ORIGINAL RESEARCH

Satisfaction survey among primary health care outpatients in the backward region: an empirical study from rural Western China

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Background: With a growing health demand, patient satisfaction analysis is essential for evaluating the accessibility and performance of medical services. Previous studies had explored the Chinese outpatient satisfaction and influencing factors in developed areas and tertiary hospitals. Considering the lower education level, less income, and heavier economic burden, it was necessary to conduct a region-specific questionnaire survey for the outpatient's satisfaction in rural Western China.

Objective: To analyze the satisfaction of primary outpatient service in rural Western China, and explore the factors affecting outpatients' satisfaction.

Methods: Questionnaire composed of nine 5-Likert items was applied to survey outpatient satisfaction among randomly selected samples in 11 provinces of Western China. Exploratory factor analysis (EFA) was conducted to study the factor structure of questionnaire. Stepwise multiple linear regression analysis was performed to study the influencing factors.

Results: A total of 2,754 outpatients completed the questionnaire, the response rate was 88.7%. Respondents were most satisfied with medical staff service attitude (3.71±0.83) and least satisfied with medical cost (2.97±0.83). A 3-factor solution was adopted in EFA to explain the overall satisfaction. Factors identified were "Service attitude", "Facility and professional skills", and "Patients' cost". And, the questionnaire was proved to have good reliability and acceptable internal consistency. The stepwise multiple linear regression analysis results presented that factors, including sample hospital type ($P<0.05$), age ($P<0.001$), education level ($P<0.05$), occupation ($P<0.01$), monthly income ($P<0.05$), and chronic disease conditions ($P<0.01$) were significantly associated with the dimensional or overall satisfaction.

Conclusion: The primary health care outpatient satisfaction in rural Western China is lower than developed areas and tertiary hospitals. Care providers in backward regions should pay more attention to patients' demographic characteristics and health status, to meet outpatients' actual demand. Efficient hospital management methods, modern technology, and staff training are needed to improve the service quality and care efficiency.

Keywords: outpatient satisfaction, factor analysis, stepwise multiple linear regression, county-level hospitals, backward regions, Western China

Introduction

Patient satisfaction is consumers' evaluation about the effectiveness, safety, and benefit of health care service, which is a combination of patients' experience and perception.[1–3] Patient satisfaction is an important and commonly used indicator for measuring the quality of health care, and higher patient satisfaction would lead to better clinical outcomes and less care resource utilization. Therefore, patient satisfaction survey is essential for patients, health care provider, and health care payer.[4–6]

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Most patient satisfaction studies were conducted in the USA and European countries, suggesting that patients in the flourishing regions tend to evaluate the quality of health care service based on waiting time, medical staffs' proficiency, hospital environment, and participation in the medical decision making.[3,4,7–10] There are several recent patient assessment studies, which were conducted in developing countries, including India, Thailand, Tanzania, and Ethiopia. Patients in these countries care more about the location of health facility, hospital comfort, and access to appropriate services.[11–15] Patients perception varies according to education level, age, income, and residence.[15]

As proposed in previous literature,[16] with the increasing population and patient expectation, patient satisfaction analysis is essential to evaluate the accessibility and quality of medical service, especially in developing countries, such as China. Some researchers had explored the outpatient satisfaction and factors affecting Chinese patients' satisfaction, mostly from developed provinces or tertiary hospitals, performing descriptive analysis and satisfaction ratings survey.[17,18] Questionnaire is a commonly used satisfaction survey instrument. As reported in studies conducting univariate or regression analysis, factors, including hospital environment, medical facility, service attitude, patients' involvement in decision making, doctors and nurses' proficient skills, effective communication between patients and doctors, disease severity, medical cost, waiting time, and service time were associated with Chinese outpatients' satisfaction in advanced areas or tertiary hospitals.[19–23] Similar results were also previously demonstrated in Hong Kong and Taiwan studies.[24–26]

According to Grossman (1973),[27] patients' demand for medical services is associated with demographic characteristics and socioeconomic conditions; therefore, patients' demand and satisfaction in backward areas should be measured in a different way from developed areas.[28] So far, no questionnaire studies have been designed to assess primary health care outpatient's satisfaction with a large-sample evidence covering different backward provinces in China. Considering the relatively lower education level, less individual income, and heavier economic burden, it is necessary to process a region-specific questionnaire survey for the outpatient's satisfaction in rural Western China. Consequently, the objective of this study was to conduct a satisfaction survey in primary outpatient service in rural Western China and explore the factors affecting outpatients' satisfaction.

