

Article

# Consumer satisfaction with tertiary healthcare in China: findings from the 2015 China National Patient Survey

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## Abstract

**Objective:** This study aims to develop understanding of Chinese patient satisfaction with tertiary hospitals.

**Design:** The study draws on data collected from the 2015 China National Patient Survey. A Likert five-point scale was used to formulate the questionnaires. Descriptive analysis and logistic regression analysis were conducted.

**Setting:** A structured questionnaire was used by 1432 interviewers to interview 27 475 outpatients and 19 938 inpatients in 136 tertiary hospitals from 31 provinces.

**Participants:** Outpatients in the dispensing area and inpatients in the discharging area were randomly interviewed.

**Main Outcome Measure(s):** Key domains of the questionnaire include the layout of service functions, environment maintenance, process management, quality of care, humane care and the patient–doctor relationship. Within each domain, several indicators were set, and each indicator was given a statement.

**Results:** The overall satisfaction scores are  $4.42 \pm 0.68$  and  $4.67 \pm 0.62$  for outpatient and inpatient, respectively. The domains with highest satisfaction are 'diagnosis and treatment' for outpatient and 'nursing care' for inpatient. Outpatients were least satisfied with long waiting time, while inpatients were least satisfied with the food. The strongest predictor of overall satisfaction appears to be 'patient–doctor relationship' for both outpatients (OR = 3.53, 95% CI: 3.17–3.92) and inpatients (OR = 7.34, 95% CI: 5.55–9.70).

**Conclusions:** Chinese hospitals need to pay more attention to offering more humane care to patients, hospital environment and process management improvement, reducing waiting times for seeing doctors and outpatient testing, and improving amenity services such as better food in the wards.

**Key words:** patient satisfaction, national survey, tertiary hospital, China

## Introduction

A flawed health system in China has contributed to a patient–doctor relationship associated with mistrust and even conflict [1–4]. Goals of national health reform include strengthening primary care toward creating an integrated health service delivery system, and improving the benefit package of the basic health insurance programs, among others, these goals aim to address the expense and difficulty of seeking medical service, and relieving the tensions between patients and doctors. The government has also increasingly realized that a functioning health system should respond appropriately to patients' expectations [5, 6], with patient experience and consumer satisfaction as important measures of health system performance.

The Chinese government has tried to implement reforms to improve healthcare and raise patient satisfaction [7–9]. A full range of healthcare improvement requirements were established in 2015 designed to give patients a tangible sense of improvement in the health system, including promoting service appointment system, optimizing ward structure and enhancing health information system to improve patient hospital experience, and harmonizing the patient–doctor relationship in order to regain patient trust.

At the end of 2015, 1 year after the implementation of the national healthcare improvement initiative, Peking Union Medical College (PUMC) School of Public Health was commissioned as a third party academic institution to evaluate the above initiative. This paper records and analyzes the patient survey with the goal to identify key determinants of overall patient satisfaction. Additionally, the paper aims to develop a comprehensive understanding of Chinese patient satisfaction with healthcare services, to produce evidence for the government to target critical areas for further healthcare improvement, and to promote better harmonization of the patient–doctor relationship. It is also an important indication of the extent to which China's health system reform programs have been successful or not. Increasing attention has been paid to measure structural and process quality of healthcare in China, but there has been a lack of rigorous measures on outcome indicators, including patient satisfaction. This study helps to fill this important information gap, and serve as the future reference point for time-series study to implement potential quality improvement initiatives.

## Methods

### Study design

A Likert five-point scale was used to formulate the questionnaires as a valid tool. The questionnaire was developed based on the implementation strategy of the healthcare improvement initiative [10] and relevant studies about questionnaire design for patient surveys [11–19]. Key domains of the healthcare improvement initiative were included in the questionnaire, covering the layout of service functions, environment maintenance, process management, quality of care, humane care and the patient–doctor relationship. Within each domain, several indicators were set, and each indicator was given a statement. Patients were asked to rate their feelings of each statement with 'strongly agree,' 'agree,' 'neither agree nor disagree,' 'disagree' or 'strongly disagree,' with 5, 4, 3, 2 and 1 assigned to each scale, respectively. We carried out a rigorous and multi-faceted scientific process to develop and validate the reliability, feasibility and acceptability of the questionnaire, including literature review, patients' cognitive interviews, stakeholder (healthcare regulator, hospital manager, doctor, nurse and patient) input, pilot tests in three provinces, psychometric

