ORIGINAL RESEARCH

Factors affecting patient satisfaction with ecdemic medical care: a cross-sectional study in Nanchang, China

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Purpose: This study aimed to determine the factors that influence patient satisfaction with ecdemic medical care.

Materials and methods: Eight hundred and forty-four face-to-face interviews were conducted between October and November 2017 in two high-profile hospitals in Nanchang, China. Patient satisfaction was divided into lowest and highest satisfaction groups according the 80/20 rule. Demographic factors associated with patient satisfaction were identified by logistic regression models.

Results: Respondents' main reasons for choosing a non-local hospital were "high level of medical treatment" (581/844), "good reputation of the hospital" (533/844), and "advanced medical equipment" (417/844). The top three items that dissatisfied the ecdemic patients were "long time to wait for treatment" (553/844), "complicated formalities" (307/844), and "poor overall service attitude" (288/844). Fewer female patients (adjusted odds ratio [AOR] =1.47, 95% confidence interval [CI] =1.03–2.11), patients with a family per-capita monthly income (FPMI) between 3,001 and 5,000 CNY (AOR =1.40, 95% CI =1.01–2.17), inpatients (AOR =1.46, 95% CI =1.01–2.13), and more patients with an FPMI >7,000 CNY (AOR =0.43, 95% CI =0.20–0.92) were detected in the lowest satisfaction group. Fewer patients with an associate's or bachelor's degree (AOR =2.40, 95% CI =1.37–4.20) and patients with an FPMI >7,000 CNY (AOR =3.02, 95% CI =1.10–8.33) were detected in the highest satisfaction group. Moreover, more inpatients (AOR =0.70, 95% CI =0.54–0.97) and those aged 46–65 years (AOR =0.63, 95% CI =0.33–0.98) were detected in the highest satisfaction group.

Conclusion: Findings suggested that managers of the medical facilities should note the importance of increasing their publicity through a rapidly developing media, as well as the necessity of creating a more patient-friendly medical care experience. Hospitals should also focus on the medical care experience of patients with relatively lower and higher income levels, male ecdemic patients, and ecdemic outpatients.

Keywords: patient satisfaction, ecdemic medical care, ecdemic patients, the 80/20 rule

Introduction

The distribution of health resources among different areas and cities varies greatly in China.[1–3] High-quality health resources are mainly allocated in megacities such as Beijing, Shanghai, Guangzhou and major provincial capitals such as Wuhan, Chengdu, and Nanjing.[1,3] Therefore, facing such an uneven distribution of health resources leaves no choice but to travel to big cities in order to access high-quality health resources for residents living in areas where health resources are relatively scarce.[4] These patients are termed as "ecdemic patients" in China, and this care-seeking behavior is called

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"the ecdemic medical care/treatment" in China. Since the economic reform in the 1970s, many changes have taken place in China. The disease spectrum of Chinese people and general attitudes toward health have transformed.[5–7] The demand for better health services of Chinese nationals is still increasing with greatly improved living standards.[4,8] Consequently, such alterations have increased the prevalence of the ecdemic medical care/treatment.

The ecdemic medical care in this article specifically refers to a patient who receives medical services in any place outside an individual's officially registered residence location.[4] The recent completion of the high-speed railway and expressway network have expedited intercity travel and have made the ecdemic medical care much easier. Moreover, according to the 2017 Report on China's Migrant Population Development, 292 million residents had lived in a location away from their officially registered location of residence for more than 6 months in 2016.[9] Meanwhile, the 2016 Statistical Communiqué of the People's Republic of China on National Economic and Social Development records a number of 169.34 million migrant rural workers living in Chinese urban areas.[10] An evident result of this is that when those migrant rural workers seek medical treatment, they are most likely to turn to the hospitals nearby instead of the hospitals in their hometown, which is most likely their formally registered location of residence.[4] Hence, there are a large number of people who have had previous experience of the ecdemic medical care in China.

