

# How Perceived Quality of Care Affects Outpatient Satisfaction in China: A Cross-Sectional Study of 136 Tertiary Hospitals

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## Abstract

Public hospitals are integral components of China's health care system, and improving quality of care and patient satisfaction has become of greater concern for these hospitals. The aim of this study was to assess outpatient satisfaction with tertiary hospitals and to explore the roles played by patient perceptions of specific aspects of care in overall satisfaction. We designed a questionnaire to assess patient satisfaction and perceived quality of care using a 5-point Likert scale. The survey was conducted in 136 hospitals across 31 provinces of China, and a total of 28 822 patients were interviewed. For statistical analysis, we conducted descriptive analysis, nonparameter tests, Spearman's rank correlation, and multivariate logistic regression. Stepwise logistic regression identified 12 variables of patient perception associated with overall satisfaction. Patients' perception of physicians' technical skills had the strongest association with satisfaction, followed by inquiries into medical history/current situation and availability of elevators. Other determinants included a feeling of respect, timely guidance when needed, and explanation of treatments and medications. Waiting times and hospital environment factors, such as cleanliness of bathrooms and drinking water supply, were also associated with patient satisfaction in a slightly less powerful way. This study revealed that Chinese outpatient satisfaction with tertiary hospitals was relatively high. As determinants of satisfaction, patients valued professional medical care and respect from the medical staff more than nonmedical aspects of care. This implied that Chinese hospitals should ensure quality of medical care and sufficient communication with patients, as well as pay more attention to humanism in health care. In the meantime, improvements should be made to nonmedical aspects of care, especially waiting times and physical environment. These findings are also useful for the rest of the low- and middle-income world in improving patient satisfaction.

## Keywords

patient satisfaction, tertiary hospitals, outpatients, perceived quality of care, surveys and questionnaires, logistic models, China

### What do we already know about this topic?

Patient satisfaction is affected by demographic as well as care-related factors, including medical and nonmedical aspects of care. Factors such as waiting time, interpersonal interaction, and technical competence of providers have been explored in many countries.

### How does your research contribute to the field?

This study identified the effect of care-related factors on satisfaction, which filled in the research gap for China on this subject with results comparable to similar studies in other countries. It adds value to the global research community in studying the subjectively measured care-related characteristics and satisfaction in low- and middle-income countries.

### What are your research's implications toward theory, practice, or policy?

This study finds that Chinese patients value professional medical care and respect from the medical staff more than nonmedical aspects of care in tertiary hospitals, implying Chinese hospitals should ensure quality of medical care and sufficient communication with patients, as well as reduce waiting time and improve physical environment to acquire higher patient satisfaction. The findings are also useful for the rest of low- and middle-income world in improving patient satisfaction.



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## Background

Public hospitals are the backbone of the Chinese health care system. In 2005–2018, public hospitals accounted for more than 85% of hospital visits annually and about half of total health expenditures in China.<sup>1</sup> Although they offer the best health professionals and advanced equipment, they have long been criticized for having unpleasant environments, long waiting times, and poor service.<sup>2</sup> In 2009, China initiated a major health care system reform focusing on universal health insurance coverage, essential drug list, and a public health care delivery system.<sup>3</sup> As a critical and fundamental part of this reform, a set of expectations has been set for public hospitals, with great emphasis on quality of service and patient satisfaction. In 2015, the former National Health and Family Planning Commission (NHFPC), now known as the National Health Commission of China, put forth the “China Healthcare Improvement Initiative” (CHII), which specified a list of requirements for health care providers.<sup>4</sup> In particular, the initiative urged public hospitals to raise patient satisfaction through a variety of service improvements, including optimizing process management to reduce waiting times, enhancing the physical environment, and promoting humanism in health care.<sup>5</sup>

In the meantime, patient satisfaction has received increasing attention in the health care delivery system, as patients have become more aware of their own rights when seeking medical services and as hospitals are facing a more competitive market environment.<sup>6</sup> First, patient perception of wellness can reflect information about treatment outcomes and quality that might be hard to quantify using traditional medical tests.<sup>7</sup> In addition, it captures unique information about patients’ experience, such as interaction with physicians, involvement in treatment decisions, and the convenience and accessibility of facilities, which are all important in building a patient-centered health care service system.<sup>8,9</sup> Therefore, in order to achieve higher patient satisfaction, policy makers and health care providers need a better understanding of the various aspects and modifiable factors of patient satisfaction.

