interviews based on a questionnaire that was designed by the researchers and conducted in West China Hospital of Sichuan University in autumn of 2009 on a sample of 300 inpatients that were selected at random. This study identifies seven factors that influence loyalty of the inpatients: doctor service quality, nursing service quality, auxiliary service quality, switching costs, facilities and equipments of the hospital, time costs and brand image. And structural equation model (SEM) was used to explore those factors' impact degree. An empirical test of the relationships among these factors hopes to offer some valuable clues for establishing core competitive power of the hospitals in China and improving the management of health care marketing

Keywords: medical service, patient loyalty, factor analysis, structural equation model

1 Introduction

According to CPC Central Committee and State Council on Deepening the Views of Medical and Health System Reform, deepening the views of medical and health system reform, speeding up the development of medical and health sector, adapting to people's increasing demand for medical and health ,improving the quality of people's health continuously are all necessary requirements for implementing the concept of scientific development, promoting comprehensive, coordinated and sustainable development of economy and society; are important measures to safeguard social fairness and justice and improve people's quality of life; are significant tasks for comprehensively building a moderately prosperous society and a harmonious socialist society. Clearly, constructing a hospital with advanced facilities and equipments, skilled medical, comprehensive and thoughtful service, has become an important foundation for deepening medical and health reform, developing a harmonious society. In order to get the pictures of hospital building clearly and improve the management of hospital construction and medical industries' service, this article plans to build an index system, analysis the impact elements of inpatient loyalty. An empirical research on the West China Hospital of Sichuan University which located in Chengdu was performed. This study wants to offer some valuable clues for each type of hospitals to build and upgrade their core competencies.

2 The selection of patient loyalty measurement indicators

The concept of patient loyalty stems from customer loyalty. Customer loyalty has been well studied, but strong disagreement persists. In the early research of customer loyalty, the scholars focused on the behavioral loyalty from the customer behavior perspective. For example, Jacoby & Chestnut[4] defined the high frequency of purchase as loyalty; Tucker defined consecutive 3 times' purchase as customer loyalty; Blattberg & Sen[9] defined the proportion of the purchase rather than the result of the purchase as the measure of loyalty behavior.

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Table 1. Patients loyalty with pre-evaluation indicators

	Factor	Indices
Loyalty	Attitudinal Loyalty (L1)	Level of understanding of the hospital (Q1), Degree of preference to the hospital (Q2), The possibility of preferring to the hospital in the next illness (Q3), The will of keeping going to the hospital (Q4)
	Behavioral Loyalty (L2)	Afford ability of the hospital medical effects (Q5), The proportion of the number of medical visits to the hospital in the total number of medical visits (Q6), The intensity of recommending the hospital to others (Q7)

Table 2. Patient loyalty with pre-set influential factors and observation indicators

	Factor	Indices
Hospital Image	Brand image	Hospital reputation(V1), Hospital credibility (V2), The adequacy of the information hospital published(V3), The accessibility of collecting hospital information (V4)
	Facility Instrument	Facility Instrument Degree of well-equipped of hospital facilities (V5), Degree of advanced of hospital medical equipment (V6), Degree of goodness of hospital infrastructure (V7)
	Medical Care Environment	The convenience of taking medicine from the hospital dispensary(V8), The comfort level of hospital in-patient facilities (V9), Hospital hygiene condition (V10)
Quality of Service	Technical Quality	Quality of Service, Technical Quality, The medical level of attending doctors (V11), Curative effect level of attending doctors (V12), The nursing level of nurses (V13), The nursing efficacy of nurses (V14)
	Functional Quality	The length of the attending doctor rounds time (V15), The detail level of attending doctors explain and guidance (V16), The communication and care level of attending doctors (V17),The fitness of medical examinations and inspections quantity (V18), the degree of nurses arrival speed (V19), The detail level of nursing care (V20), The detail level of nursing health guidance (V21),The thoughtful Level of medical inquiry service (V22), The efficiency of handling medical care issues and complaints (V23)
Trust relation-ship	Service Attitude	The inquisition attitude of attending doctors (V24), The attitude of nursing care (V25), The service attitude of other medical technicians (V26)
Switching Cost	Medical Care Costs	Medical cost performance (V27), The degree of saving traffic time when go to hospital (V28), The degree of saving rehabilitation time (V29)
	Switching Cost	Patients have to pay a high cost for collecting other hospitals' information before changing hospital (V30), Patients have to pay a high cost to give up already spent cost after changing hospital (V31), Patients have to pay a high cost to build new trust relationships with doctors after changing hospital (V32), Patients have to pay a high cost to build new trust relationships with hospital after changing hospital (V33)