Materials and methods

This research was approved by the research ethics committee of Institute of Chinese Medical Sciences, University of Macau.

Questionnaire development

The initial questionnaire draft was designed based on the literature review, and the literature search was conducted using CNKI and PubMed database in June 2014, by keywords including "outpatient", "satisfaction", "China" and "questionnaire". More than 50 previous outpatients' satisfaction survey and relevant studies were screened, and the adaptive information was extracted to compose the item pool. And, local medical price, reimbursement percentage, residents' income, and education level were considered during the pilot study. According to the pilot study results and local physicians' advice, the final draft version contains 9 items, including time spent in commuting to hospital, waiting time, doctors' disease description, patients' participation in decision making, staff service attitude, hospital facility, hospital environment, medical cost, and doctors and nurses' professional skills. Interviewees were also asked to fill their background information, including age, gender, occupation, education level, monthly income, medical insurance type, and condition of chronic diseases.

The questionnaire was designed as a 5-point Likert scale,[29] and interviewees were asked to rate each item: very dissatisfied (1), dissatisfied (2), neither satisfied nor dissatisfied (3), satisfied (4), and very satisfied (5).

Sampling

Eleven provincial-level divisions in Western China were selected to explore the outpatient satisfaction, including Ningxia Hui Autonomous Region, Guangxi Zhuang Autonomous Region, Xinjiang Weiwuer Autonomous Region, Gansu Province, Shaanxi province, Qinghai province, Sichuan province, Guizhou Province, Yunnan Province, Inner Mongolia, and Tibet Autonomous Region. In each province, all counties were divided into 3 levels by GDP per capita, and 1 sample county was randomly selected from each level of 11 provinces. The county general hospital, maternal and child health center, and hospital of Traditional Chinese Medicine in each sample county were recruited as sample hospitals. Fifty outpatients drawn randomly from each sample hospital were enrolled into the study, receiving the questionnaire when leaving the hospital. Written informed consent was obtained from all interviewees before filling the questionnaire. All questions were explained by trained investigators.

The questionnaire for interviewees aged <14 years was answered by their adult supervisor.

Statistical analysis

The missing item and total response rates were used to assess the questionnaire acceptability and feasibility. Descriptive data were tabulated to present participants' demographic and other background characteristics. Exploratory factor analysis (EFA), using principal component analysis and varimax rotation, was conducted to assess the dimensionality of overall satisfaction, evaluate the structure validity, and reduce the number of variables.[30–32] Multiple linear regression analysis in a stepwise method (p for removal was set at 0.1 and p for entry at 0.05) was implied to explore the association between outpatients' characteristics and satisfaction factor scores. Outpatients' background characteristics that showed significant difference in univariate analysis were included as independent variables, with dimensional and overall factor scores as dependent variables.

All data analysis was performed using SPSS version 19.0.

Results

The questionnaire survey was conducted from October to December 2014. A total of 3,193 patients participated in the survey, and 2,754 questionnaires were fully completed. The missing value rate for each item was 0.2%–0.5%, and the total response rate was 88.7%, indicating that the questionnaire was acceptable and feasible.

Descriptive findings

The descriptive results of participants' demographic and other background characteristics are presented in Table 1. The mean age of respondents was 36.86 (SD=14.30), 40% were female, and 60% were male. Only 40% of interviewees had completed at least high school education. Farming was the most common occupation, and 70.4% of responders' income was <2001 yuan (~330 USD) per month. Most participants were enrolled in public medical insurance, 14.6% of respondents were insured by Urban Employee Basic Medical Insurance (UEBMI), 9.5% by Urban Resident Basic Medical Insurance (URBMI), and 60.2% by New Rural Cooperative Medical Scheme (NRCMS). A total of 20% of the participants had chronic diseases.