The Chinese government has realized the fact that there are a large number of patients who get medical treatment away from home and that the numbers are still rising rapidly. Therefore, the Chinese government has been trying to solve this issue, including establishing a direct medical insurance payment system for the ecdemic patients, building a national network for basic health care insurance, and strengthening the cooperation among administration departments of health care in different cities.[11–14] These measures had effectively lessened the medical economic burden on ecdemic patients, met the demand for the ecdemic medical care to some extent, and increased the degree of satisfaction with health care services among ecdemic patients.[11,13,14]

Patient satisfaction is a key measurement of the quality of medical service, as it directly assesses medical service from the perspective of patients toward health care.[15,16] The National Health Service system can affect patient satisfaction.[17,18] However, as the direct provider of medical service, hospitals have the ability to promote patient satisfaction by improving the quality of medical services on their side.[19–23] Government and the related policies, on the other hand, have a more limited impact on the improvement of patient satisfaction.

In response to the severity of the conflict between doctors and patients,[24,25] Chinese hospitals are now attempting to provide services in all aspects using the principles for patient-centered care, which may improve their service quality and efficiency, and enhance the timeliness and rationality of their decision-making on health care.[26–28] In this process, patients, especially the ecdemic patients, can provide valuable opinions and suggestions that are crucial toward the development of hospitals. Therefore, a large number of medical facilities have added great importance to the evaluation of patient satisfaction with their medical experience, and have conducted many routine satisfaction surveys and initiatives.

Current studies on patient satisfaction have been conducted primarily to focus on the general population or groups with certain diseases, such as cancer patients.[15–17,19–23,25–27,29] Some empirical studies are conducted in developed countries, focusing on patient mobility and its influencing factors.[30–32] However, few research studies have specifically targeted the ecdemic patients in China. Therefore, this study considered such a population group as its object and aimed to investigate the reasons underlying their preference for specific hospitals, to determine the causes of unsatisfactory experiences in the medical facilities, and to explore differences in satisfaction between patients with different demographic statistics. Moreover, this study can also provide references for hospitals to improve their service and for policymakers to establish or adjust relevant policies.

Materials and methods
Material sources

The present survey was conducted in Nanchang – the capital city of Jiangxi province as well as being one of the megacities located in the economic belt of middle reach of Yangtze River. Nanchang is a major transportation hub connecting the prosperous coastal areas of Southeast China. Convenient transportation provides access for residents from other places to seek high-quality medical care services in Nanchang. We selected the First Affiliated Hospital of Nanchang University and Jiangxi Zhonghuan Hospital, because these two comprehensive hospitals are a good representation of the high-profile public hospitals and private hospitals in Jiangxi province, respectively. They accept the largest number of patients living outside of Nanchang city.

Data collection and sampling

According to the study design, patients (or their caregivers) from other areas who were aged ≥18 years were considered to be within the inclusion criteria of survey participants. The qualified participants (non-local household registration – known

as "hukou" in Chinese) were briefly told about our study and were asked about their willingness to participate in the study. Convenience sampling strategy was used to carry out the investigation. Between October and November 2017, trained public health graduate students collected the data by means of face-to-face interviews. Our survey was conducted from 9 AM to 4 PM each day, excluding Saturday afternoons and Sundays (the hospitals provide services only to inpatients and do not operate during these times).

Questionnaire

The questionnaire used in this study was based on the Improvement and Assessment of Patient Satisfaction Questionnaire in General Hospitals.[29] There was sufficient evidence for reliability and construct validity of this questionnaire; the Cronbach's alpha coefficient of the questionnaire was 0.912, and the Cronbach's alpha coefficients of all dimensions ranged from 0.669 to 0.801. We also designed the basic social demographic characteristic questionnaire based on local circumstances and specific needs of this study. Participants were also asked to list their main reasons for choosing a non-local hospital and the most unsatisfactory items for the hospital that served them. The majority of the questions in the original edition used a 5-point Likert scale. It is hard to differentiate patient satisfaction, as most respondents may choose "neutral" (scored 3) if using the 5-point Likert scale.[29] In the current study, we used a 9-point Likert scale, where a higher score indicated higher patient satisfaction. We also measured the internal reliability of our questionnaire, and the Cronbach's alpha coefficient was 0.902.