There is a large body of research in developed countries examining patient satisfaction in outpatient settings, such as primary care and hospital emergency departments (EDs). Generally, factors influencing satisfaction include patients’ sociodemographic and care-related characteristics. More specifically, a variety of studies have identified the effects of age, income, ethnicity, education, occupation, and self-reported

health on satisfaction.<sup>10–13</sup> Care-related characteristics include subjective and technical components of a medical interaction, such as actual and perceived wait times, ratings of nurse and physician empathy, and perceptions of technical care.<sup>11</sup> Waiting times, including both perceived and actual waiting times, have been found to be a significant factor that influences outpatient satisfaction.<sup>14–16</sup> Interpersonal interactions and technical competence of providers are also important factors associated with patient satisfaction in both primary and ED care.<sup>12,17,18</sup> Providing patients with sufficient information and instructions is associated with higher levels of satisfaction in ED services.<sup>11,16,19</sup> Because some factors are not easily measured by objective indicators, many studies use patient ratings and reports on various aspects of care to measure perceived quality of care.<sup>11,17</sup> It has been suggested that efforts to increase patient satisfaction should focus on improving primary care and ED performance based on these identified aspects.<sup>20</sup>

In China, patient satisfaction studies have started to attract more and more attention only in recent years. Researchers have explored different dimensions of outpatient satisfaction within both hospitals and primary care settings. Most studies have focused on the effects of patient sociodemographic characteristics on overall satisfaction, such as age, education, income, occupation, insurance, and health status.<sup>21,22</sup> Some studies have also explored the influence of care-related factors, such as infrastructure, interpersonal-communication skills, and attitudes of providers.<sup>23–25</sup> However, there are no consistent and solid conclusions on the most important factors that determine satisfaction. Moreover, all of the previous studies have tended to be local and with relatively small sample sizes, meaning they were not nationally representative.

We tried to narrow this gap within the existing literature by examining how perceived quality of care was associated with outpatient satisfaction in China. The country’s newly established and fast-growing health care delivery system provides a unique setting to discover the best ways of improving quality of medical services and patient satisfaction, which can be useful for the rest of the low- and middle-income world. This study deployed data from a national survey of patient satisfaction commissioned by the NHFPC and conducted in 136 tertiary hospitals across 31 provinces of China in 2017. This survey, known as the China National Patient Survey, was initially designed to evaluate the effect of the CHII (2015–2017).<sup>26</sup> In this survey, data were collected to measure patients’ perceptions of multiple aspects of hospital service.

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This enabled us to explore how a patient's overall satisfaction was determined by perceived quality of various aspects of care, which could help hospitals and the government improve patient satisfaction in more effective ways.

## Methods

### Survey Instrument

In 2015, after implementation of CHII (2015-2017), the NHFPC commissioned Peking Union Medical College (PUMC) School of Public Health to conduct an annual evaluation survey of this initiative. The survey has been conducted 3 consecutive times from 2015 to 2017. This study deployed data from the third-round survey in 2017. The survey questionnaire was based on CHII implementation strategies (2015-2017)<sup>27</sup> and relevant studies about questionnaire designs for patient surveys. Overall satisfaction was measured by asking the single question, "Overall, are you satisfied with this visit?" and responses were on the 5-point Likert scale: 5 (Very satisfied), 4 (Satisfied), 3 (Moderate), 2 (Unsatisfied), or 1 (Completely unsatisfied). In addition to overall satisfaction, the questionnaire contained 19 questions to measure patient perceptions of care-related characteristics. These questions also used a 5-point Likert scale, with response options of 5 (Very good), 4 (Good), 3 (Moderate), 2 (Poor), and 1 (Very poor). The questionnaire was validated by small-scale multidisciplinary-expert consultations, cognitive interviews with 30 patients, and pilot field tests with 100 participants. The Kaiser-Meyer-Olkin value was 0.961, and the  $\chi^2$  value of Bartlett's test of sphericity was 47 671.475 ( $P < .001$ ), indicating the data were adequate for factor analysis. Principal component analysis and varimax rotation were used to perform exploratory factor analysis. Three factors were extracted, including "service & treatment" "waiting time," and "hospital environment," which explains the total variance of 64.1%. The item of "affordability of expense" was not captured well by the above 3 factors, so it stands to be a single dimension of "cost." Cronbach  $\alpha$  was 0.941, indicating that the questionnaire was internally consistent and reliable. The questionnaire collected such patient sociodemographic information as gender, age, income, education, and household registration.

