

Evaluation of medical staff and patient satisfaction of Chinese hospitals and measures for improvement

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Summary

Our goal is to establish criteria for evaluating satisfaction of medical staff and patients of Chinese hospitals and propose measures for improvement. A survey was conducted among medical staff and patients of infectious disease hospitals in three locations, *i.e.*, Shanghai, Chongqing, and Nanning. The analyses included item analysis, factor analysis, reliability analysis, Pearson correlation and one-way analysis of variance. For the patient group, Kaiser-Meyer-Olkin (KMO) = 0.973, Cronbach's α = 0.962 and the Pearson correlation coefficients among the five dimensions of satisfaction ranged from 0.583 to 0.795. For the medical staff group, KMO = 0.972, Cronbach's α = 0.970, and the Pearson correlation coefficients among the five dimensions of satisfaction ranged from 0.603 to 0.854. The means on the five dimensions of satisfaction for the patient group were 0.74 to 1.34, 0.81 to 1.17, 0.78 to 1.07, 0.89 to 1.34, and 0.71 to 1.10. The means on the five dimensions of satisfaction for the medical staff group were 0.17 to 1.03, -0.16 to 0.60, -0.18 to 0.74, 0.23 to 0.72, and -0.39 to 0.37. The clinicians were less satisfied with the hospitals than the patients. Medical staff and patients in Shanghai were relatively more satisfied. Improving the evaluation criteria and survey methods with respect to medical staff and patient satisfaction with Chinese hospitals may increase clinician and patient satisfaction and improve the health care environment in China.

Keywords: Chinese hospitals, medical staff, patients, satisfaction, evaluation criteria

1. Introduction

Patient satisfaction is one of the important criteria for evaluating credentials of hospitals and performance of hospitals in China (1-6). Self-assessment conducted monthly at hospitals in Shanghai using patient satisfaction questionnaires developed by third-party agencies indicate that patient satisfaction is above 96%. Results from the annual assessments of 2014 conducted by third-party agencies indicate that patient satisfaction with comprehensive hospitals was higher than that with specialized hospitals, that out-patient satisfaction

rate was 91.03%, while in-patient satisfaction rate was 97.56%, and satisfaction rate with some medical facilities was as high as 100%. These results contradict data collected by Wen Xueguo and others, showing that medical disputes in China are increasing. The incidence of medical dispute has a negative correlation with the level of credentials of the hospital, with the shape of an "inverse-pyramid". Patient violence has damaged clinicians' enthusiasm for providing care, creating a negative influence on the stability of the medical staff and the development of elite medical experts for the future. Incidents of patients attacking or even killing their doctors have been reported frequently (7), leading to a vicious circle for the relationship between clinicians and patients (8-12).

Several factors are responsible for the fact that patient satisfaction surveys in China fail to reflect the reality on the ground (2,13). These include the fact that the survey questionnaires only reflect patient satisfaction using two aspects of the hospitals' services,

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i.e. tangibles (such as efficiency, regulations for charging fees and service quality) and reliability. They neglected patients' evaluation of the hospitals soft and hardware facilities, convenience, the patients' needs and their trust for the professionalism of the medical staff, responsiveness to patients and whether the hospitals are considerate toward the patients. In other words, the surveys neglected the five dimensions of service quality, *i.e.*, tangibles, reliability, responsiveness, assurance and empathy (14). They tend to neglect the real reasons for patients' dissatisfaction in the process of seeking medical care.