Sample size calculation

The sample size for this study was determined according to the formula for the cross-sectional survey study as follows: $n = \frac{\mu^2_{\alpha/2}\pi(1-\pi)}{\delta^2}$,[33] where n is the sample size, π is the overall satisfaction rate, and δ is the desired level of precision. The overall satisfaction rate was obtained from pre-survey (n=87), and it was 78.67%. Meanwhile, we desired a 95% confidence level and 5% precision; hence the sample size was calculated to be: $n = \frac{1.96^2 \times 0.7867 \times (1-0.7867)}{0.05^2} = 257.85$, rounded to 258. However, we got 844 valid questionnaires, which was far more than expected. Hence, there should be adequate power for analyses.

Statistical analysis

The IBM SPSS version 22.0 for Windows (IBM Corporation, Armonk, NY, USA) was used to perform all the analyses in this study. An initial descriptive analysis was first conducted. The frequencies and proportions were used to summarize the respondents' demographic characteristics, their main reasons for choosing a non-local hospital, and the most unsatisfactory items for the hospital that served them. The demographic information of the participants is summarized in Table 1. The main reasons for choosing a non-local hospital are shown in Figure 1, and their most unsatisfactory items are shown in Figure 2. Patient satisfaction was divided into lower and higher satisfaction groups according the 80/20 rule (also known as Pareto principle).[34] The 80/20 rule states that, for many events, roughly 80% of the effects come from 20% of the causes. We believe that these 20% of patients who gave the highest and lowest satisfaction score are the target population that the managers of hospitals should especially focus on. The population with the highest and lowest scores was selected. Then, by using binary logistic regression models, we distinguished the diverse patient satisfaction in different population subgroups. The crude odds ratios (CORs) and adjusted odds ratios (AORs) with 95% confidence interval (CI) obtained from univariate and multivariable logistic

Table 1 Demographic information of the participants (N=844)

Variables	Demographic characteristics	n	%
Gender	Male	402	47.63
	Female	442	52.37
Age (years)	≤25	273	32.35
	26–45	289	34.24
	46–65	215	25.47
	>65	67	7.94
Education level	≤Elementary school	321	38.03
	Middle/high school	204	24.17
	Associate's/bachelor's degree	210	24.88
	≥Master's degree	109	12.91
Marital status	Married	543	64.34
	Unmarried	293	34.72
	Widowed	7	0.83
	Other	1	0.12
FPMI (CHY)	≤3,000	408	48.34
	3,001–5,000	322	38.15
	5,001–7,000	71	8.41
	>7,000	43	5.09
Household registration	City	289	34.24
	Countryside	555	65.76
Type of patient	Outpatient	507	60.07
	Inpatient	337	39.93
Type of health insurance	MIUR	239	28.32
	NRCMI	418	49.53
	MIUW	145	17.18
	CMI	42	4.98
Total	–	844	100.00

Abbreviations: FPMI, family per-capita monthly income; MIUR, medical insurance for urban residents; NRCMI, new-type rural cooperative medical insurance; MIUW, medical insurance for urban workers; CMI, commercial medical insurance.
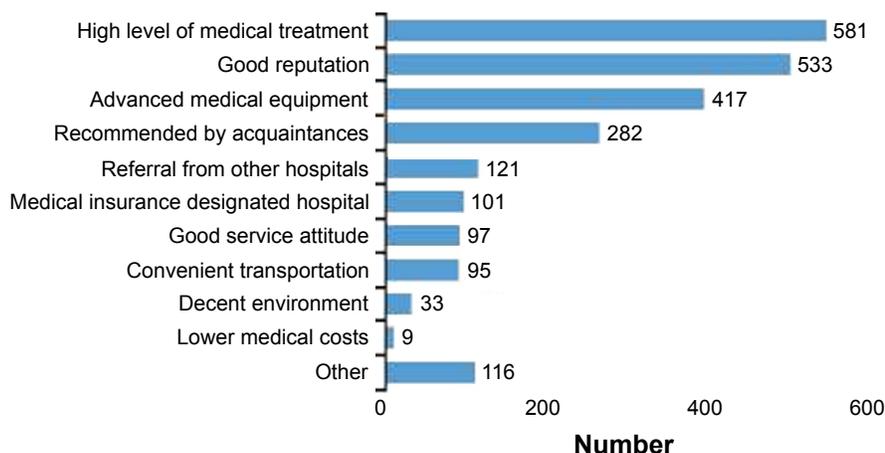
Figure 1 Patients' main reasons for choosing the hospital.