### Setting and Participants

We conducted the survey in 136 tertiary hospitals across 31 provinces of China from December 2017 to January 2018. Within each province, we selected 1 provincial general hospital, 1 provincial Traditional Chinese Medicine (TCM) hospital, and 1 provincial maternal/children's hospital. The remaining 43 hospitals included were NHFPC-affiliated national-level hospitals (28 general hospitals and 15 specialist hospitals). With the assumption that 85% of outpatients were satisfied with hospital service, we set the significance

level at .05 to calculate the minimum sample size, which was 196 per hospital. Thus, sample size was 200 per hospital. Patients in EDs and "Very Important Person (VIP) clinics" (an outpatient department with shorter waiting times, senior physicians and higher charges) were excluded due to their special characteristics. Guardians of pediatric patients were interviewed on their behalf.

### Data Collection

Trained investigators administered the survey, using their cell phones, in the selected hospitals. For the outpatient survey, the investigators randomly selected patients at the outpatient drug-dispensing window, as such patients usually had completed the diagnosis, treatment, and payment stages of their visits and were waiting for their medications. At least 200 outpatients per hospital were selected and interviewed. According to the investigators' records, response rate was about 73.2%. A total of 28 822 patients were interviewed, with 28 760 effective responses (99.78% effective rate).

### Statistical Analysis

We used descriptive analysis to describe patient characteristics and item scores. Mann-Whitney  $U$  and Kruskal-Wallis tests were conducted to examine differences in overall satisfaction scores between patient groups. We calculated Spearman rank correlation coefficient (SCC) to determine the correlation between item scores and overall satisfaction. Multivariate binary logistic regression was performed to explore the association of patient demographics and care-related characteristics (19 items across 4 domains) with overall satisfaction, for which we used a stepwise-regression method (forward, with  $P < .05$  included and  $P > .10$  excluded). Overall satisfaction was transformed into a binary variable for logistic regression analysis, with value = 1 for Very satisfied and Satisfied and value = 0 for Moderate, Unsatisfied, and Completely unsatisfied. We performed all of the data analysis using SPSS software version 22.0.

### Ethics Statement

The protocol for this study was approved by the Ethics Committee of PUMC (SPH201712CHII206). The patient satisfaction survey was anonymous. We obtained informed consent from each respondent before administering the survey.

## Results

Of the 28 760 participants, the majority (64.6%) were female, 72.4% were urban residents, 51.9% were young adults (age 18-35), 54.5% had an annual income  $\leq$ 60 000 RMB, and 58.9% had at least a college degree (Table 1). Mean overall satisfaction score was  $4.38 \pm 0.71$ . Within each pair of

**Table 1.** Descriptive Summary of Patient Characteristics and Overall Satisfaction.

Characteristics	Total number (%)	Overall satisfaction ( $\pm$ SD)	<i>P</i> value
Total	28760 (100)	4.38 $\pm$ 0.71	
Gender			.000 <sup>a</sup>
Male	10 189 (35.4)	4.36 $\pm$ 0.71	
Female	18571 (64.6)	4.39 $\pm$ 0.71	
Household registration			.000 <sup>a</sup>
Urban	20832 (72.4)	4.40 $\pm$ 0.70	
Rural	7928 (27.6)	4.33 $\pm$ 0.73	
Age			.000 <sup>b</sup>
18-35	14929 (51.9)	4.36 $\pm$ 0.72	
35-65	12005 (41.7)	4.39 $\pm$ 0.70	
>65	1826 (6.3)	4.45 $\pm$ 0.70	
Income			.002 <sup>b</sup>
0-60 000 RMB	15 686 (54.5)	4.37 $\pm$ 0.71	
60 000-120 000 RMB	6 954 (24.2)	4.40 $\pm$ 0.70	
>120 000 RMB	6 120 (21.3)	4.39 $\pm$ 0.72	
Education			.000 <sup>b</sup>
Middle school and below	4417 (15.4)	4.37 $\pm$ 0.71	
High school	7391 (25.7)	4.36 $\pm$ 0.71	
College and up	16 952 (58.9)	4.39 $\pm$ 0.71	