Although Almeida RS (2015) believes that there is no gold standard for the evaluation of patient satisfaction, such assessments should include certain dimensions (15). Ching-Sheng Chang (2013) believes that improving service quality in the three dimensions of reliability, assurance and empathy may indirectly increase patient satisfaction (16). Ping Lei (2012) believes that improving service quality may increase patient satisfaction (17). The research of Min Li (2014-2015) and others suggest that improving service quality may increase the satisfaction levels of medical staff and patients (18-22). In 1982, the Finnish scholar Christian Gronroos first proposed the concept of perceived service quality, and in 1984 he proposed the perceived quality model. In 1985, American scholars Parasuraman, Zeithaml and Berry (PZB) put forward the gaps model on the basis of the perceived quality model. PZB simplified the gaps model to develop a service qualities (SERQUAL) scale with five dimensions in 1988, and in 1991 they reworded the negative valence questions into positive-valence questions to make the final version of the ServQual scale. The ServQual questionnaire tool has been widely applied to measure performance in the service industries, including medical services at hospitals worldwide (14,23-29). In this study, Separate Satisfaction Survey Questionnaires were developed for medical staff and patients respectively, using the ServQual Scale as the theoretical basis (24,27-28), with the purpose of establishing and verifying the criteria for evaluating satisfaction of medical staff and patients with hospitals. Comparisons were made among hospitals in three locations, *i.e.*, Shanghai, Chongqing and Nanning of Guangxi in terms of satisfaction of patients and medical staff. The study provides useful information for improving the evaluation of satisfaction of medical staff and patients with Chinese hospitals.

2. Materials and Methods

2.1. Subjects

Shanghai has the highest Gross Domestic Product (GDP) in Greater China. Chongqing is China's largest municipality, a city-group with large urban, rural, mountainous and water-reservoir areas. Nanning is the

capital of Guangxi Zhuang Autonomous Region and the core city of the Beibu Gulf Economic Zone. At the end of 2013, Shanghai had 24.1515 million permanent residents, a gross domestic product (GDP) of 2,160.212 billion Yuan, and a per capita GDP of 90,1000 Yuan (30). Chongqing had a population of 33.5842 million registered residents, a GDP of 1265.669 billion Yuan and per capita GDP of 42,800 Yuan (31); Nanning had a population of registered residents of 7.2443 million, a GDP of 280.354 billion Yuan and per capita GDP of 39,000 Yuan (32). Shanghai is a first-tier city in China. Chongqing is a second-tier city, while Nanning is a third-tier city. The three hospitals for infectious disease surveyed in this study are similar in scale, each with approximately 500 beds. In this study, subjects were medical staff and patients from three hospitals for infectious diseases from three cities, *i.e.*, Shanghai, Chongqing and Nanning.

2.2. Questionnaire

A ServQual Scale for Evaluating Patients' perception of Service Quality and a ServQual Scale for Evaluating Clinicians' perception Service Quality were designed on the basis of literature review. Both scales included two components: *i*) respondent information and *ii*) the 22 questions in the five dimensions of the ServQual scale.

Surveys from patients are performed randomly and in clinicians by the method of cluster-sampling. After removing those questionnaires which contain only one single answer or logic errors or repeating answers or missing values, which accounts for more than 5% of the questionnaires: In patient group, 2,115 copies of questionnaire were issued, and 1,987 questionnaires were recovered, the effective questionnaires were 1,304, and the effective recovery rate was 65.63%. In medical staff group, 1,139 copies of questionnaire were issued, 1,086 questionnaires were recovered, the effective questionnaires were 963, and the effective recovery rate was 88.6%.

2.3. Codes

i) Respondent informations: Gender: 1 for male, 2 for female. Age: 1 for those equal or less than 29 years old, 2 for 30-39 years old, 3 for 40-49 years old, 4 for 50-59 years old, 5 for those equal to or over 60 years old. Area: 1 for Shanghai, 2 for Chongqing, 3 for Nanning. *ii*) Contents of the questionnaire: questions about Tangibles were labeled T1-4; Reliability, L5-9; Response, S10-13, Assurance, A14-17; Empathy, E18-22. Response to each question was scored using a Likert-type scale 5-point method: -2 was very dissatisfied, -1 was not satisfied, 0 was neutral, 1 was satisfied, 2 was very satisfied. All 22 questions were framed positively. *iii*) Patients group. Education: 1 for primary school and below, 2 for middle school, 3 for undergraduate, 4 for master's degree

and above. Place of residence: 1 for city, 2 for rural areas. Medical treatment mode: 1 for outpatients, 2 for hospitalization patients. Medical staff group. Education: 1 for junior college and below, 2 for undergraduate students, 3 for Master's degree, 4 for Doctor's degree. Occupation: 1 for doctor, 2 for nurse, 3 for technician, 4 for management staff, 5 for support staff.

