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Original Article

Effects of distance on health seeking behaviors of outpatients in China's large hospitals: case of West China hospital of Sichuan university

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Abstract: This study aim to investigate the effects of distances on health seeking behaviors and medical demands of outpatients in China's Large Hospitals. This paper conducted a questionnaire survey of outpatients' health seeking behaviors and demands in the West China Hospital (WCH) of Sichuan University in December 2014. Multivariate factor-cluster analysis was applied to classify outpatients by using resident location as measurement. Non-parametric tests and descriptive statistical analyses were used to verify the rationality of classification and summarize the different characteristics in distinct groups respectively. Through distanced-based classification, outpatients in WCH were classified into two groups, including short distance (60.66%) and long distance (39.34%). 80% of participants were between 15 and 45 years in the first group, with relative steady jobs, and higher levels of income, education and medical assurance. For the outpatients with long distance, the aging people preferred to visit large hospitals, who had lower levels of income and education, and higher proportion of self-expense. Furthermore, the differences of health seeking behaviors between them were significant, while their service demands had differences as well as similarities. This paper contributes to our understanding of outpatients' different characteristics of health seeking behaviors and health demands at different distances for China's large hospitals. Two different modes of outpatients' health seeking behaviors may increase the discrepancy of health service delivery, and remote outpatients are the most vulnerable people in our medical service system. Therefore, it provides evidence for policy making and reform in health service delivery for remote patients.

Keywords: Health seeking behavior, demand, distance, outpatients

Introduction

Due to the rapid growth of population, medical resources in China are comparatively limited, with disproportional distribution and insufficient medical investment, therefore it causes the great gap between supply and demand. In the meantime, patients with different distances and physical conditions are free to choose whichever levels of providers they can afford. Hence, the large hospitals with scarce resources are often overloaded with various types of patients. The overcrowded situation is the difficult problem that the large hospitals must face, which has posed great challenges to equity of access, quality and efficiency of service delivery [1]. To alleviate congestion and improve the performance of service delivery system, and according to patients' characteristics, the government has introduced a series of policies to help patients to choose proper hospitals, such as guiding patients to seek services at nearby hospitals and establishing referral system for remote patients. In order to have a better and more effective result, we must make clear of two points: what are the health seeking behaviors and service demands among outpatients at different distances (OADD) and what are the differences.

Outpatients' choices are proved to be a complicated decision process, and patients take account of a variety of factors including patients' and providers' characteristics [2-5], and distance remains to be one of the most important factors [2, 3, 6-8]. Hence, exploring patients' behavioral variability in different distances can improve our understanding of outpatients' health care seeking behaviors. The choice behavior literature is largely concerned

Table 1. Demographic distribution

Variable	Descriptor	N	%
Gender	Male	1105	46.96
	Female	1248	53.04
Age	<15 years	46	1.95
	15-30 years	965	41.01
	31-45 years	763	32.43
	46-60 years	394	16.74
	>60 years	185	7.86
Marriage	Single	711	30.22
	Married	1547	65.75
	Divorced	95	4.04
Education level	Do not go to school	14	1.70
	Junior school level or less	429	18.23
	High school level	95	29.71
	College degree or more	141	50.36
Work unit	Government	138	5.86
	Public institution	440	18.7
	Enterprise	591	25.12
	Unemployed	356	15.13
	Others	828	35.19
Monthly income	<2000 Yuan	745	31.66
	2000-5000 Yuan	1205	51.21
	>5000 Yuan	403	17.13
Resident location	In the city	1289	54.87
	In the province	825	35.06
	Outside of the province	234	9.94
Type of medical insurance	Social medical insurance	1285	54.61
	New rural cooperative medical insurance	421	17.89
	Commercial insurance	56	2.38
	Self-expense	591	25.12

with the providers' choices, which is determined by the interplay between patients' and providers' characteristics [3], such as age [4, 5, 9], gender [9, 10], income [11], insurance status [2], health status [12], price [2], waiting time [13], and quality [14]. And distance from household to hospital is one of the most critical influences [2, 3, 6-8]. There exists a negative relationship between healthcare demand and distance, and patients prefer to a provider that is close by [8]. Meanwhile, the impact of distance on choice behaviors varies with each individual due to different demographics [8], socioeconomic background [14, 15] and cognition ability, such as understanding of providers' information and health literacy [16, 17]. So patients would make different tradeoffs between distance and other attributes in their choices, such as quality [18], waiting time [19], hospital size [6] and so on. Besides, an increasing number of studies have focused on individual bypassing behavior to get more knowledge about patients' choices. Patients' attributes, hospital types [20], price and perceived health care quality [21] are proved to affect hospital bypassing. In conclusion, distance is an important factor, but the distance impact can be affected by patient characteristics of demography and socioeconomic background as well as preference of provider characteristics.