<sup>a</sup>Mann-Whitney *U* test<sup>b</sup>Kruskal-Wallis test.

subgroups, female patients (4.39  $\pm$  0.71) and urban patients (4.40  $\pm$  0.70) were more satisfied than their respective counterparts. In terms of age, patients age  $\geq$ 65 (4.45  $\pm$  0.70) were more likely to give a higher satisfaction score than younger patients. Middle-income patients (annual household income 60 000-120 000 RMB, 4.40  $\pm$  0.70) and patients with at least a college educational level (4.39  $\pm$  0.71) were also more satisfied.

Table 2 shows overall satisfaction scores as well as scores for different items across the 4 dimensions, plus SCCs between these item scores and overall satisfaction score. Of the 19 items, “privacy protection” garnered the highest score (4.44  $\pm$  0.68), followed by “the physician’s medical skill” (4.42  $\pm$  0.70) and “inquiry by medical staff into patient’s medical history and current situation” (4.40  $\pm$  0.75), which were all in the service & treatment domain. The items with the lowest scores were consequently “waiting time before consultation” (3.96  $\pm$  0.98), “waiting time for medical test” (4.01  $\pm$  1.01), and “cleanliness of bathrooms” (4.09  $\pm$  0.95), indicating low satisfaction with waiting times and hospital environment. SCC showed that all of these item scores were significantly correlated with overall satisfaction ( $P < .01$ ), and the items with the highest correlations appeared to be “the physician’s medical skill” (SCC = 0.655), “timely guidance from the staff when needed” (SCC = 0.640), and “feeling respected by the physicians and nurses” (SCC = 0.633).

We examined the relationship between overall satisfaction and different item scores using multivariate logistic regression, controlling for patient sociodemographic characteristics. The stepwise (forward) method was used to determine the final equation. As shown in Table 3, 12 variables entered this equation, and all of them were related to patients’ perceptions. Of these variables, the physician’s medical skills (odds ratio [OR] = 1.71; 95% confidence interval [CI], 1.71-2.67), inquiry into patient’s medical history and current situation (OR = 1.42; 95% CI, 1.14-1.76), and convenience of using the elevator in the hospital in question (OR = 1.35; 95% CI, 1.18-1.54) were the 3 strongest predictors of overall satisfaction. Patient sociodemographic variables were all excluded from the equation, indicating that no sociodemographic characteristic had significant influence on overall satisfaction after we controlled for patient perception variables. The accuracy rate of this model was as high as 90.1%. The OR with 95% CI,  $\beta$ , standard error (SE), and *P* value for each independent variable in the final equation are reported in Table 3.

## Discussion

This study revealed the degree of patient satisfaction with outpatient services in tertiary hospitals across China, as well as patients’ perceptions of various aspects of care. In addition, it investigated the role these perceptions had in determining overall satisfaction, indicating areas of improvement for patient satisfaction in the current hospital outpatient service system.

In our analysis, we found that overall patient satisfaction with outpatient service in these tertiary hospitals was high, with an average score of 4.38, and the satisfaction rate (percent of people who chose “Very satisfied” or “Satisfied” for the overall satisfaction question) was 90.1%. This result was consistent with previous rounds of the survey; for example, in the first round, outpatient satisfaction was 4.42  $\pm$  0.68. This was higher than residents’ satisfaction with outpatient service in the 2013 National Health Service Survey of China, due to different sample groups and target services, but it is comparable to similar survey results in many other countries.<sup>26</sup> It is also consistent with a 2013 outpatient survey in 11 tertiary hospitals in Shanghai, in which the mean score for overall satisfaction was 4.0  $\pm$  0.7.<sup>23</sup> In terms of patient perceptions of specific items, “privacy protection,” “the physician’s medical skill,” and “inquiry of medical staff into patients’ medical history and current situation” earned the highest scores. Privacy protection might have been rated so highly due to the recent improvements by hospitals in this arena. The government has put forth clear requirements for privacy protection in the new version of its hospital accreditation standards,<sup>28</sup> such as “1 patient in 1 consultation room at a time,” which was also a requirement of the CHII. In a similar survey conducted in Shanghai, privacy protection was also the most highly rated item.<sup>29</sup> In our survey, patients