2.4. Data entry and statistics analyses

The Statistical Package for the Social Science (SPSS) 22.0 statistics package was used for data entry, proofreading, and statistical analysis, including project analysis, reliability analysis and validity analysis, Pearson correlation, descriptive statistics, one-way analyses of variance (33-35).

3. Results

3.1. Project analysis

Medical staff group and the patient group were analyzed through critical ratios, independent samples *t* test, 2 sets of scales including 22 items which had significant difference, and 22 problems were kept.

3.2. Reliability analysis and validity analysis

Patient group: Kaiser-Meyer-Olkin (KMO) was 0.973, Cronbach's Alpha was 0.962. Medical staff group: KMO was 0.972. Cronbach's Alpha was 0.970. Results showed 2 versions questionnaires were reliable and valid.

3.3. Pearson correlation

The Pearson correlation (two tailed) of 5 dimensions of

medical staff group and the patient group were 0.583-0.795 and 0.603-0.854, respectively. They had a highly correlated significant difference.

3.4. Descriptive statistics

3.4.1. Patient information

A total of 38.42%, 12.19%, and 49.39% patients were subjected to the test in 3 infectious disease hospitals occurring in Shanghai, Chongqing, and Nanning, respectively. Patients from Shanghai were mainly city male outpatients, who were aged 39 and below, with secondary and university education; Patients from Chongqing were mainly rural male inpatients with secondary education, who were aged 39 and below; Patients from Nanning were mainly rural male patients with only secondary education, who were aged 39 and below. The proportion of inpatient to outpatient was 1:1. Patients who are more than 60 years old accounted for 17.1% in this group. The results are shown in Table 1.

3.4.2. Medical staff information

A total of 38.73%, 18.90%, and 42.37% medical staff were subjected to the test in 3 infectious disease hospitals distributed in Shanghai, Chongqing, and Nanning, respectively. The medical staff tested were mainly female nurses, who were aged 39 and below, with university or below education. The proportion is the same as that of the Chinese public hospital personnel structure.

In Shanghai, the medical staff tested with university or above education account for 19.3%. In Chongqing, medical staff respondents were mainly made up of first-line clinical medical staff, most of medical staff

Table 1. Sociological characteristics of patients of 3 infectious diseases hospitals in this study

Content	Shanghai		Chongqing		Nanning	
	n = 501	Percentage	n = 159	Percentage	n = 644	Percentage
Gender						
Male	365	72.9	97	61.0	393	61.0
Female	135	26.9	62	39.0	247	38.4
Age						
≤ 29 age	147	29.3	43	27.0	118	18.3
30-39 age	173	34.5	54	34.0	172	26.7
40-49 age	88	17.6	27	17.0	146	22.7
50-59 age	55	11.0	22	13.8	95	14.8
≥ 60 age	36	7.2	12	7.5	110	17.1
Education						
primary school and below	25	5.0	37	23.3	146	22.7
middle school	218	43.5	75	47.2	358	55.6
undergraduate	236	47.1	47	29.6	122	18.9
master's degree and above	18	3.6	/	/	4	0.6
Home						
City	315	62.9	68	42.8	281	43.6
Rural	180	35.9	89	56.0	355	55.1
MedicalPay						
Outpatient patients	414	82.6	18	11.3	315	48.9
Hospitalization patients	87	17.4	140	88.1	329	51.1

respondents of Nanning were below 49 years old (Table 2). In order to unify the research object, doctor, nurse and technicians were retained for analysis in Table 2.