Outpatients satisfaction item scores

The results of the outpatients' satisfaction survey are shown in detail in Table 2. According to the mean scores, respondents were most satisfied with medical staff service

Table 1 Respondents' characteristics and descriptive findings

Characteristics	N (%)
Age, mean (±SD)	36.86 (±14.30)
Gender	
Female	1,101 (40.0)
Male	1,653 (60.0)
Education	
Illiteracy	287 (10.4)
Primary school	503 (18.3)
Junior high school	887 (32.2)
High school	638 (23.2)
College or above	439 (15.9)
Occupation	
Farmer	923 (33.5)
Blue-collar worker	328 (11.9)
Business/service/enterprise employee	474 (17.2)
Teacher/governments or public-sector staff	295 (10.7)
Student/unemployed/other jobs	679 (24.7)
Retirement	55 (2.0)
Monthly income (RMB)	
No income	689 (25.0)
1–2,000 yuan	1,250 (45.4)
2,001–4,000 yuan	655 (23.8)
4,001 yuan and above	160 (5.8)
Medical insurance	
National health insurance	96 (3.5)
UEBMI	402 (14.6)
URBMI	261 (9.5)
NRCMS	1,658 (60.2)
Urban and rural residents medical insurance	73 (2.7)
Other insurances	53 (1.9)
No medical insurance	211 (7.7)
Chronic diseases	
Yes	550 (20.0)
No	2,204 (80.0)

Abbreviations: UEBMI, Urban Employee Basic Medical Insurance; URBMI, Urban Resident Basic Medical Insurance; NRCMS, New Rural Cooperative Medical Scheme.

attitude (3.71±0.83) and second, doctors' disease description (3.64±0.84). Medical cost was the least satisfactory item (2.97±0.83). The sum of mean scores of 9 items was 30.58, with the maximum score of 45, which was relatively lower than the average satisfaction scores in previous studies.

Factor analysis

EFA was conducted to explore the dimensionality of the overall outpatients' satisfaction in rural Western China and analyze the validity of the dimensional structure.

The overall Cronbach's α value was 0.75, suggesting good reliability. The Kaiser–Meyer–Olkin measure for the dataset was 0.804, the Bartlett's test was 6,002.289 ($P<0.001$), and all item-total correlations exceeded 0.50, implying that the data were adequate for EFA.[31–33]

Principal component analysis and varimax rotation were adopted. As shown in Table 3, only 2 factors had

Table 2 Outpatients satisfaction item scores

	Contents	Very dissatisfied, N (%)	Dissatisfied, N (%)	Neither satisfied nor dissatisfied, N (%)	Satisfied, N (%)	Very satisfied, N (%)	Mean ± SD
X_1	Time spent commuting to hospital	114 (4.1)	371 (13.5)	1,217 (44.2)	774 (28.1)	278 (10.1)	3.27±0.96
X_2	Waiting time	169 (6.1)	559 (20.3)	1,249 (45.4)	584 (21.2)	193 (7.0)	3.03±0.97
X_3	Doctors' disease description	42 (1.5)	117 (4.2)	1,038 (37.7)	1,153 (41.9)	404 (14.7)	3.64±0.84
X_4	Patients' participation in decision-making	93 (3.4)	127 (4.6)	1,016 (36.9)	1,155 (41.9)	363 (13.2)	3.57±0.90
X_5	Service attitude	32 (1.2)	113 (4.1)	938 (34.1)	1,209 (43.9)	462 (16.8)	3.71±0.83
X_6	Hospital facility	32 (1.2)	216 (7.8)	1,367 (49.6)	879 (31.9)	260 (9.4)	3.41±0.81
X_7	Hospital environment	48 (1.7)	272 (9.9)	1,321 (48.0)	885 (32.1)	228 (8.3)	3.35±0.84
X_8	Medical cost	87 (3.2)	605 (22.0)	1,479 (53.7)	457 (16.6)	126 (4.6)	2.97±0.83
X_9	Doctors and nurses' professional skills	19 (0.7)	90 (3.3)	1,083 (39.3)	1,276 (46.3)	286 (10.4)	3.62±0.84

eigenvalues >1.[34] However, combined with the cumulative variance percentage and scree plot (see Figure 1),[35,36] a 3-factor solution was applied in the factor analysis.

According to the factor loading values, 9 items were explained by 3 dimensions. Factor 1 "Service attitude" consisted of the 3 items of the questionnaire, including patients' participation in decision making, doctors' disease description, and medical staff service attitude. Factor 2 "Facility and professional skills" consisted of hospital environment, hospital facility, and doctors and nurses' professional skills. Factor 3 "Patients' cost" consisted of 3 items, including waiting time, time spent commuting to hospital, and medical cost.