Customers' behavioral loyalty can reflect the actual consumer behavior, however, can not explain the underlying causes why the customers buy certain products and services repeatedly. As a result, some scholars began to research attitudinal loyalty from the perspective of customers' emotion, awareness and purchase behavior tendencies on specific products or services. For example, Ajzen & Fishbein[10] believed that loyalty was the customers' propensity degree of positive attitude toward the products and services; Dick and Basu[11] indicated that only when repeat purchasing behavior accompanied by a higher attitude, a real customer loyalty came; Griffin[12] combined customers behavior and attitudes together and divided the customer loyalty into four states: disloyalty, false loyalty, latent loyalty, and loyalty, basing on repeat purchase frequency and intensity of a positive attitude[2]; Cremler and Brown further defined service customer loyalty as customers show

the extent of repeat purchase behavior on specific service providers and propensity degree of positive attitudes toward those service providers, as well as when customers increase demands for the service, the tendency they would show that they continue choose those service providers as the only one choice[7]. It can be seen that customer loyalty should be a unity with more positive attitude and more frequent repeat purchase behavior. Based on the above analysis, this paper presupposed index system for patient loyalty from the attitudinal loyalty and behavioral loyalty perspective, combining the characteristics of medical services. The loyalty measurement indicators are showed as Tab. 1.

3 Patient loyalty influence factors and its observation indicators analysis

Influencing factors on customer loyalty have had a large number of results. A typical study of service industry was showed that customer loyalty influence factors are core quality, relationship quality, perceived value, switching intentions and customer satisfaction[5]. A loyalty model structure for energy services indicated that the factors include customer value, company reputation and customer satisfaction[5]. Yan and Jia[3] showed in study of mobile communication services loyalty that the loyalty influence factors have four aspects: customer satisfaction, trust relationship, switching cost and alternative attractiveness. Yong[8] proposed that factors affecting loyalty are: customer perceived value, switching costs, customers trust and competitors attraction. Meng[6] believed that the driving factors of customer loyalty are customer perceived value, customer satisfaction, environmental factors and switching costs in the study of third-party logistics companies' customer service. Fang[1] thought that the impact factors of loyalty are customer satisfaction, relationship trust, customer value and switching costs, and customer value also contains two factors which are service quality and corporate image.

Actually, ECSI model showed that customer perceived value and customer satisfaction were the results of expected quality, perceived quality and corporate image. Therefore, this article argued that the impact factors listed in the literature above-mentioned, quality of service, brand image, trust relationship and switching costs are more origin and main factors for loyalty. Moreover, those four aspects were presupposed the patient loyalty influence factors in this study. Combining the four factors above with the specific characteristics of health care service, this paper presupposed factors and observation system affecting loyalty of patients which was showed in Tab. 2.