3.4.3. The average value of ServQual scale item

i) Average of 22 questions. Outpatients and hospitalization patients: the average of Shanghai group were 0.8-1.29 and 0.91-1.49, respectively, the average of Chongqing group were 0.56-1.12 and 0.73-1.16, respectively, and the average of Nanning group were 0.67-1.04 and 0.81-1.22, respectively. The satisfaction of

hospitalized patients were higher than that of outpatients. The doctors, nurses and technicians of medical staff: the average of Shanghai group were 0.12-1.22, 0.07-1.20, and 0.28-1.06, respectively, the average of Chongqing group were - 0.43-0.70, - 0.50-0.83, and - 0.30-0.68, respectively, and the average of Nanning group were - 0.08-0.78, 0.16-0.71, and 0.2-0.77, respectively. The satisfaction of medical staff was lower than that of patients, the value was between not satisfied to general. ii) The average value of 5 dimensions: Values of patients group were 0.74-1.34, 0.81-1.17, 0.78-1.07, 0.89-1.34, and 0.71-1.10, respectively. They were lower

Table 2. Sociological characteristics of medical staff of 3 infectious diseases hospitals in this study

Content	Shanghai		Chongqing		Nanning	
	n = 373	Percentage	n = 182	Percentage	n = 408	Percentage
Gender						
Male	108	29.0	42	23.1	106	26.0
Female	261	70.0	133	73.1	300	73.5
Age						
≤ 29 age	118	31.6	63	34.6	149	36.5
30-39 age	157	42.1	75	41.2	113	27.7
40-49 age	74	19.8	31	17.0	107	26.2
50-59 age	18	4.8	11	6.0	35	8.6
≥ 60 age	3	0.8	2	1.1	1	0.2
Education						
junior college and below undergraduate students	155	41.6	80	44.0	189	46.3
master's degree	141	37.8	99	54.4	197	48.3
doctor's degree	58	15.5	2	1.1	17	4.2
doctor's degree	14	3.8	/	/	/	/
Occupation						
doctor	67	18.0	44	24.2	128	31.4
nurse	134	35.9	98	53.8	210	51.5
technicians	90	24.1	37	20.3	44	10.8
management staff	47	12.6	/	/	26	6.4
support staff	33	8.8	/	/	/	/

Table 3. The total average value of medical staff and patients and the average value of 5 dimensions in 3 infectious diseases hospitals

Area/Content	Mean ± S.D.					
	Total average value	Tangibles	Reliability	Responsiveness	Assurance	Empathy
Shanghai						
Outpatient patients	1.01 ± 0.57	1.16 ± 0.54	1.08 ± 0.60	0.89 ± 0.68	1.09 ± 0.64	0.83 ± 0.74
Hospitalization patients	1.20 ± 0.57	1.34 ± 0.51	1.17 ± 0.56	1.07 ± 0.66	1.34 ± 0.67	1.10 ± 0.73
Chongqing						
Outpatient patients	0.87 ± 0.51	0.74 ± 0.45	0.88 ± 0.63	0.78 ± 0.67	1.00 ± 0.54	0.93 ± 0.55
Hospitalization patients	0.99 ± 0.41	0.88 ± 0.46	0.99 ± 0.44	1.00 ± 0.50	1.10 ± 0.52	0.98 ± 0.51
Nanning						
Outpatient patients	0.81 ± 0.56	0.88 ± 0.60	0.81 ± 0.60	0.80 ± 0.61	0.89 ± 0.65	0.71 ± 0.67
Hospitalization patients	1.03 ± 0.50	0.98 ± 0.51	1.06 ± 0.53	0.99 ± 0.57	1.12 ± 0.55	1.00 ± 0.63
Shanghai						
Doctors	0.56 ± 0.82	1.03 ± 0.74	0.38 ± 0.90	0.55 ± 0.93	0.66 ± 0.84	0.31 ± 0.99
Nurses	0.44 ± 0.59	0.94 ± 0.64	0.23 ± 0.76	0.34 ± 0.73	0.60 ± 0.62	0.18 ± 0.80
Technicians	0.64 ± 0.79	0.93 ± 0.74	0.60 ± 0.88	0.74 ± 0.81	0.72 ± 0.78	0.33 ± 1.01
Chongqing						
Doctors	- 0.07 ± 0.77	0.17 ± 0.75	- 0.16 ± 0.86	- 0.14 ± 0.92	0.25 ± 0.73	- 0.37 ± 0.90
Nurses	- 0.06 ± 0.76	0.24 ± 0.58	- 0.11 ± 0.85	- 0.18 ± 0.97	0.26 ± 0.79	- 0.39 ± 0.92
Technicians	0.08 ± 0.65	0.47 ± 0.44	0.03 ± 0.69	- 0.04 ± 0.77	0.23 ± 0.73	- 0.23 ± 0.83
Nanning						
Doctors	0.40 ± 0.69	0.45 ± 0.67	0.30 ± 0.73	0.41 ± 0.81	0.56 ± 0.75	0.30 ± 0.82
Nurses	0.36 ± 0.60	0.40 ± 0.67	0.32 ± 0.65	0.41 ± 0.65	0.52 ± 0.58	0.21 ± 0.77
Technicians	0.48 ± 0.44	0.44 ± 0.56	0.55 ± 0.48	0.46 ± 0.49	0.59 ± 0.44	0.37 ± 0.59