The internal consistency of the matrix was examined. For Factors 1 and 2, the Cronbach's α values were 0.733 and 0.740, respectively, which were considered very good. The inter-item correlation (IIC) can also be adopted as a measure of internal consistency when the number of items in the scale was <10, which was acceptable between 0.2 and 0.4. Thus, the internal consistency of Factor 3 was considered acceptable although the Cronbach's α value was only 0.542.[32,37]

More details of EFA results are available in Table 4.

Factors associated with outpatient's satisfaction

The regression method was used to estimate the factor score coefficients, and the scores of Factor 1 (F_1), Factor 2 (F_2), and Factor 3 (F_3) were produced by SPSS software. To comprehensively explore the characteristics associated with outpatients' satisfaction, the factor score of overall satisfaction (F) was calculated based on the score and variance contribution rate of the 3 main factors:[31,38]

$$F = 0.22872*F_1 + 0.21113*F_2 + 0.18192*F_3$$

Stepwise multiple linear regression was conducted to investigate the factors influencing the 3 main dimensions and the overall satisfaction. Patients' age, sample hospital type, education, occupation, monthly income, medical insurance type, and chronic disease condition showed significant differences in the univariate analysis, thus included in regression model as independent variables, with F_1, F_2, F_3 and F as dependent variables.

Table 5 presents the results of the stepwise multiple linear regression, which demonstrated that the age, sample hospital type, education, occupation, monthly income, and

Table 3 Factor eigenvalues and variance percentage

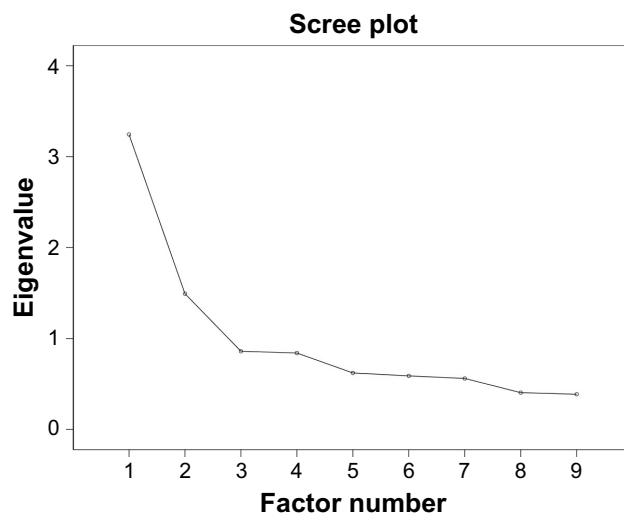| Components	Initial eigenvalue			Rotation sums of square loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.243	36.038	36.038	2.058	22.872	22.872
2	1.493	16.584	52.622	1.900	21.113	43.985
3	0.860	9.555	62.177	1.637	18.192	62.177
4	0.840	9.338	71.515			
5	0.622	6.906	78.421			
6	0.589	6.545	84.966			
7	0.561	6.231	91.197			
8	0.405	4.499	95.696			
9	0.387	4.304	100.000			

Scree plot

Figure 1 Scree plot of eigenvalues.

chronic disease condition were statistically associated with the dimensional or overall outpatient satisfaction.

According to the coefficients and *P*-values, significant differences were observed among different respondent populations in dimensional satisfaction: older outpatients had higher satisfaction score in all 3 dimensions; interviewees from general county hospitals were more satisfied with "Facility and professional skills", but less satisfied with other 2 dimensions than other county hospitals; compared with lower educated patients, respondents who had completed at least junior middle school were more satisfied with "Service attitude" and "Facility and professional skills", less satisfied with "Patients' cost"; outpatients with chronic diseases graded higher in "Service attitude" and "Facility and professional skills"; higher income participants were more satisfied with "Patients' cost", and less satisfied with "Service attitude"; and teachers, governments staff, service industry

workers, business workers, enterprise employee, and retirees, in comparison with farmers, workers, students, and the unemployed, were more satisfied with "Service attitude".