regression models are summarized in Tables 2 and 3, respectively. The *p*-value of <5% was considered to be statistically significant.

Quality control

First, the questionnaire was inspected and edited by relevant domestic and international scholars and experts in this field based on the local circumstances and specific needs of this study. Second, the interviewees who carried out the investigation received strict training, and only qualified personnel were eligible for a face-to-face interview. The interviewees were very conscientious and diligent in this survey, because most of them were going to use the data for their graduation thesis. Third, pre-investigations of the target population were conducted to ensure the face validity and comprehension of the survey paper. In addition, we had a meeting every 5 days to discuss the difficulties and improvement suggestions for the interview. Finally, by using Excel 2010 (Microsoft Corporation, Redmond, WA, USA) each completed questionnaire was separately imported into two different databases by two

students, and then it was cross-verified. Only the variables that were exactly the same in the two databases were considered accurate and the rest were further compared with the original questionnaire.

Ethical statement

The study protocol was reviewed and approved by the Research Ethics Board of Provincial Postgraduate Innovation Projects and School of Health Sciences of Wuhan University (IRB No YC2015-S039). Informed consent information was attached on the top of each questionnaire and presented before the surveys. The participants completed and signed the informed consent documents.

Results

Demographic information of the participants

A total of 844 patients participated in our study with 402 males (47.63%) and 442 females (52.37%), of whom most
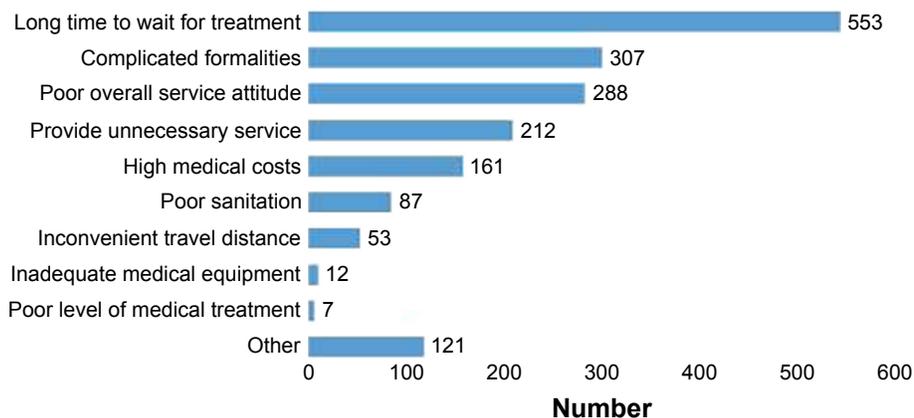

Figure 2 Patients' most unsatisfactory items regarding hospital services.

Table 2 Logistic regression analysis of influencing factors associated with patient satisfaction (for lowest score group)