analyses, small-scale multi-disciplinary expert consultations and field tests. The feasibility and acceptability of the tool were examined by the percentage of missing item responses, interviewer-reported acceptability, and the time and ease of administration. The internal consistency and reliability of each dimension was examined by the Cronbach's  $\alpha$  and inter-subscale correlations. Full questionnaires for both outpatient and inpatient surveys are presented in Annex 1 and 2. Satisfaction was measured by the mean score of all responses for each indicator and each domain. The questionnaires were set in a social network platform (Wechat), and linked with a public account: 'Healthy China' owned by the government. A total of 1432 pre-trained medical students used mobile devices and conducted face-to-face interviews in sample hospitals. To secure the quality of interview, only those students who have prior survey experiences were recruited as interviewers by the provincial leading experts (who have sufficient experiences in social sciences surveys), and all were trained with a national standardized manual developed by PUMC. Only fully completed questionnaires could be submitted online successfully. Otherwise the online system will give alerts of the missing items. To ensure traceability, mobile phone numbers of all recruited interviewers were pre-recorded in the system before the survey. Only system identified interviewers could conduct the interviews. To preserve confidentiality of the respondents, questionnaire was anonymously submitted by patients. The survey protocol was reviewed and approved by the Research Ethics Committee of PUMC.

### Population and setting

The survey was conducted in 136 tertiary hospitals across 31 provinces. In each province, one provincial general hospital, one provincial traditional Chinese medicine hospital and one maternal and child health hospital were selected. Another 43 National Health and Family Planning Commission (NHFPC) hospitals (including 28 general hospitals and 15 specialist hospitals) were also selected for the survey. Outpatients in the dispensing area and inpatients in the discharging area were randomly interviewed. For pediatric patients, their parents responded on their behalf.

### Sample size

We suppose that 85% of outpatients and 90% of inpatients were satisfied with the hospital service, and set the significance level at 0.05, to calculate the minimum sample sizes for outpatients and inpatients, which are 196 and 138, respectively. The sample sizes were set as 200 for outpatients and 150 for inpatients in each sample hospital, so the planned sample size in 136 sample hospitals was 47 600 in total. The actual number of patients interviewed was 62 000, based on the reported response rates of outpatients and inpatients survey (~90% and 70%, respectively), the number of completed questionnaires was 47 413 in total.

### Statistical analysis

Before doing data analysis, we cleaned the data which were not logical in terms of relationship between demographic and social characteristics. SPSS 22.0 was used to: (i) test the internal consistency and reliability of the questionnaire and each domain with Cronbach's  $\alpha$ ; (ii) conduct Spearman correlation analysis between the satisfaction score of each indicator and overall satisfaction score; (iii) conduct multivariate binary logistic regression analysis to identify factors associated with overall outpatient and inpatient

satisfaction. We define ‘strongly agree’ and ‘agree’ as positive answer (1 = yes); ‘neither agree nor disagree,’ ‘disagree’ and ‘strongly disagree’ were defined as ‘negative answer (0 = no).’ *P* value of <0.05 was considered to be statistically significant.

For the multivariate binary logistic regression analysis, all domains for healthcare improvement were considered as independent variables controlling for key confounders. Based on former patient surveys in Chinese tertiary hospital settings, [18–21] we chose changeable demographic, geographic and social characteristics (health insurance program, type of hospital, local patient, referral and counter registration approach) as the key confounders, and included them into the regression model together with the domains.

## Results

The Cronbach’s  $\alpha$  of the questionnaires are 0.9489 for outpatient and 0.9620 for inpatient. As both values are >0.7, this is a positive indicator of internal consistency within each domain and the acceptable reliability of the questionnaires. A total of 47 413 complete questionnaires were retrieved, among which 27 475 were from outpatient, and 19 938 were from inpatients. Selected demographic, geographic and social profiles of sample patients are presented in Annex 3 and 4. About 68% and 60% of outpatient and inpatient respondents were female. Respondents aged between 20 and 39 accounted 56% of the outpatient respondents, and inpatient respondents were uniformly distributed between 20 and 69 age groups, the proportion of each specific age group ranged from 15 to 20%. As Tables 1 and 2 shows, the overall satisfaction mean scores are  $4.42 \pm 0.68$  and  $4.67 \pm 0.62$  for outpatient and inpatient, respectively. The most satisfied domains are ‘diagnosis and treatment’ for outpatient and ‘nursing care’ for inpatient. Both overall outpatient satisfaction and overall inpatient satisfaction have the highest Spearman correlation with the indicator of ‘most medical staffs are trustful.’ Figure 1 shows the mean outpatient and inpatient satisfaction scores of all indicators. Outpatient users of ambulatory services were least satisfied with long waiting times, while inpatients were least satisfied with the food.