Table 4. One-way analysis of variance between the average values of the 5 dimensions of ServQual scales and patients in 3 infectious diseases hospitals

Dependent variable/Area	N	Mean	S.D.		SS	df	MS	F	Scheffe (C)
Tangibles								39.871***	A > BC
Shanghai (A)	501	1.19	0.537	Between Groups	23.182	2	11.591		
Chongqi (B)	159	0.87	0.463	Within Groups	378.223	1301	0.291		
Naning (C)	644	0.93	0.558	Total	401.406	1303			
Reliability								11.957***	A > C
Shanghai (A)	501	1.10	0.596	Between Groups	7.840	2	3.920		
Chongqi (B)	159	0.98	0.468	Within Groups	426.529	1301	0.328		
Naning (C)	644	0.93	0.577	Total	434.369	1303			
Assurance								5.249***	A > C
Shanghai (A)	501	1.13	0.652	Between Groups	3.998	2	1.999		
Chongqi (B)	159	1.09	0.521	Within Groups	495.456	1301	0.381		
Naning (C)	644	1.01	0.611	Total	499.454	1303			

***p < 0.001

Table 5. One-way analysis of variance between the average values of the 5 dimensions of ServQual scales and medical staffs in 3 infectious diseases hospitals

Dependent variable/Area	N	Mean	S.D.		SS	df	MS	F	Scheffe (C)
Tangibles								79.265***	A > BC; C > B
Shanghai (A)	291	0.96	0.696	Between Groups	68.834	2	34.417		
Chongqi (B)	179	0.27	0.606	Within Groups	368.639	849	0.434		
Naming (C)	382	0.42	0.654	Total	437.473	851			
Reliability								24.699***	AC > B
Shanghai (A)	291	0.38	0.846	Between Groups	28.818	2	14.409		
Chongqi (B)	179	-0.09	0.822	Within Groups	495.299	849	0.583		
Naming (C)	382	0.34	0.663	Total	524.117	851			
Responsiveness								42.161***	AC > B
Shanghai (A)	291	0.52	0.821	Between Groups	52.432	2	26.216		
Chongqi (B)	179	-0.14	0.916	Within Groups	527.914	849	0.622		
Naming (C)	382	0.42	0.693	Total	580.346	851			
Assurance								19.030***	AC > B
Shanghai (A)	291	0.65	0.725	Between Groups	18.153	2	9.076		
Chongqi (B)	179	0.25	0.757	Within Groups	404.930	849	0.477		
Naming (C)	382	0.55	0.628	Total	423.083	851			
Empathy								36.129***	AC > B
Shanghai (A)	291	0.26	0.915	Between Groups	51.906	2	25.953		
Chongqi (B)	179	-0.35	0.895	Within Groups	609.869	849	0.718		
Naming (C)	382	0.26	0.767	Total	661.775	851			

***p < 0.001

than that evaluated on only 2 dimensions in Shanghai hospitalization patients; Average value of medical staff group were 0.17-1.03, -0.16-0.60, -0.18-0.74, 0.23-0.72, and -0.39-0.37, respectively. Satisfaction of Medical staff in empathy, responsiveness, and reliability were low; satisfaction of Chongqing group were lower. The mean of 5 dimensions can be seen in Table 3.