4 Methodology

4.1 Sample selection

Research data of this paper was collected in the form of questionnaire and chose West China Hospital of Sichuan University which is located in Chengdu as a research object. The hospital is a large general hospital which has a satisfactory variety of professionals, skilled medical technologies, advanced equipments, strong R & D and has a high reputation in China. The hospital has discharged patients up to 90,000 annually. This shows that patients with a high degree of loyalty to the hospital. It has a stronger representation to select West China Hospital of Sichuan University as the research object. Inpatients' emphasis on hospital choice taken into consideration, and they had experienced the various processes more fully, so research data chose inpatients as the collection object. The questionnaire was designed on the base of observed indicators in Tab. 2 and Tab. 3. The questions were arranged by logical order of medical treatment and were mainly answerable by 5-point Likert scales, from 1 to 9. In order to avoid patients' concerns and ensure that the data can reflect the wishes of patients truly, all survey was anonymous and the implementation was standing in the third-party's neutral point of view. After developing and piloting a questionnaire to investigate the inpatient loyalty, the modified survey questionnaires were sent to West China Hospital of Sichuan University. In all, 300 questionnaires were distributed while 287 responses were returned. Eighty-three surveys were disqualified for lack of completeness leaving 204 usable for data analysis. The appropriateness test on the data in Tab. 3 and 4 showed that questionnaire's reliability and validity requirements are met. This implies that the data is appropriate for confirmatory factoring.

4.2 Refining of the loyalty pre-evaluation indicators

Firstly, according to Michael. Tracey[13] each indicator factor loadings should be only one common factor loading is greater than 0.5, but other common factors loading should not exceed 0.4, otherwise the factor should be rounding. As a result, the loyalty observation indicators in the table were all retained. Secondly, only one principal component was extracted from analysis. Q1, Q2, Q3, Q4, Q5, Q6, Q7 can not be divided into the attitudinal loyalty and behavioral loyalty, but rather as a factor. And the only one factor was interpreted as loyalty to the hospital inpatients. 4.3 Extraciong loyalty influence factor and refining the observation indicators Using the same method above, some loyalty observation indicators—V2, V3, V5, V9, V10, V11, V15, V17, V18, V24, V27—were excluded, and seven principal components were extracted. According to the degree of variance explained, the components are in descending order as the following in Tab. 5. Comparing Tab. 2 and

Table 3. Reliability analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
956	40

Table 4. Validity analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling AdeVuacy		.923
Bartlett's Test of Sphericity	Approx. Chi-SVuare	4.873E3
	df	780
	sig	.000

Table 5. The inpatient loyalty influence factors extraction table

Factor	Observation indicators	Factors explained
F1	V13, V14, V19, V20, V21, V25	Nursing service quality
F2	V12, V16	Doctor service quality
F3	V22, V23, V26, V29	Auxiliary service quality
F4	V30, V31, V32, V33	Switching costs
F5	V6, V7	Hospital facilities and equipments
F6	V8, V28	Time cost
F7	V1, V4	Hospital brand image

5, some results can be found. The original observed indicators of service quality and trust relationship together became three factors: nursing service quality, doctor service quality, auxiliary service quality. This is due to original observation indicators of service quality factors was designed on the base of the idea that quality of service was divided into the technical quality and functional quality. Trust relationship is mainly related to the service attitude, while the patient considering from the source point of view, attributed the technical quality of medical services, functions quality and trust relationship to nursing service quality, doctor service quality, auxiliary service quality. All indicators for nurses were reserved and this may show that the all aspects of nursing service quality in the whole medical treatment process which are contacted with patients closely have an impact on the patients; doctor service quality only retain two indicators–V12 and V16-that reflects the patients pay less attention to other aspects of doctor service quality, while they focus on– medical treatment level and the detail level of guidance and interpretation of doctor–these two more technical indicators. Auxiliary service quality included V22, V23, V26 and V29 which indicated that patients in the course of medical treatment not only concerned about the doctors and nurses' service quality, but also pay attention to the inquiries and complaints service, and other auxiliary services such as service attitude. The original switching costs observation indicators were all retained. The original medical care environment observation indicators V9 and V10 were excluded which indicated that hospital facilities and health status were not a concern. The only reserved medical care environment observation indicator V8 combined with the original medical treatment costs observation indicator V28 to be one factor. Those showed that patients attached great importance to quick access

to services and the extent of time savings throughout the course of medical treatment. So this study explained the indicators as time-cost factor and this factor was parted from the switching costs as a separate factor. The pre-set hospital image was consisted with three aspects: brand image, facilities and equipments, medical care environment. Among them, medical care environments had been analyzed earlier. Brand image only keep V1 and V4, facilities and equipment retained only the V6, V7. Brand image, facilities and equipments made up two separate factors indicated that the advanced and goodness degree of facilities and equipments are an important consideration and they are different from brand image for inpatients. So this article would study facilities and equipment as one separate factor.