The results of the logistic regression analysis (Tables 3 and 4) show that hospital environment, process management, healthcare experience and patient–doctor relationship have significant strong correlations with both outpatient satisfaction, while ward environment, diagnosis and treatment, and patient–doctor relationship have significant strong correlation with inpatient satisfaction. The domain of ‘patient–doctor relationship’ for healthcare improvement is the strongest predictor of overall patient satisfaction (OR = 3.19, 95% CI: 2.83–3.59 in outpatient settings, OR = 6.46, 95% CI: 3.90–10.69 in inpatient settings, *P* < 0.05). Additionally, the domains of ‘healthcare experience,’ ‘hospital environment’ and ‘process management’ for outpatient and the domain of ‘diagnosis and treatment’ for inpatient are also strong predictors of overall patient satisfaction (OR > 1, *P* < 0.05). The domain of ‘ward environment’ has a negative B and its OR = 0.58, which means that ‘good ward environment’ may raise ~1.8 times higher inpatient satisfaction.

As for the demographic, geographic and social determinants of overall patient satisfaction, among outpatients, commercial insurance coverage is associated with satisfaction that is 1.73 times that of the uninsured (*P* = 0.03). Specialist hospitals are less likely to have higher outpatient satisfaction compared with general hospitals—the outpatient satisfaction of general hospitals is 1.3 times of that specialist hospitals (*P* < 0.05). Geographic location of hospitals and patients,

registration and referral have no statistically significant correlation with the overall patient satisfaction.

## Discussion

As this is the first national on-site patient survey, we were not able to conduct a time-series study. However, we still identified some relevant surveys to make a comparison. Although none of them is totally matched with the 2015 China national survey in terms of survey tools and survey strategies, and rating tendency is likely to differ when comparing populations displaying important cultural differences [22], the comparison may still give the readers some insights. Compared to the results of the 2013 National Health Service Survey (a household survey through a retrospective satisfaction review of residents about the healthcare services they accessed during the prior 2 weeks before the survey, where 67.2% respondents were satisfied with the inpatient services they received during the past year) [23], the satisfaction rate found from our study is higher. Further, this satisfaction rate is on par with the that in many industrialized countries (ranging between 67.5% respondents satisfied quoted from the Japanese Ministry of Health, Labor and Welfare 2014 survey, to 71% respondents scored above 8 out of 10 quoted from the US’ Hospital Consumer Assessment of Healthcare Providers and Systems 2015 survey, and to 84% respondents scored above 6 out of 10 quoted from UK’s National Health Service 2014 survey) [24–29]. The findings of this study are consistent with many satisfaction surveys done in many different countries, it does add to the literature that the Chinese population is similar to other populations in its assessments of hospital care. According to our survey, the most concerning issue for Chinese patients seeking healthcare is ‘medical technology.’ It could be reasonably expected that patient satisfaction should be high in the sample hospitals which are all top tertiary hospitals across the country, which is in line with our findings. The most satisfied domains and indicators are ‘diagnosis and treatment,’ ‘nursing care,’ ‘check information before medical operations,’ which are all related to medical care. The least satisfied domains and indicators (‘waiting time for tests’ and ‘hospital dietary’) are all related to non-medical care. This implies that Chinese hospitals need to pay more attention to non-medical care, and offer more humane care to patients, which will help increase overall patient satisfaction.

The univariate analysis of the overall patient satisfaction shows that, satisfaction with the indicator ‘most medical staffs are trustful’ correlates most with overall patient satisfaction. This implies that building better patient–doctor relationship will greatly contribute to increasing overall patient satisfaction. The same result was found from the multivariate analysis, which is that the dimension of ‘patient–doctor relationship’ is the strongest predictor of overall patient satisfaction. Other dimensions like ‘hospital environment,’ ‘process management’ and ‘healthcare experiences’ for outpatient and ‘diagnosis and treatment’ for inpatient also have a strong association with patient satisfaction. This implies that improvement in these domains and respective indicators are critical for raising overall patient satisfaction. To raise outpatient satisfaction, more efforts are needed in improving environment and process, while improvements in diagnosis and treatment are needed to raise inpatient satisfaction.