**Table 2.** Perceived Quality Item Scores and Correlation With Overall Satisfaction.

	Items	Mean ( $\pm$ SD)	Spearman
<b>Waiting time</b>	Waiting time of registration	4.04 $\pm$ 0.94	0.047**
	Waiting time before consultation	3.96 $\pm$ 0.98	0.504**
	Length of the communication with the doctor	4.25 $\pm$ 0.84	0.561**
	Waiting time for medical test	4.01 $\pm$ 1.01	0.521**
	Waiting time to get my medication	4.20 $\pm$ 0.87	0.496**
	Waiting time for paying bills	4.32 $\pm$ 0.79	0.512**
<b>Service &amp; treatment</b>	Inquiry of medical staff on medical history and current situation with patience	4.40 $\pm$ 0.75	0.618**
	Explaining test results in detail	4.33 $\pm$ 0.80	0.614**
	Explaining treatments, medications with patience	4.36 $\pm$ 0.78	0.614**
	Feeling respected by the physicians and nurses	4.38 $\pm$ 0.74	0.633**
	Privacy protection	4.44 $\pm$ 0.68	0.602**
	Attitude of staff members at the pharmacy or the charger	4.29 $\pm$ 0.82	0.599**
<b>Cost</b>	Physician's medical skill	4.42 $\pm$ 0.70	0.655**
	Timely guidance from the staff when needed	4.36 $\pm$ 0.76	0.640**
	Affordability of expense of this visit	4.19 $\pm$ 0.90	0.501**
<b>Environment</b>	Convenience of elevator	4.20 $\pm$ 0.95	0.502**
	Cleanliness of bathrooms	4.09 $\pm$ 0.95	0.511**
	Enough chairs in the waiting zones	4.13 $\pm$ 0.97	0.521**
	Drinking water supplies in the waiting zones	4.16 $\pm$ 0.99	0.534**

\*\*Significant at  $P < .01$ .

**Table 3.** Multivariate Logistic Regression Analysis.

	Domain	OR	95% CI	$\beta$	SE	P value
<b>Intercept</b>				-11.56	.57	.000
<b>Physician's medical skill</b>	Service & treatment	2.13	1.71, 2.67	.76	.11	.000
<b>Inquiry of medical history and current situation with patience</b>	Service & treatment	1.42	1.14, 1.76	.35	.11	.002
<b>Convenience to use the elevator in this hospital</b>	Environment	1.35	1.18, 1.54	.30	.07	.000
<b>Feeling respected by the medical staff</b>	Service & treatment	1.31	1.06, 1.62	.27	.11	.013
<b>Timely guidance from the staff when needed</b>	Service & treatment	1.30	1.07, 1.58	.26	.10	.008
<b>Explaining treatments, Medications with patience</b>	service& Treatment	1.30	1.06, 1.59	.26	.10	.012
<b>Waiting time before consultation</b>	Waiting time	1.30	1.13, 1.49	.26	.07	.000
<b>Waiting time for medical test</b>	Waiting time	1.29	1.12, 1.49	.26	.07	.000
<b>Privacy protection</b>	Service & treatment	1.28	1.04, 1.57	.25	.11	.019
<b>Waiting time to pay bills</b>	Waiting time	1.25	1.07, 1.47	.23	.08	.006
<b>Cleanliness of bathrooms</b>	Environment	1.17	1.01, 1.37	.16	.08	.041
<b>Drinking water supplies in the waiting zones</b>	Environment	1.17	1.03, 1.33	.16	.07	.020

Note. Method: Forward, with  $P < .05$  included and  $P > .10$  excluded; Final model statistics: -2 log likelihood, 1752.497; Nagelkerke  $R^2$ , .469;  $\chi^2$ , 1094.316,  $P < .001$ ; 90.1% cases were correctly classified.