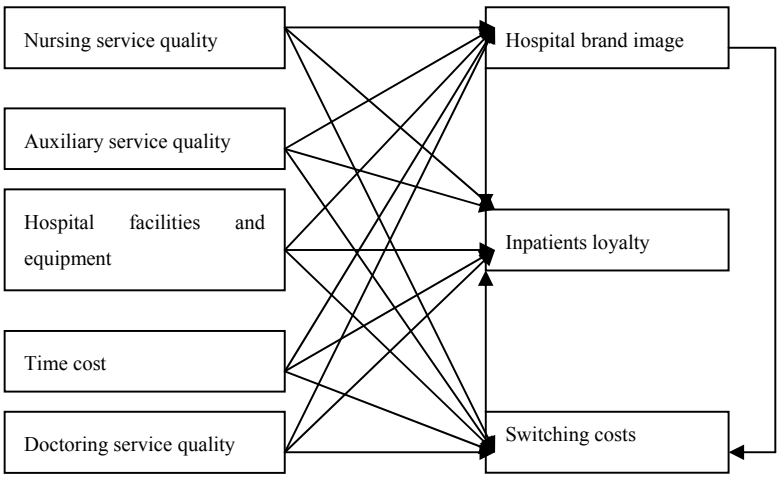

Fig. 1. Structural model

4.3 Research model and hypotheses

Based on the above analysis, and combined with the basic characteristics of health care services to determine and the relationship that may exist between pairs of factors, this article made hypotheses as the following:

1. Service Quality

(1) Quality of technical service.

H1: Nursing service quality has a positive impact on inpatient loyalty;
H2: Doctor service quality has a positive impact on inpatient loyalty;
H3: Nursing service quality has a positive impact on hospital band image;
H4: Doctor service quality has a positive impact on hospital band image;
H5: Nursing service quality has a positive impact on switching costs;
H6: Doctor service quality has a positive impact on switching costs.

(2) Quality of functional service.

H7: Auxiliary service quality has a positive impact on inpatient loyalty;
H8: Auxiliary service quality has a positive impact on hospital band image;
H9: Auxiliary service quality has a positive impact on switching costs.

2. Switching costs

(1) Switching costs.

H10: Switching costs has a positive impact on inpatient loyalty;

(2) Time cost.

H11: Time cost has a positive impact on hospital band image;
H12: Time cost has a positive impact on inpatient loyalty;
H13: Time cost has a positive impact on switching costs.

3. Hospital image

(1) Band image.

H14: Hospital band image has a positive impact on inpatient loyalty;
H15: Hospital band image has a positive impact on switching costs.
(2) Facilities and equipments.
H16: Hospital facilities and equipments has a positive impact on hospital band image;
H17: Hospital facilities and equipments has a positive impact on inpatient loyalty;
H18: Hospital facilities and equipments has a positive impact on switching costs Combined with hypotheses above, this paper build model structure which is showed in Fig. 1.

4.4 Structural models results and hypothesis testing

In order to obtain the best inpatients - doctor loyalty model which can reflect the characteristics of medical service, we applied generation model-based analysis to build and analyses model. The so-called generation model analysis is to propose one or more basic models at first, then check whether these models fit the data, find out the poorly fitted part on the base of theoretical or sample data, modify models, and then check the modified model's goodness of fit. The entire analysis process aims to produce a best model. By using of this best model, not only parameter estimation of the model can be known, but goodness of fit between survey sample data and models can be found out as well. The most important is that some valuable conclusions could be gained on the base of the relationship and its intensity among variables related to the structure. The structural equation model in Fig. 1 was applied to the research model using LISREL8.70. Tab. 4 shows the fitting parameters for the original model and series of amendment models Tab. 6. The output displayed that

Table 6. The results of the multiple-group sem analysis

Model	Amends	df	2	RMSEA	NFI	CFI
M 11	Initial model	332	677.32	0.074	0.93	0.96
M 12	GA (3,3) free	323	680.92	0.074	0.93	0.96
M 13	GA (1,1) free	324	677.49	0.073	0.93	0.96
M 14	GA (4,3) + GA (2,1) free	326	681.27	0.073	0.93	0.97

factor loadings, factor covariance between the error variance t-tests of model M14 are significant, and a variety of fit indicators are statistically significant and thus M14 is a reasonable estimate. Comparing the models above, we find that the best model is model M14 and its resulting parameter estimates for the standardized solution are shown in Fig. 2.