Respondents covered by private health insurance programs are likely to have higher outpatient satisfaction than uninsured respondents. Studies in high incoming countries show that, where there was no evidence that the association between overall satisfaction and those with or without private insurance [30]. This could be

**Table 1** Outpatient satisfaction characteristics

Questionnaire		Likert 5 scale of patient satisfaction					Mean satisfaction score	SD	Spearman correlation with satisfaction	Domain satisfaction score	Cronbach's $\alpha$
Domain	Indicator	Strongly disagree N (%)	Disagree N (%)	Neither agree nor disagree N (%)	Agree N (%)	Strongly agree N (%)					
Hospital environment	1. Clear instructions	40 (0.15)	179 (0.65)	1922 (7.00)	9337 (33.98)	15 997 (58.22)	4.49	0.6682	0.5026	4.38	0.8442
	2. Medical staff provide guidance and explanation	84 (0.31)	238 (0.87)	2201 (8.01)	9311 (33.89)	15 641 (56.93)	4.46	0.7053	0.5192		
	3. The toilet is clean and convenient	148 (0.54)	568 (2.07)	3941 (14.34)	9150 (33.30)	13 668 (49.75)	4.30	0.8272	0.4681		
	4. Non-smoking	57 (0.21)	231 (0.84)	1381 (5.03)	8090 (29.44)	17 716 (64.48)	<b>4.57</b>	0.6487	0.4298		
	5. The elevator is safety and convenient	146 (0.53)	590 (2.15)	3144 (11.44)	8862 (32.25)	14 733 (53.62)	4.36	0.8079	0.4644		
	6. Enough seats are provided in the waiting area	223 (0.81)	1123 (4.09)	3594 (13.08)	8837 (32.16)	13 698 (49.86)	4.26	0.8930	0.4701		
Process management	7. Drinking water is provided	260 (0.95)	1131 (4.12)	4594 (16.72)	8018 (29.18)	13 472 (49.03)	4.21	0.9286	0.4712	4.15	0.8723
	8. The waiting time for counter registration is acceptable	267 (0.97)	803 (2.92)	4126 (15.02)	1055 (38.41)	11 726 (42.68)	4.19	0.8635	0.5048		
	9. The waiting time until consultation is acceptable	396 (1.44)	1255 (4.57)	5044 (18.36)	10 585 (38.53)	10 195 (37.11)	4.05	0.9297	0.5249		
	10. There is enough time to communicate with doctors	217 (0.79)	805 (2.93)	4231 (15.40)	10 388 (37.81)	11 834 (43.07)	4.19	0.8574	0.5608		
	11. The waiting time for test is acceptable	292 (1.06)	965 (3.51)	6222 (22.65)	9993 (36.37)	10 003 (36.41)	<b>4.04</b>	0.9085	0.5172		
	12. The waiting time for making payment is acceptable	123 (0.45)	445 (1.62)	3521 (12.82)	11 076 (40.31)	12 310 (44.80)	4.27	0.7786	0.5107		
Healthcare experience	13. It is convenient to make appointment	164 (0.60)	417 (1.52)	3826 (13.93)	8593 (31.28)	14 475 (52.68)	4.34	0.8157	0.5152	4.34	0.8163
	14. There are multiple and convenient payment methods	126 (0.46)	463 (1.69)	4135 (15.05)	8558 (31.15)	14 193 (51.66)	4.32	0.8211	0.5018		
	15. The self-service devices reduce waiting time	84 (0.31)	349 (1.27)	3904 (14.21)	8175 (29.75)	14 963 (54.46)	4.37	0.7935	0.4942		
Diagnosis and treatment	16. The medical staff ask about illness development patiently	108 (0.39)	376 (1.37)	2507 (9.12)	9211 (33.53)	15 273 (55.59)	4.43	0.7458	0.6178	<b>4.39</b>	0.8895
	17. The medical staff advise diagnosis and treatment plan patiently	118 (0.43)	424 (1.54)	2732 (9.94)	9199 (33.48)	15 002 (54.60)	4.40	0.7639	0.6162		
	18. I feel that I'm respected by the medical staff	116 (0.42)	373 (1.36)	2668 (9.71)	9336 (33.98)	14 982 (54.53)	4.41	0.7536	0.6463		
	19. I feel that I'm protected with personal privacy	116 (0.42)	367 (1.34)	2903 (10.57)	9479 (34.50)	14 610 (53.18)	4.39	0.7611	0.6036		
Patient-doctor relationship	20. The medical expenditure is reasonable	133 (0.48)	534 (1.94)	3140 (11.43)	9705 (35.32)	13 963 (50.82)	4.34	0.7924	0.6348	4.34	0.7601
	21. There is a clear and reliable mechanism and channel for praise and complain	154 (0.56)	466 (1.70)	5360 (19.51)	8563 (31.17)	12 932 (47.07)	4.22	0.8565	0.6382		
	22. Most of the medical staff is trustful	71 (0.26)	192 (0.70)	1999 (7.28)	9979 (36.32)	15 234 (55.45)	4.46	0.6833	<b>0.7023</b>		
	23. Overall satisfaction to outpatient care	55 (0.20)	173 (0.63)	2141 (7.79)	10 959 (39.89)	14 147 (51.49)	4.42	0.6790			