Demographic factors	Scored 1–5 (n=170, 20.14%)	Scored 6–9 (n=674, 79.86%)	Crude OR (95% CI)	Adjusted OR (95% CI)
Gender				
Male	91 (22.34)	311 (77.36)	–	–
Female	79 (17.87)	363 (82.13)	1.34 (0.96–1.88)	1.47 (1.03–2.11)*
Age (years)				
≤25	55 (20.15)	218 (79.85)	–	–
26–45	66 (22.84)	223 (77.16)	0.85 (0.57–1.28)	0.79 (0.42–1.49)
46–65	37 (17.21)	178 (82.79)	1.21 (0.77–1.93)	0.99 (0.46–2.10)
>65	12 (17.91)	55 (82.09)	1.16 (0.58–2.31)	0.96 (0.38–2.40)
Education level				
≤Elementary school	64 (19.94)	257 (80.06)	–	–
Middle/high school	26 (12.75)	178 (87.25)	1.71 (1.04–2.80)*	1.61 (0.95–2.75)
Associate's/bachelor's degree	56 (26.67)	154 (73.33)	0.69 (0.45–0.99)*	0.68 (0.37–1.24)
≥Master's degree	24 (22.02)	85 (77.98)	0.88 (0.52–1.49)	0.82 (0.39–1.75)
Marital status				
Married	107 (19.71)	436 (80.29)	–	–
Other	63 (20.93)	238 (79.07)	0.93 (0.65–1.31)	1.09 (0.56–2.14)
FPMI (CNY)				
≤3,000	84 (20.59)	324 (79.41)	–	–
3,001–5,000	49 (15.22)	273 (84.78)	1.44 (1.01–2.13)*	1.40 (1.01–2.17)*
5,001–7,000	19 (26.76)	52 (73.24)	0.71 (0.40–1.26)	0.83 (0.43–1.59)
>7,000	18 (41.86)	25 (58.14)	0.36 (0.19–0.69)***	0.43 (0.20–0.92)**
Household registration				
City	60 (20.76)	229 (79.24)	–	–
Countryside	110 (19.82)	445 (80.18)	1.06 (0.75–1.51)	0.86 (0.53–1.39)
Type of patient				
Outpatient	113 (22.89)	394 (77.71)	–	–
Inpatient	57 (16.91)	280 (83.09)	1.41 (1.01–2.01)*	1.46 (1.01–2.13)*
Type of health insurance				
MIUR	49 (20.50)	190 (79.50)	–	–
NRCMI	82 (19.62)	336 (80.38)	1.06 (0.71–1.57)	0.99 (0.57–1.72)
MIUW	33 (22.76)	112 (77.24)	0.88 (0.53–1.44)	0.96 (0.53–1.75)
CMI	6 (14.29)	36 (85.71)	1.55 (1.00–3.88)	1.93 (1.00–2.14)

Notes: *$p<0.05$, **$p<0.01$, ***$p<0.001$.
Abbreviations: FPMI, family per-capita monthly income; MIUR, medical insurance for urban residents; NRCMI, new-type rural cooperative medical insurance; MIUW, medical insurance for urban workers; CMI, commercial medical insurance; OR, odds ratio; CI, confidence interval.

were outpatients (60.07%). Participants aged ≤25, 26–45, 46–65, and >65 years accounted for 32.35%, 34.24%, 25.47%, and 7.94% of the total sample size, respectively. Most of the participants (65.76%) were from rural areas. The participants' education level was classified as ≤elementary school, middle or high school, associate's or bachelor's degree, and ≥master's degree, accounting for 38.03%, 24.17%, 24.88%, and 12.91% of the total sample size, respectively. Participants' family per-capita monthly income (FPMI) <3,000 CNY (48.34%) and 3,001–5,000 CNY (38.15%) accounted for the majority of the sample. The largest proportion of the participants' health insurance type was new-type rural cooperative medical insurance, with 49.53% of the participants insured, followed by medical insurance for urban residents (MIUR), with 28.32% of the participants insured. The demographic information of the survey participants is summarized in Table 1.

Main reasons for choosing the hospital

Figure 1 recorded the respondents' main reasons for choosing the hospital. The top four reasons were: high level of medical treatment, good reputation of the hospital, advanced medical equipment, and recommended by acquaintances.

The most unsatisfactory items for the hospital that served them

Figure 2 records the respondents' most unsatisfactory items for the hospital that served them. The top four items were: long time to wait for treatment, complicated formalities, poor overall service attitude, and provided unnecessary service.