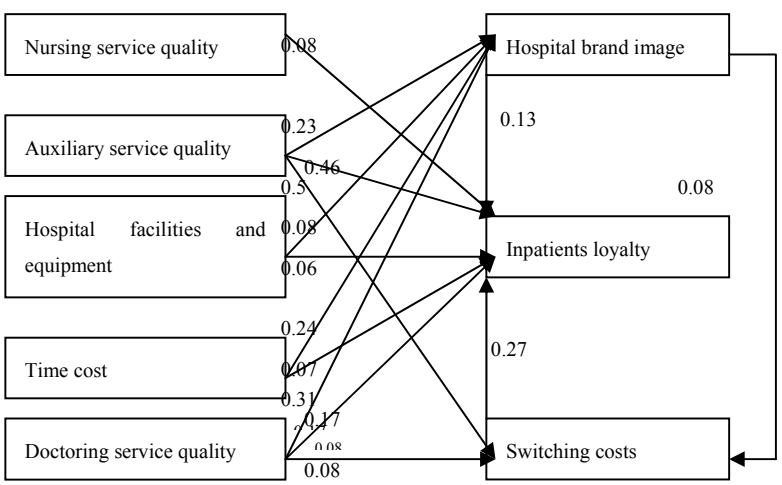

Fig. 2. Structural model

5 Results of analysis

Doctor service quality, time cost, auxiliary service quality, facilities and equipments have a significant impact on the factor of brand image, while the nursing service quality's influence on brand image is not significant. Among the significant influence factors, doctor service quality has the greatest impact on brand image which indicates that patients of West China Hospital firstly take the level of doctors' skill and professionalism into consideration to judge the brand image. Time cost, as the second important factor, demonstrates that the operational efficiency of the medical service system has become an important criterion to make time cost become a separated factor different from band image. The auxiliary service quality becomes the third impact factor of the brand image with a small gap indicates that auxiliary service sectors has become an important elements of brand image.

Auxiliary service quality, doctor service quality and brand image have a significant impact on switching costs, while the nursing service quality and time cost's influence on brand image are not significant. The impact of switching costs is mainly from the secondary service quality which further reveals the service links play an important role in the patient's loyalty building. And the time cost's influence on brand image is not significant that further proves the independent study of time cost is correct.

Auxiliary service quality, switching costs, doctor service quality, brand image, nursing service quality, time cost and facilities and equipment all have a significant impact on inpatient loyalty. Descending by influence coefficient, auxiliary service quality, switching costs, doctor service quality, brand image round out the top four. Integrated direct and indirect effects, auxiliary service quality together with the doctor service quality impact inpatient loyalty of West China Hospital as the most important factors.

Particularly, the quality of service of nurses has a significant effect on inpatients loyalty, but the impact on brand image and switching costs are not significant, and its impact on inpatient loyalty is also relatively small. This shows that the nursing service quality has become the short-board of inpatients loyalty building of West China Hospital.

The factor of facilities and equipments has a significant effect on brand image and inpatients loyalty, but influence intensity is very small. This shows that patients choose medical treatment would take facilities and equipments of the hospital into consideration, but not as the major factor.

6 Conclusion

The empirical analysis of inpatients loyalty of West China Hospital shows that China's medical service is gradually entering an era of full-service market competition. Whether it is an extension of service or improving the service efficiency of the hospital has become an important source of the core competitiveness. The hospital building should gradually shift its concerns to improve full-service system and service efficiency on the base of the consolidation of medical technology and the construction of facilities and equipments.

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