Bold and italic values represent the highest indicator satisfaction score in each domain, and the highest domain satisfaction score.

**Table 2** Inpatient satisfaction characteristics

Questionnaire		Likert 5 scale of patient satisfaction					Mean satisfaction score	SD	Spearman correlation with satisfaction	Domain satisfaction score	Cronbach's $\alpha$ of domains
Domain	Indicator	Strongly disagree N (%)	Disagree N (%)	Neither agree nor disagree N (%)	Agree N (%)	Strongly agree N (%)					
Process Management	1. Admission procedure is convenient	100 (0.50)	165 (0.83)	785 (3.94)	4605 (23.10)	14 283 (71.64)	4.64	0.6618	0.5763	4.65	0.8398
	2. The medical staff provide guidance and explanation	99 (0.50)	165 (0.83)	682 (3.42)	4410 (22.12)	14 582 (73.14)	4.66	0.6490	0.6014		
Ward environment	3. Ward environment is quiet	257 (1.29)	187 (0.94)	1703 (8.54)	4636 (23.25)	13 155 (65.98)	4.52	0.7812	0.5661	4.40	0.7256
	4. Hospital dietary is quality secured	436 (2.19)	237 (1.19)	3736 (18.74)	4607 (23.11)	10 922 (54.78)	4.28	0.9223	0.5280		
Nursing care	5. Nurses response in a timely manner	71 (0.36)	174 (0.87)	510 (2.56)	3663 (18.37)	15 520 (77.84)	4.72	0.6157	0.6148	<b>4.67</b>	0.8981
	6. Professional skills	68 (0.34)	170 (0.85)	517 (2.59)	3732 (18.72)	15 451 (77.50)	4.72	0.6146	0.6124		
	7. Courtesy	69 (0.35)	166 (0.83)	501 (2.51)	3259 (16.35)	15 943 (79.96)	4.74	0.6017	0.6087		
	8. I know my nurse in charge	139 (0.70)	184 (0.92)	823 (4.13)	3477 (17.44)	15 315 (76.81)	4.69	0.6714	0.5807		
	9. I'm pleased with the services of nursing attendants	117 (0.59)	170 (0.85)	2749 (13.79)	3420 (17.15)	13 482 (67.62)	4.50	0.8144	0.5471		
Diagnosis and treatment	10. Doctors ask about illness development patiently.	63 (0.32)	163 (0.82)	447 (2.24)	3448 (17.29)	15 817 (79.33)	4.74	0.5952	0.6085	4.47	0.9399
	11. The medical staff brief me diagnosis and treatment plan patiently	101 (0.51)	165 (0.83)	600 (3.01)	3637 (18.24)	15 435 (77.41)	4.71	0.6294	0.6297		
	12. I know my doctor in charge	72 (0.36)	164 (0.82)	494 (2.48)	3263 (16.37)	15 945 (79.97)	4.74	0.6007	0.5840		
	13. The medical staff wash their hands before medical operations	91 (0.46)	161 (0.81)	1403 (7.04)	3743 (18.77)	14 540 (72.93)	4.63	0.7066	0.6059		
	14. The medical staff check information before medical operations	44 (0.22)	159 (0.80)	357 (1.79)	3276 (16.43)	16 102 (80.76)	4.76	0.5714	0.5970		
	15. I feel that I'm respected by the medical staff	83 (0.42)	172 (0.86)	563 (2.82)	3837 (19.24)	15 283 (76.65)	4.70	0.6272	0.6515		
	16. I feel that I'm protected with personal privacy	102 (0.51)	168 (0.84)	829 (4.16)	4055 (20.34)	14 784 (74.15)	4.66	0.6618	0.6440		
Patient–doctor relationship	17. The medical expenditure is reasonable	274 (1.37)	204 (1.02)	1877 (9.41)	4496 (22.55)	13 087 (65.64)	4.50	0.8022	0.6439	4.60	0.7683
	18. There is a clear and reliable mechanism and channel for praise and complain	166 (0.83)	166 (0.83)	2454 (12.31)	3969 (19.91)	13 183 (66.12)	4.50	0.8038	0.6336		
	19. Most of the medical staff are trustful	63 (0.32)	154 (0.77)	472 (2.37)	4104 (20.58)	15 145 (75.96)	4.71	0.6053	<b>0.6891</b>		
	20. Overall inpatient satisfaction	63 (0.32)	165 (0.83)	526 (2.64)	4581 (22.98)	14603 (73.24)	4.67	0.6249			