Different respondent populations also had significant differences in overall satisfaction: the overall satisfaction increased significantly with age; interviewees from other county hospitals were more satisfied than those from general county hospitals; outpatients with chronic diseases graded higher overall satisfaction; and higher educated respondents were more satisfied; teachers, governments staff, service industry workers, business workers, enterprise employees and retirees, compared with farmers, workers, students and the unemployed, were more satisfied with overall outpatient health care.

Discussion

Patients' satisfaction is an important and commonly used indicator to analyze the patients' demand, performance, and utilization of medical service. Therefore, patients' satisfaction research is essential in the process of China's health system reform. Although several patient satisfaction reports had been published before, no intensive study was conducted to investigate outpatients' satisfaction with large-sample evidence covering China's backward provinces.

In this research, county hospital outpatients' satisfaction of 11 provinces in Western China were analyzed. A total of 2,754 outpatients completed the questionnaire, and the response rate was 88.7%. Among included respondents, 45.5% were farmers and 60.2% were insured with the NRCMS. According to China's National Health Service Survey (NHSS) report, 2013,[39] Western China residents have lower outpatient satisfaction rate than Middle and Eastern China. Rural residents have higher satisfaction rate with regard to "medical staff" (80.3%–82.7%) than "hospital environment" (67.9%) and

Table 4 Results of EFA

Item	Factors and contents	Loadings	h²	Item-total correlation	Cronbach's α	IIC
	Service attitude (Factor 1)				0.733	0.477
X_4	Patients' participation in decision making	0.840	0.733	0.805		
X_3	Doctors' disease description	0.815	0.729	0.803		
X_5	Staff service attitude	0.588	0.518	0.880		
	Facility and professional skills (Factor 2)				0.740	0.487
X_7	Hospital environment	0.861	0.771	0.797		
X_6	Hospital facility	0.824	0.748	0.794		
X_9	Doctors and nurses' professional skills	0.555	0.520	0.894		
	Patients' cost (Factor 3)				0.542	0.279
X_2	Waiting time	0.796	0.650	0.632		
X_1	Time spent commuting to hospital	0.750	0.572	0.652		
X_8	Medical cost	0.574	0.356	0.789		

Abbreviations: EFA, Exploratory factor analysis; IIC, inter-item correlation.

Table 5 Multiple linear regression results of factors influencing outpatients' satisfaction

Variable	Service attitude (F₁)		Facility and professional skills (F₂)		Patients' cost (F₃)		Overall satisfaction (F)	
	β	P-value	β	P-value	β	P-value	β	P-value
Age	0.003	<0.016*	0.004	0.002**	0.007	<0.001***	0.003	<0.001***
Sample hospital type								
Other county hospitals[a]	–	–	–	–	–	–	–	–
County general hospitals	−0.113	0.003**	0.098	0.011*	−0.147	<0.001***	−0.032	0.018*
Education								
Primary school or less[a]	–	–	–	–	–	–		
Junior middle school or higher	0.197	<0.001***	0.110	0.012*	−0.145	0.001**	0.037	0.029*
Occupation								
Farmer/worker/student/unemployment/others[a]	–	–					–	–
Business/service/enterprise employee/government staff/teacher/retirement	0.167	<0.001***					0.042	0.008**
Monthly income (RMB)								
No income[a]	–	–	–	–	–	–	–	–
1–2,000 yuan					0.164	<0.001***		
2,001 yuan or above	−0.121	0.046*			0.140	0.008**		
Chronic diseases								
No[a]	–	–	–	–	–	–	–	–
Yes	0.204	<0.001***	0.139	0.005**			0.074	<0.001***

Notes: *$p<0.05$, **$p<0.01$, ***$p<0.001$, [a]As reference category.

"waiting time" (70.7%), supporting the results of higher satisfaction in "service attitude", "doctors' disease description" and "medical staff proficient skills" in this paper. "Medical cost" was the least satisfactory item, which had also been previously presented in NHSS report and outpatients' satisfaction study in Beijing.[23,39] In this study, no satisfaction item core exceeded 3.8, less than the overall satisfaction scores (4.67±0.62) for outpatient in tertiary hospitals,[20] the result is consistent with previous references,[40,41] suggesting that outpatients in primary health care in rural Western China were relatively less satisfied with medical service than developed areas or tertiary hospitals.

EFA results showed a 3-dimension structure of overall outpatient satisfaction, "Service attitude", "Facility and professional skills", and "Patients' cost" with 3 items, respectively, and demonstrated acceptable reliability and validity. The stepwise multiple linear regression results indicated that age, sample hospital type, education, occupation, monthly income, and chronic disease condition were statistically associated with dimensional or overall outpatient satisfaction.