3.4.4. One-way analysis of variance

One-way analysis of variance was performed between the average values of the 5 dimensions of the ServQual scale and patients and medical staff of Shanghai, Chongqing, and Nanning. The results are summarized in Tables 4 and 5.

The satisfaction for tangibles of Shanghai patients was higher than that of Chongqing and Nanning patients; the satisfaction for Reliability and Assurance

of Shanghai patients were higher than that of Nanning patients (Table 4).

From Table 5, we can see the satisfaction on 5 dimensions of Shanghai and Nanning medical staffs were higher than that of Chongqing's; and the satisfaction for tangibles of Shanghai medical staff was higher than that of Nanning's (Table 5).

4. Discussion

The medical staff showed lower levels of satisfaction than the patients. Empathy and responsiveness scores were relatively low for both medical staff and patients. Reliability scores were relatively low for the medical staff. Medical staff in general showed relatively low levels of satisfaction. When medical staffs show a negative attitude in dealing with patients, patients tend to develop biased perceptions of the medical treatment.

When thorough and effective communication between clinicians and patients are lacking, patient violence are bound to occur. This situation is compatible with the results from the research of Wen X, *et al.* (7).

4.1. *Improving the medical staff's and patients' perception of empathy*

Among the medical staff at the three hospitals, the scores on empathy were lowest among the five dimensions. This is different from that of Anbori A's report which showed high empathy, high reliability and high assurance. The different maybe due to the different aims in terms of quality service between public hospitals and private hospitals (23). The patients also showed relatively low levels of satisfaction on the dimension of empathy. Empathy refers to the service provider's ability to stand in the shoes of the customer and meet the customer's requirements (14). If the hospital fails to take the perspective of the medical staff, the medical staff would not be able to stand in the shoes of the patients when providing services. This situation will lead to frequent disputes between clinicians and patients (7-12).

4.2. *Improving the patients' experience with responsiveness*

At all three hospitals, patients showed low levels of satisfaction with responsiveness. Responsiveness refers to the service provider's initiative and intrinsic motivation to help the customer and provide convenient service (14). Although the level of medical expertise is directly related to patient satisfaction (36-38), patients are unlikely to attack the medical staff because of low satisfaction with the tangibles, but the improvement of tangibles is needed (29). However, patients may violently assault the clinicians when they repeatedly ask questions and seek help without getting satisfactory responses.

4.3. *Enhancing clinicians' perception of reliability*

The medical staff at all three hospitals showed low satisfaction with reliability. Reliability refers to service providers' ability to deliver the promised service in a precise and reliable manner. It can predict turnover of staff (14,23,39). Public hospitals in China have been forced into the market economy. Hospitals face multiple sources of pressure arising from evaluations of the facilities' credentials and the presidents' performance, medical insurance and competition within the industry. The hospitals pass on the performance requirements to various business units but lack the ability to fulfill their obligations to the medical staff. This situation has led to turnover of staff between different hospitals and outside of the medical care system. Many medical staff

members have stopped doing clinical work and left medical care facilities (9,10).

4.4. *Constantly improving the management of services delivered by the hospital operators*

Among the three hospitals, the medical staff and patients showed different levels of satisfaction. Shanghai's medical staff showed relatively good perception on the five dimensions. Patients in Shanghai showed relatively good perception on three dimensions. These results may be related to the local economic conditions. Shanghai enjoys geographical advantages in China. Its hospital operators are equipped with management concepts more similar to international standards, paying attention to satisfaction of both patients and medical staff. However, patients in Shanghai showed no difference from their counterparts in Chongqing and Nanning on responsiveness and empathy. Medical staff in Nanning fared better than those in Chongqing on the dimension of tangibles. Patients in Chongqing fared better than those in Nanning on empathy. This study shows that medical staff and patient satisfaction is related to the management concepts of hospital operators. Patient satisfaction is the source of customer satisfaction (25), management improvement can improve the quality of service (26). Hospital operators in Shanghai need to strengthen the education of medical staff on responsiveness and empathy to patients. Hospital operators in Nanning need to pay close attention to improve the medical staff's services to increase patient satisfaction. Hospital operators in Chongqing need to pay close attention to patients' needs and try their best to meet those needs. Thus, the criteria for medical staff and patient satisfaction developed in this study are suitable for Chinese hospitals. These criteria can reflect the management principles of different hospital operators.