Bold and italic values represent the highest indicator satisfaction score in each domain, and the highest domain satisfaction score.

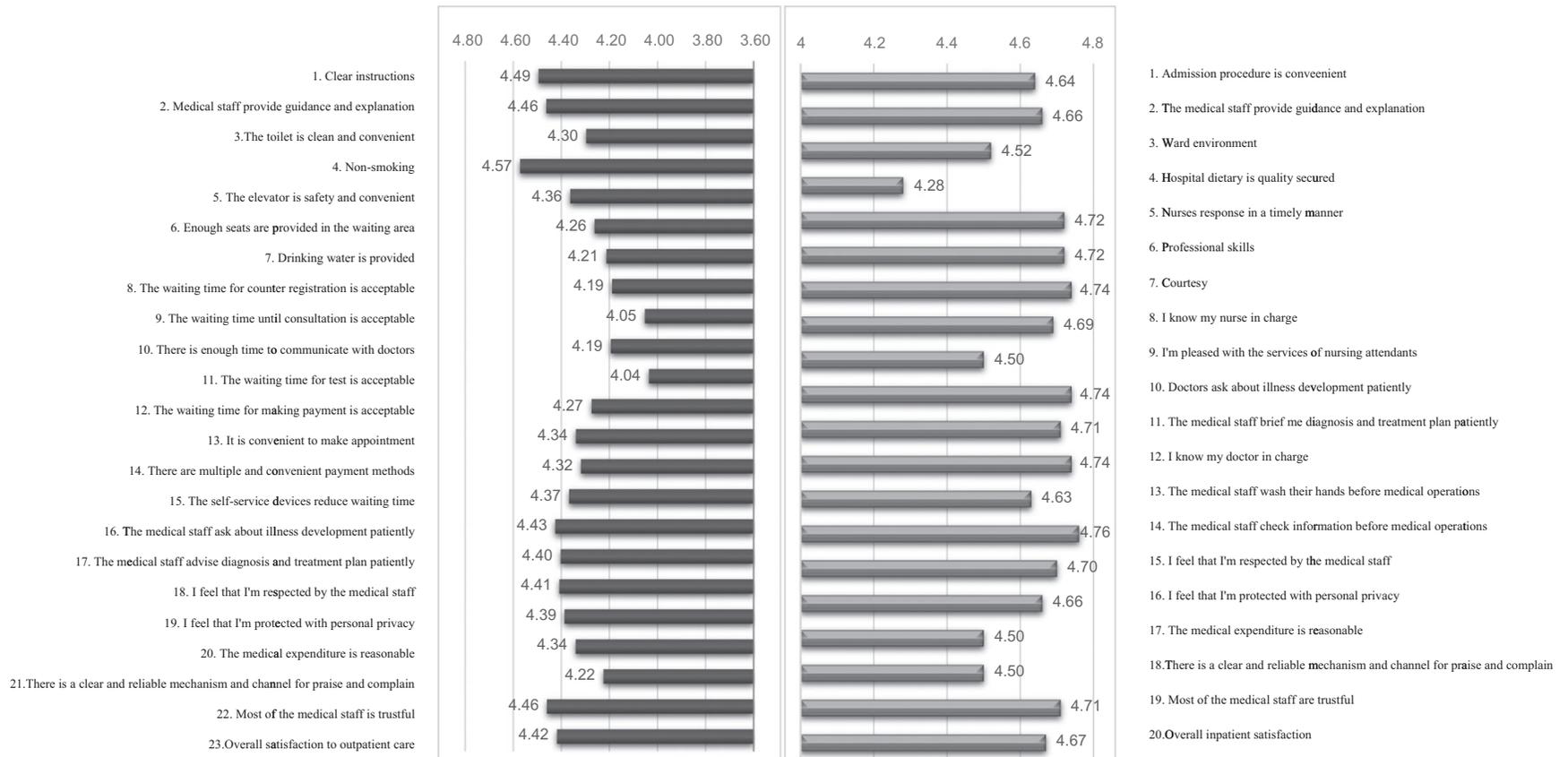


Figure 1 Mean outpatient and inpatient satisfaction score.