ranked physicians' medical skills highly, probably because the sample hospitals are all top tertiary hospitals in China and patients trust that physicians working in these hospitals excel in their professional skill. Patients were also highly satisfied with the medical staff's inquiries into their medical histories and current situations and the staff's explanation of treatments/medications, which reflected that medical staff in these hospitals were following the code of conduct and treating patients with patience and professionalism. By contrast, patient satisfaction with waiting times was relatively low

across all of the items, especially waiting times before consultations and for medical tests. This was consistent with the findings of previous studies.<sup>25,27</sup> The media characterizes outpatient service in large hospitals in China as "3 longs and 1 short," meaning long waiting times for registration, consultation, and paying bills, and short times for the actual consultation.<sup>30,31</sup> Although hospitals have adopted various measures to reduce waiting times, this problem has not yet been solved, largely due to the huge volume of outpatient visits every day. Some tertiary hospitals had more than 20 000 outpatient

visits per day, and doctors must see more than 100 patients over the course of 1 day.<sup>32,33</sup> Hospital environment also earned a relatively low score, especially cleanliness of bathrooms. This implied that nonmedical aspects of care in these hospitals still need major improvement.

Our study identified discrete variables of perceived quality that influenced overall satisfaction, demonstrating which aspects of hospital service were most valued by patients. We found that 12 variables across 4 domains accounted for most of the variance in overall satisfaction. Of all these variables, perception of “the physician’s medical skills” (OR = 2.13; 95% CI, 1.71-2.63) was the most powerful determinant of overall satisfaction. This means that patients attached great importance to medical skills even in outpatient settings, largely due to the wide disparity in professional skills among physicians in China. In the previous rounds of the survey, we found that the most concerning issue for Chinese patients seeking care was “medical technology.”<sup>26</sup> The second most powerful determinant of satisfaction was “inquiry into patient’s medical history and current situation” (OR = 1.42; 95% CI, 1.14-1.76), which was also a reflection of the physician’s professionalism as perceived by patients. This was consistent with other researchers’ findings that perceived quality of medical care is a stronger predictor of patient satisfaction than facility environment, wait times, and other nonmedical factors in ED care.<sup>18,34-36</sup> The third was “convenience of using elevators in the hospital” (OR = 1.35; 95% CI, 1.18-1.54). This is not surprising in China, because large hospitals are usually very crowded and have different departments on different floors. Patients go upstairs and downstairs numerous times to have tests performed and to pay bills. Especially for patients whose medical conditions limit their mobility, the convenience of elevators could be an important concern.

As with the above 3 determinants, we found similar determinant power in “feeling respected by the medical staff” (OR = 1.31; 95% CI, 1.06-1.62), “timely guidance from the staff when needed” (OR = 1.30; 95% CI, 1.07-1.58), and “explaining treatments and medications with patience” (OR = 1.30; 95% CI, 1.06-1.59). These 3 variables were all from the service & treatment domain and reflected the humanism, responsiveness, and communication quality of the service. Respect for the patient is a fundamental aspect of humanism in health care and is one of the most important predictors of overall satisfaction.<sup>37</sup> In China, previous media reports have stated that due to heavy workload, medical staff in large hospitals easily became impatient with and unsympathetic to patients. However, the government has tried to change this by promoting “patient-centered care,” and initiatives such as CHII also require hospital staff to improve attitudes and show respect to patients. Timely help from the staff has also been identified as a critical concern for ED patients in the United States.<sup>11</sup> “Explanation of treatments/medications” indicated whether patients were provided with necessary instructions and other crucial information. A series of studies have found that being given sufficient instructions is

critical to patient satisfaction.<sup>11,19,37-39</sup> These findings suggest that hospitals could improve their performance in these areas to increase satisfaction.

Many studies have identified the association between waiting times and satisfaction. Ours further explored the influence of specific waiting times on satisfaction. We found that waiting times before consultation (OR = 1.30; 95% CI, 1.13-1.49), for medical tests (OR = 1.29; 95% CI, 1.12-1.49), and for paying bills (OR = 1.25; 95% CI, 1.07-1.47) had significant effects on patient satisfaction, whereas length of consultation time itself was not a significant influence. Considering that associations of “inquiry into medical history and current situation” and “explanation of treatments and medications” with overall satisfaction were both significant and strong, it could be inferred that for Chinese patients, quality of communication is more important than length of consultation time. It seemed that outpatients were most sensitive to waiting times for consultation and paying bills, implying that hospitals need better process management to reduce these waiting times.