Analysis of the demographic factors affecting patient satisfaction

The population with the highest and lowest satisfaction was selected according to the 80/20 rule. We found that 20.14%

Table 3 Logistic regression analysis of influencing factors associated with patient satisfaction (for highest score group)

Demographic factors	Scored 8–9 (n=250, 29.62%)	Scored 1–7 (n=594, 70.38%)	Crude OR (95% CI)	Adjusted OR (95% CI)
Gender				
Male	124 (30.85)	278 (69.15)	–	–
Female	126 (28.51)	316 (71.49)	1.12 (0.83–1.50)	1.14 (0.83–1.57)
Age (years)				
≤25	69 (25.27)	204 (74.73)	–	–
26–45	81 (28.03)	208 (71.97)	0.87 (0.60–1.26)	0.78 (0.44–1.43)
46–65	83 (38.60)	132 (61.40)	0.54 (0.37–0.79)**	0.63 (0.33–0.98)*
>65	17 (25.37)	50 (74.63)	1.00 (0.54–1.84)	1.37 (0.60–3.11)
Education level				
≤Elementary school	110 (34.27)	211 (65.73)	–	–
Middle/high school	67 (32.84)	137 (67.16)	1.07 (0.74–1.55)	1.05 (0.70–1.58)
Associate's/bachelor's degree	36 (17.14)	174 (82.86)	2.52 (1.65–3.86)***	2.40 (1.37–4.20)**
≥Master's degree	37 (33.94)	72 (66.06)	1.01 (0.64–1.61)	0.95 (0.50–1.83)
Marital status				
Married	170 (31.31)	373 (68.69)	–	–
Others	80 (26.58)	221 (73.42)	1.26 (0.92–1.72)	0.96 (0.53–1.76)
FPMI (CNY)				
≤3,000	136 (33.33)	272 (66.67)	–	–
3,001–5,000	92 (28.57)	230 (71.43)	1.25 (0.91–1.72)	1.15 (0.80–1.66)
5,001–7,000	17 (23.94)	54 (76.06)	1.59 (0.89–2.84)	1.22 (0.64–2.33)
>7,000	5 (11.63)	38 (88.37)	3.80 (1.46–9.87)**	3.02 (1.10–8.33)*
Household registration				
City	87 (30.10)	202 (69.90)	–	–
Countryside	163 (29.37)	392 (70.63)	1.04 (0.76–1.41)	1.28 (0.84–1.94)
Type of patient				
Outpatient	134 (26.43)	373 (73.57)	–	–
Inpatient	116 (34.42)	221 (65.58)	0.68 (0.51–0.92)**	0.70 (0.54–0.97)*
Type of health insurance				
MIUR	80 (33.47)	159 (66.53)	–	–
NRCMI	123 (29.43)	295 (70.57)	1.21 (0.86–1.70)	1.57 (0.96–2.56)
MIUW	37 (25.52)	108 (74.48)	1.47 (0.93–2.33)	1.43 (0.84–2.45)
CMI	10 (23.81)	32 (76.19)	1.61 (0.75–3.44)	1.56 (0.70–3.48)

Notes: *$p<0.05$, **$p<0.01$, ***$p<0.001$.
Abbreviations: FPMI, family per-capita monthly income; MIUR, medical insurance for urban residents; NRCMI, new-type rural cooperative medical insurance; MIUW, medical insurance for urban workers; CMI, commercial medical insurance; OR, odds ratio; CI, confidence interval.

of the respondents scored 1–5 points (lowest satisfaction) and 29.62% scored 8–9 points (highest satisfaction). In order to better understand the bivariate and multivariate associations of patient satisfaction versus demographic factors such as age, gender, education level, marital status, FPMI, household registration, type of patient, and type of health insurance, we obtained the CORs and AORs by implementing univariate and multivariable logistic regression models, respectively.