**Table 3** Logistic regression analysis of the key determinants of overall outpatient satisfaction

	B	SE	P	OR	95% CI for OR	
					Lower	Upper
Region (as compared with East)			0.15			
Region (Middle)	0.09	0.06	0.15	1.09	0.97	1.23
Region (West)	-0.05	0.07	0.51	0.95	0.83	1.10
Type of hospital (as compared with general hospital)			0.00			
Type of hospital (Traditional Chinese medicine hospital)	0.14	0.07	0.06	1.15	0.99	1.33
Type of hospital (Specialist hospital)	-0.24	0.06	<b>0.00</b>	0.79	0.70	0.89
Health insurance program (as compared with uninsured and others)			0.12			
Health insurance program (Government employee)	0.12	0.11	0.29	1.13	0.90	1.41
Health insurance program (Urban employee)	0.10	0.08	0.21	1.10	0.95	1.28
Health insurance program (Urban and rural resident)	0.08	0.09	0.33	1.09	0.92	1.29
Health insurance program (New cooperative medical scheme)	-0.06	0.09	0.53	0.95	0.79	1.13
Health insurance program (Private)	0.55	0.25	<b>0.03</b>	<b>1.73</b>	1.06	2.81
Counter registration approach (as compared with appointment approach)	-0.40	0.39	0.30	0.67	0.31	1.44
Local patient (as compared with non-local patient)	0.03	0.06	0.62	1.03	0.91	1.17
Referral patient (as compared with non-referral patient)	-0.004	0.06	0.95	1.00	0.88	1.13
Domains for healthcare improvement						
Hospital environment	0.42	0.13	<b>0.00</b>	<b>1.53</b>	1.20	1.95
Process management	0.38	0.06	<b>0.00</b>	<b>1.46</b>	1.30	1.64
Healthcare experience	0.72	0.05	<b>0.00</b>	<b>2.05</b>	1.85	2.27
Diagnosis and treatment	0.07	0.05	0.11	1.08	0.98	1.18
Patient-doctor relationship	1.16	0.06	<b>0.00</b>	<b>3.19</b>	2.83	3.59

Bold *P* values <0.05, bold ORs>1.

**Table 4** Logistic regression analysis of the key determinants of overall inpatient satisfaction

	B	SE	P	OR	95% CI for OR	
					Lower	Upper
Region (as compared with West)			0.24			
Region (East)	0.53	0.35	0.13	1.69	0.86	3.33
Region (Middle)	0.44	0.40	0.27	1.56	0.71	3.42
Type of hospital (as compared with General hospital)			0.30			
Type of hospital (Traditional Chinese medicine hospital)	-0.20	0.39	0.60	0.82	0.38	1.75
Type of hospital (Specialist hospital)	-0.52	0.34	0.13	0.59	0.30	1.16
Health insurance program (as compared with uninsured and others)			0.81			
Health insurance program (Government employee)	-0.74	0.77	0.35	0.48	0.11	2.14
Health insurance program (Urban employee)	-0.61	0.55	0.27	0.54	0.18	1.61
Health insurance program (Urban and rural resident)	-0.61	0.56	0.27	0.54	0.18	1.62
Health insurance program (New cooperative medical scheme)	-0.54	0.56	0.34	0.58	0.19	1.76
Health insurance program (Private)	-1.49	1.16	0.20	0.23	0.02	2.19
Referral patient (as compared with non-referral patient)	0.13	0.38	0.74	1.14	0.54	2.40
Local patient (as compared with non-local patient)	0.35	0.32	0.28	1.41	0.75	2.65
Domains for healthcare improvement						
Process Management	0.41	0.23	0.08	1.51	0.96	2.37
Ward environment	-0.55	0.23	<b>0.02</b>	<b>0.58</b>	0.37	0.91
Nursing care	0.27	0.31	0.39	1.31	0.71	2.41
Diagnosis and treatment	1.37	0.39	<b>0.00</b>	<b>3.92</b>	1.82	8.46
Patient-doctor relationship	1.86	0.26	<b>0.00</b>	<b>6.46</b>	3.90	10.69