4.5. *Improving the research method with satisfaction survey*

Hospitals in Shanghai conduct a Patient Satisfaction Survey through third-party agencies. At the end of each year the researchers survey 100-200 randomly-drawn respondents from the main questionnaire, the "Ten-Thousand-People Survey" to calculate patient satisfaction for the hospital over the entire year (2). This practice often causes discontent from the hospitals under evaluation. Based on the results of this study, we recommend that surveys on clinician and patient satisfaction should be conducted each quarter for each hospital using a variety of methods, such as over the phone, online, by mail and on-site. The assessors should first examine the homogeneity of samples and then analyze the data with professional statistical software. Results obtained this way may reflect clinician and

patient satisfaction with Chinese hospitals more closely and convincingly. Moreover, when a hospital conducts self-assessments, valid samples should be used for statistical analysis.

In conclusion, to improve satisfaction evaluation indicators of Chinese hospital medical staff and patients, and research methods, paying attention to the satisfaction of the medical staff will help to enhance the satisfaction of the medical staff and patients of China hospitals, and help to improve the China medical environment.

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Supplemental Data

Patients

- T1: A clean and comfortable environment for medical treatment.
 T2: Modern and advanced medical equipment.
 T3: Medical treatment clearly marked.
 T4: Doctors and nurses with neat and professional appearance.
 L5: The hospital ensures the doctors and nurses can be on time for duty.
 L6: The hospital is interested in solving medical problems.
 L7: The hospital is reliable.
 L8: The medical treatment processes are accurate and concise.
 L9: The documents or reports promised by the hospital can be delivered on time and clearly.
 S10: The hospital can satisfy the patients' immediate needs.
 S11: The hospital is willing to help the patients solve problems.
 S12: The hospital can timely process the patients' complaints.
 S13: The doctors and nurses can timely provide assistance to the patients even when they are busy.
 A14: The doctors and nurses are reliable.
 A15: The patients feel at ease in the treatment process.
 A16: The doctors and nurses are polite to the patients.
 A17: The doctors and nurses have enough professional knowledge to answer the patients' questions.
 E18: The doctors and nurses can show concern for each patient.
 E19: The doctors and nurses can provide personalized care to patients.
 E20: The doctors and nurses know the patients' needs.
 E21: The hospital considers the patients' interests first.
 E22: The hospital pays attention to the medical needs of the patients.

Medical Staff

- T1: A clean and comfortable work environment.
 T2: Modern and advanced work equipment.
 T3: Office area clearly marked.
 T4: Staff with neat and professional appearance.
 L5: The staff working time and intensity are appropriate.
 L6: The hospital is interested in solving the problems at work.
 L7: The hospital is reliable.
 L8: The working processes are clear and concise.
 L9: The welfare benefits promised by the hospital can be realized.
 S10: The hospital can satisfy the staff's working needs.
 S11: The hospital is willing to help the staff to solve working problems.
 S12: The hospital can timely process the staff's complaints.
 S13: The hospital can process the staff's major and unexpected events actively.
 A14: The hospital is reliable.
 A15: The staff feel comfortable at work.
 A16: The staff are friendly and polite to each other.
 A17: The hospital pays attention to the training of the staff's professional knowledge and skills.
 E18: The hospital can show concern for each staff member.
 E19: The hospital can give personalized care to staff.
 E20: The hospital knows the staff's needs.
 E21: The hospital pays attention to the staff's interests.
 E22: The hospital pays attention to the needs of the staff.