The overall satisfaction increased with age, which was agreeable to the report of outpatient satisfaction in Ningxia province and Shanghai.[21,42] Respondents with chronic diseases tended to have higher overall satisfaction, and a similar trend was observed in satisfaction study from developed areas.[23] It is possible that the elderly and chronic patients, compared with the young and patients without chronic diseases, were more experienced and trusted their doctors due to their health status. Participants from county-level general hospital were less satisfied with "Patients' cost" than other county hospitals, since waiting time was reported as the most important item of patient satisfaction in general hospitals,[43] this result was in agreement with the lower overall satisfaction in county general hospital. Outpatients with higher income were more satisfied with "Patient cost" but less satisfied with "Service attitude", predicting the increasing demand for better service attitude with the growing income of Chinese residents. Contrary to previous evidence,[44] although less satisfied with "Patients' cost", better educated outpatients were more satisfied with "Service attitude", "Facility and professional skills", and overall outpatient service. It is probably the accessibility to high-quality medical service rather than the affordability that influence the overall satisfaction of educated outpatients in rural Western China. Teachers, governments staff, service industry workers, business workers, enterprise employees, and retirees had higher overall satisfaction than farmers, workers, students, and the unemployed, which may be related to the stable income and higher reimbursement rate of the former.

Patient satisfaction is a reflection of the residents' health care demand, understanding the demand of patients under different conditions plays a crucial role in improving the performance and efficiency of medical services. There are

similarities and differences between the results in this survey and previous literatures, which suggest that outpatients' health care demand in rural Western China have their own uniqueness. As reported in China's NHSS, 2013,[39] "high medical cost" was the primary cause of rural outpatient dissatisfaction in recent years, and then "poor professional skills" and "bad service attitude". However, considering the association between outpatients' characteristics and satisfaction in this study, primary demand of some rural outpatients has altered from lower price to higher efficiency, better service attitude, and professional skills. Since China has implemented the national Essential Medicines List in 2009 and required no drug profit margins in public hospitals in 2017, a universal access to affordable essential medicines would be promoted in a few years, health care providers should identify and target more initiatives to improve service attitude, environment, and professional skills. In rural Western China, efficient hospital management methods, modern technologies, and more staff training are needed to improve the health care service quality. Implementation of electronic patient record system and consultation desk in each department may reduce the patient queue time and doctor preparation time in general hospitals.[45] More interpersonal communication training would help doctors and nurses in disease explanation and promoting service attitude.[46] Rural primary health care institutions are also suggested to develop more patient education about chronic disease management, promote patient participation, and improve the care efficiency.[47]

Most of published satisfaction questionnaire survey on Chinese patients were single-center study in tertiary hospitals or developed regions,[23,48] conducting regression analysis on mean satisfaction score or satisfaction rate.[21,44] Compared with previous literature, a questionnaire was developed in this study to collect primary health care outpatients' satisfaction score in rural Western China, then EFA and multiple linear regression were conducted to describe the satisfaction dimension and associated factors, exploring rural outpatient satisfaction from another perspective. It is the first outpatient satisfaction questionnaire study based on EFA with multi-province evidence in backward China, and the questionnaire showed acceptable reliability and good feasibility.

Limitations

Although there was a large sample size and reliable results, it should be noted that this study has some limitations: 1) the research sampling was not conducted based on the population distribution of 11 provinces, which may cause the deviation of sample resource. 2) Differences of economic level and medical service quality among 11 provinces were not controlled, by which the satisfaction difference caused could not be explained in this study.

Conclusion

On the whole, the primary health care outpatient satisfaction in rural Western China is lower than developed areas and tertiary hospitals, "Service attitude", "Facility and professional skills", and "Patients' cost" were the main 3 dimensions of overall satisfaction, with significant differences among patients with different demographic characteristics and chronic disease conditions. Local health care institutions should evaluate and manage the outpatient service quality based on the actual need of patients, considering patients' demographic characteristics and health status. Efficient hospital management methods, modern technologies, and staff training are needed to improve the quality of medical service and care efficiency in backward areas.

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Disclosure

The authors report no conflicts of interest in this work.

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