Bold *P* values <0.05, bold ORs>1.

explained that, in the health systems where universal health coverage has well achieved with good benefit packages, private health insurance program may not be so important to affect the overall patient satisfaction. While in China, private health insurance program is a supplementary program only for the affluent population, the beneficiaries of private health insurance programs always have better risk protection than the others, insurance coverage and financial risk protection seem critical for raising patient satisfaction.

The geographic locations of hospitals and patients, registration and referral have no statistically significant correlations with overall patient satisfaction. It would appear these are less critical factors compared to healthcare improvement domains. Social and economic development does not secure higher patient satisfaction. The current healthcare service delivery system is not yet mature enough to formulate an efficient integrated healthcare system, which is supported by an appropriate referral system, encouraging use of primary care or registration in advance of visiting a hospital, among other likely options.

There are several limitations of our study. First, the questionnaires were developed specifically for the evaluation of the National Health Care Improvement Initiative, with many contents tailor made, and may not be a comprehensive survey for quality of care. Secondly, the interview was conducted in hospitals through face-to-face interviews, where patients were asked to respond to the questionnaire with mobile facilities on-site. Although we indicated to respondents on their questionnaires that answers would be submitted online, immediately, to a third party database without being disclosed to their hospitals, patients might still have felt compelled to indicate higher satisfaction ratings with healthcare services while they were still actively in care or due to time constraints, and this may bring bias in answering the questionnaire, especially for questions like ‘most medical staff are trustful,’ etc. Although we understand that leaving patients sufficient free time to complete the survey after leaving the hospital maybe helpful to address this limitation, considering the low response rates of off-hospital patients, and huge gaps in terms of level of education and cognitive ability of the respondents, we choose the in-hospital face-to-face interview approach. This approach was mostly adopted by patient surveys in developing countries which face the same problems as mentioned above [14–16, 18, 19]. To validate to what extent this affects the result we will conduct parallel face-to-face and anonymously written interviews in the next survey. Thirdly, although at least three hospitals from each province were targeted as sample hospitals, they are only a small proportion of the total numbers of hospitals in each province (except Beijing, Shanghai, Guangzhou and Chengdu), with all of those hospitals being top teaching hospitals. Our survey found that the most concerning issue for patients seeking healthcare is ‘medical technology,’ yet overall satisfaction with this may be higher in the top tertiary teaching hospitals included in our survey than hospitals in other settings. Fourthly, the survey was conducted in January just before the Chinese Year, when Chinese patients generally prefer not to go to hospital for non-emergent cases. Future surveys may need to choose other times to avoid this potential timing bias. Lastly, the survey interviewed 68% women in the outpatient setting and 60% in inpatient setting, and respondents aged between 20 and 39 accounted 56% of the outpatient respondents. When the population of the country is closer to 49% women and 33% between 20 and 49 years old [31, 32], our on-site, face-to-face survey strategy might may not accurately represent the entire cross-section of the national population.

## Conclusion

The findings of this study are consistent with the many satisfaction surveys done in many different countries. This study does add to the literature that the Chinese population is similar to other populations in its assessments of hospital care. The overall healthcare satisfaction rate in our study is already quite favorable, but satisfaction scores can still be improved. Judging by the reasons given by patients in making their hospital choices, as well as expressed low rate of satisfaction with certain aspects of healthcare, there are key aspects of healthcare that policy makers and hospital administrators need to pay more attention to offering more humane care to patients, hospital environment and process management improvement, reducing waiting times for seeing doctors and outpatient testing, and improving amenity services such as better food in the wards. All these areas are critical for the next stage of the National Health Care Improvement Initiative in China. The key findings from this paper are observations of patient satisfaction at tertiary hospitals in China

in 2015, which could be served as the baseline data for future quality improvement initiatives.

## Supplementary material

Supplementary material is available at *International Journal for Quality in Health Care* online.

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## Conflicts of Interest statement

All authors declare no conflict of interests. The funding organization was not involved in the study design, data analysis and interpretation, writing of the report and making the decision to submit the paper to *Int J Qual Health Care* for publication. We confirm that we have full access to all the data in the study, and had final responsibility for the decision to submit for publication.

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