Analysis of the lowest score group showed that in the univariate logistic regression model, there was a higher proportion of patients with lowest satisfaction who had an associate's or bachelor's degree (COR =0.69, 95% CI =0.45–0.99), as compared to those with a ≤elementary school educational background, and a lower proportion of patients with a middle or high school educational background (COR =1.71, 95% CI=1.04–2.80). Compared to those with an FPMI ≤3,000 CNY,

more patients with an FPMI >7,000 CNY were detected in the lowest satisfaction group (COR =0.36, 95% CI =0.19–0.69). Besides, a lower proportion of inpatients (COR =1.41, 95% CI =1.01–2.01) was also found in the lowest satisfaction group. Multivariable logistic regression model reported that a lower proportion of female patients (AOR =1.47, 95% CI =1.03–2.11), patients with an FPMI between 3,001 and 5,000 CNY (AOR =1.40, 95% CI =1.01–2.17), and inpatients (AOR =1.46, 95% CI =1.01–2.13) scored 1–5 points. In addition, a higher proportion of patients with the highest FPMI >7,000 CNY showed the lowest satisfaction (AOR =0.43, 95% CI =0.20–0.92) (Table 2).

On the other hand, in terms of the analysis for the highest score group, both univariate logistic regression model and multivariable logistic regression models demonstrated that inpatients were more satisfied with the received medical

service (COR =0.68, 95% CI =0.51–0.92; AOR =0.70, 95% CI =0.54–0.97) as compared to outpatients. When compared to younger individuals aged ≤25 years, patients aged 46–65 years (OR =1.61, 95% CI =1.39–2.98) were more satisfied with the received medical service (COR =0.54, 95% CI =0.37–0.79; AOR =0.63, 95% CI =0.33–0.98). However, those with an associate's or bachelor's degree showed a lower proportion of the highest satisfaction (COR =2.52, 95% CI =1.65–3.86; AOR =2.40, 95% CI =1.37–4.20). Top earners with an FPMI >7,000 CNY also showed a lower proportion of the highest satisfaction (COR =3.80, 95% CI =1.46–9.87; AOR =3.02, 95% CI =1.10–8.33) (Table 3).

Discussion

The present study found that the top four reasons why migrant patients prefer a certain hospital are: high level of medical treatment, good reputation, advanced medical equipment, and recommendation from a friend or family member. The most significant criteria for patients when choosing a hospital were its service and its reputation. The better a facility's service is and the greater its reputation, the more patients were willing to receive medical treatment there. Improvement of the quality of medical service remains the core part of a hospital's development, which may be further facilitated by better medical equipment.[35,36] Only through expanding a hospital's medical treatment capabilities, can more people actually be cured and be more satisfied with their medical experience, thereby attracting more patients to visit. Managers of medical facilities should also note the importance of increasing their publicity through a rapidly developing media, as well as the necessity of creating a more patient-friendly medical experience, which will lead to more recommendations from patients to potential patients.

Moreover, the results of our study showed that the top four reasons why ecdemic patients were dissatisfied with their experience at a hospital were long waiting times, complicated formalities and paperwork, poor overall service attitude, and provision of unnecessary services. Among these factors, long waiting times is the most significant one; the number of respondents who selected this option exceeds that of respondents who chose the other ones to a very large degree. The significance of this factor may be explained by the fact that ecdemic patients are already burdened with non-medical costs including travel and accommodation during their trip, and long waiting times will increase such costs.[4,7,26,37] The uneven distribution of health care resources, with the best medical facilities and equipment concentrated in large cities and large hospitals, may be the primary cause for long queues.[26] Another reason for long waiting times may be that the increased specialization of medical services into professional clinical departments has complicated and elongated the treatment processes. A possible solution to this is the incorporation of Internet technology into medical service. Moreover, studies have shown that job satisfaction of medical staff affects the quality of their service and subsequently patient satisfaction, especially when the staff works under fatigue.[38,39] Managers of health care facilities should incentivize their employees and improve their working experience through discreet management and the prevention of working overloads.[40,41]

Using the 80/20 rule, we especially examined the highest and lowest 20% groups of satisfaction scores. Because the distribution of satisfaction scores skewed in a direction such that it was concentrated around 6 and 7 points, we found 20.14% of the respondents scored 1–5 points (lowest score group), and 29.62% scored 8 or 9 points (highest score group). We investigated whether there were patterns in the demographic information of respondents in the lowest and highest score groups, such that we may identify population groups that the managers of hospitals should especially focus on.