Aside from elevators, cleanliness of bathrooms (OR = 1.17; 95% CI, 1.01-1.37) and supply of drinking water (OR = 1.17; 95% CI, 1.03-1.33) also influenced patient’s satisfaction in a slightly less powerful way. Public hospitals have long been criticized for their poor amenities and environments. This result showed that the perceived quality of physical environment had an impact on patient satisfaction. If hospitals want to ameliorate patients’ impressions of their service, they must make improvements in these areas.

In this study, perceived cost did not seem to have a significant effect on patient satisfaction. We measured perceived cost by asking whether the expenses for the visit were affordable for the patient. Thanks to the health care reform that has been underway since 2009, which has expanded insurance coverage and reduced unreasonable medical costs, we did not find that cost or affordability compromised satisfaction.

As for patient demographics, although nonparameter tests showed that differences in gender, age, registration status, income, and education level make for significant differences in satisfaction, our stepwise logistic regression excluded all of these factors. In an earlier article, we explored the associations between patient sociodemographic factors and satisfaction in different domains and found a great many correlates.<sup>40</sup> This indicated that all of these patient characteristics may influence overall satisfaction through the intermediary of perceived quality of care. Some studies have also found that patient demographic factors are no longer more important than care-related factors,<sup>34,39,41</sup> while in other studies, sociodemographic variables, such as age, insurance type, race, and income, were still found to significantly influence satisfaction even when care-related factors were taken into account.<sup>11,17</sup> The influencing role of sociodemographic factors on patient satisfaction and the mechanisms by which they do so remain ambiguous and need further exploration.

## Limitations

Although this study identified the effects of key care-related characteristics on outpatient satisfaction using nationally representative data, there were still several limitations. First, sample hospitals were all top tertiary hospitals and may not have represented patient satisfaction with the entire nationwide medical care system. Second, the satisfaction ratings might have been biased to be a little high because the survey was conducted onsite in the hospital. Although we did not permit hospital staff to be present, as this would have influenced responses, it is still possible that patients tended to give a relatively high score when interviewed in the hospital. Third, this study selected care-related characteristics mostly based on CHII implementation strategies. Aspects of care that are crucial for patient satisfaction might not have been included in the survey. This could have positively biased the importance of the variables that we studied. Further research could explore the effect of other important care-related factors on satisfaction, and some objective measures of patient experience such as the actual waiting time could be used to reflect quality of care.

## Conclusion

Chinese outpatient satisfaction with tertiary hospitals was relatively high, especially with medical aspects of care. Satisfaction in nonmedical domains, such as waiting times and environment, was relatively low. For determinants of overall satisfaction, it seemed that Chinese patients valued professional medical care and respect from the medical staff more than nonmedical aspects of care. However, convenience of elevators seemed to be an outstanding issue that influenced satisfaction in a powerful way. Waiting times and other environmental characteristics also mattered. We found demographic characteristics to be insignificant after we had included all of the care-related measures, which suggests that these factors might have influenced satisfaction indirectly. Taken as a whole, these findings implied that Chinese hospitals should ensure quality of medical care and communication with patients, paying more attention to patients' psychological needs. In the meantime, improvements should be made to nonmedical aspects of care, especially waiting times and physical environment. As patients' expectations increase and the health care market gives them more choices, these nonmedical aspects will become more and more important in determining satisfaction and shaping patient choice. Compared with previous studies, this study adds value to the global body of research in that it studied subjective care-related characteristics and satisfaction in low- and middle-income countries, providing useful implications that these countries can use to improve patient satisfaction.

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## Author Contributions

L.H. designed the research question and structure of the article and did most of the writing of the manuscript. H.D. conducted literature review and contribute to some of the writing. G.H., Z.W., and S.L. performed data cleaning and statistical analyses. Y.L. provided guidance and overall support for the article. All authors read and approved the final manuscript.

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## Ethics Approval

This study was approved by the Research Ethics Committee of the Chinese Academy of Medical Science & Peking Union Medical College. An informed consent was obtained from all respondents before the interviews.

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## Data Sharing Statement

The data that support the findings presented in this study are available from the Public Health School of Peking Union Medical College with a few restrictions. The data were used under license for the current study and so are not publicly available. Data are, however, available from the authors upon reasonable request and with permission from the Authority of Public Health School of Peking Union Medical College.

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