It was found that patients with an FPMI between 3,001 and 5,000 CNY had a higher degree of satisfaction than those with an income below 3,000 CNY. Patients with an FPMI above 7,000 CNY reported an even lower satisfaction score than the population group with an income below 3,000 CNY. Moreover, female patients and inpatients were more satisfied with their medical experience than male patients and outpatients, respectively. The low degree of satisfaction among low-income patients may be due to the fact that constraints in their financial resources make it difficult to pay high treatment costs. Those with higher income are more likely to be dissatisfied, as they have higher demands for health care. In several previous related studies, researchers have demonstrated that female patients had a lower degree of satisfaction than males.[19,21,22,26,42,43] This study, however, detected fewer female patients in the lowest satisfaction group, and yet statistically significant differences between male and female groups were also not found in the highest satisfaction group.

Inpatients were more contented with the medical care that they received, partly due to pronounced effects that they experienced during their long-term stay at a hospital, and partly due to the formation of cordial relationships with staff and increased familiarity with the facility. Therefore, hospitals

should focus on the medical experience of patients with relatively lower and higher income levels. Some practical measures include: simplifying procedures for claiming reimbursements, providing guidance for low-income patients on such formalities, avoiding prescribing unnecessary treatments to decrease their financial burden, and identifying the expectations and demands of patients with higher income in advance. Moreover, the information desk in each hospital should be fully utilized such that the service for patients is proactive rather than passive. Hospitals should provide navigation for patients to receive examinations or treatments and guide them through any complicated procedures.

Finally, the following limitations can be identified in this study. The confounding factors of patient satisfaction are possibly more than those we investigated. Other factors that may be examined include the distance between the hometown and destination location of ecdemic patients, the type of disease, duration of disease, comorbidities, different clinical department in which a patient receives their treatment, and so on. Since the study was based on a strategy of convenience sampling, such a design may be affected to some extent by sampling bias. Thus, data should be weighted using variables related to the population of reference to achieve better representativeness of the population. However, there were no related previous survey experiences with the sampling frame among this population in China, and the general population characteristics remained unknown. Therefore, we did not weight the data in the present study. Furthermore, the geographic scope of the study was limited. Moreover, the biases related to the face-to-face interviews and non-response bias were not assessed, as only those agreeing to participate were included. Thus, application of the findings to other areas throughout China needs to be done with caution.

Conclusion

This study has clearly shown that the ecdemic patients were more willing to receive the ecdemic medical care in a certain hospital with a high level of medical treatment, good reputation, and advanced medical equipment. Ecdemic patients were mainly dissatisfied with the long waiting times for care, complicated formalities, a poor overall service attitude, and provision of unnecessary services. Fewer female patients, patients with an FPMI between 3,001 and 5,000 CNY, and inpatients were found in the lowest satisfaction group. Fewer patients with an associate's or bachelor's degree, and top earners with an FPMI >7,000 CNY, were detected in highest satisfaction group. Those aged 46–65 years were mainly detected in the highest satisfaction group. The findings from this study suggested that managers of the medical facilities

should note the importance of increasing their publicity through a rapidly developing media, as well as the necessity of creating a more patient-friendly medical care experience. Hospitals should also focus on the medical care experience of patients with relatively lower and higher income levels, male ecdemic patients, and ecdemic outpatients. The information desk in the hospital should be fully utilized such that the service for patients is proactive rather than passive. The information desk should provide navigation for patients to receive examinations or treatments and guide them through any complicated procedures. Hospitals and the physicians should actively and truly practice patient-centered care to improve the patients' clinical outcomes, quality of the doctor–patient relationship, and patient satisfaction.

Author contributions

All authors have approved the content of the submitted manuscript. Dr Xiaojun Liu and Prof Zongfu Mao conceived and designed the study; Dr Xiaojun Liu and research team partners from other units collected data; Dr Xiaojun Liu, Hanson Lu, Yanan Wang, Wenjie Wang, Anran Tan, and Zhaoxun Hou contributed to data analysis and wrote the manuscript; Prof Zongfu Mao, Dr Xiaojun Liu, and Hanson Lu revised the manuscript.

Disclosure

The authors report no conflicts of interest in this work.

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