What's more, patients have various demands, expectations and preferences of health care service, which partly affect the outpatients' choice behaviors. In a survey of patients in 2007, eight options were found to be the most important aspects of patients' health care, including "fast access to reliable health advice",

Table 2. Health seeking behavior description

Variable	Descriptor	N	%
Medical choices	Visit doctor immediately after illness	865	36.76
	Do not visit doctor immediately	1488	63.24
The type of hospital selection	Community hospitals	205	8.71
	Clinics	358	15.21
	Public hospitals	1761	74.84
	Private hospitals	29	1.23
Experience of incorrect department choice	Choose department correctly	1070	45.47
	Cannot choose department correctly	1283	54.53
Experience of incorrect registering	Register properly	1385	58.86
	Cannot register properly	968	41.14
The registration way	Appointment	1382	58.86
	On the spot	727	30.96
	Both	239	10.18

Table 3. Medical treatment cognition description

Item	Option	N	%
Identify the difference of outpatient and emergency service (OAES)	Yes	1551	65.92
	No	802	34.08
Know the weekend outpatient service (WOS)	Yes	854	36.29
	No	1499	63.71
Know the night outpatient service (NOS)	Yes	1029	43.73
	No	1324	56.27
Know the convenient outpatient service (COS)	Yes	1245	52.91
	No	1108	47.09
Understand the grading treatment policy (GTP)	Yes	877	37.27
	No	1476	62.73
Accept the grading treatment idea (GTI)	Yes	1621	68.89
	No	732	31.11

"effective treatment", "support for family" and so on [22]. The literature also shows that the medical qualification [23], reputation [2], waiting time [8, 24], cost [24] and quality [24, 25] of treatment are the factors patients care most when they are choosing providers. Besides, factors related to the organization of health care positively influence the preference for a provider to some extent, such as whether you can be treated in a convenient time or place [26], and whether a provider is accessible by phone and internet [27]. Therefore, the studies on the identification and differentiation of outpatients' demand can contribute to a further understanding of the behavioral discrepancy of OADD.

Patients' choice behaviors have gained importance in a number of European countries [3], but little attention has been given to the study of choice behavior of OADD in China's large hospitals. Our work moves beyond this prior literature by investigating a much more comprehensive set of outpatient characteristics of behaviors and demands, and aims to answer two issues in China's large hospitals as follows: (1) Are there any differences in health seeking behaviors among OADD? (2) Are there any differences in service demands and preferences among OADD?

Materials and methods

Sample and data collection

The study was conducted using a questionnaire survey in the WCH of Sichuan University, which is a public tertiary teaching hospital in Chengdu,

Table 4. Medical treatment demand description

The primary requirement for seeking medical care	Frequency	%
Trustworthy physician	1206	24.22
Good service attitude	559	11.22
Proper waiting time	202	4.06
Convenience	410	8.23
Reasonable charge	464	9.32
High quality medical technology	1098	22.05
Advanced medical equipment	532	10.68
The quality of the drug	405	8.13
Fixed-point units	104	2.09
Total	4980	100
The primary requirement for visiting doctors	Frequency	%
Acquaintances recommend	507	20.2
Expert or professor	1249	49.76
Other requirements	646	25.74
Indifferent	108	4.3
Total	2510	100
The major cause of choosing general hospital	Frequency	%
Do not trust the medical level of grass-roots	284	10.75
Early diagnosis and treatment	624	23.61
To solve the long treatment	184	6.96
Clarify diagnosis	1519	57.47
Unclear	32	1.21
Total	2643	100
The response to difficult registration	Frequency	%
Seek for help from staff	1879	79.35
Find scalpers	126	5.32
Keep waiting	250	10.56
Turn to other hospitals	113	4.77
Total	2368	100
Accompany requirement		
Need	973	41.35
Do not need	1380	58.65
Total	2353	100

China. WCH served about 4.9 million outpatients and emergency attendances in 2014. According to its internal statistical analysis on outpatient amount in 9 common and main specialty care units, the proportion of outpatients living out of Chengdu city reached 51.58% in 2014.

The data set was collected in December 2014. In all, 3000 questionnaires were distributed to the outpatients randomly in the waiting area of WCH's outpatient department by training clinic nurses, and 2353 of them were effectively collected and eligible for data analysis (valid response rate 78.4%). And the research had got the approval and consent from Biomedical Ethics Committee of WCH.

Questionnaire design

Under the participation of hospital managers and physicians, the questionnaire was designed according to the two research questions. We drew on literature summarization and expert interview to identify outpatients' health care seeking behaviors in two dimensions, which were the health seeking behaviors before entering hospital (whether seeking doctors after being illness and the provider choice) and the treatment seeking behaviors in the hospital (the choices of departments and doctors, and the registration ways). And based on previous studies, we used individual's demographic characteristics, socioeconomic backgrounds and cognition ability as factors of health care seeking behaviors. Finally, the questionnaire was made up of four parts: (1) demographic characteristics and socioeconomic backgrounds covering gender, age, occupation, income, marriage, education, resident location and insurance status (**Table 1**); (2) outpatient behaviors including health seeking behaviors and internal treatment seeking behaviors (**Table 2**); (3) medical treatment cognition of different outpatient services (**Table 3**), including outpatient and emergency service (OAES), weekend outpatient service (WOS), night outpatient service (NOS) and convenience outpatient service (COS), as well as the awareness and recognition of the grading treatment policy (GTP); (4) healthcare demands (**Table 4**) including health care requirement, the main reason of choosing large hospitals and seeking doctor, the response to difficult registration and the accompany requirement. In the second and forth parts, every question provided several options getting through summarizing literatures and

Table 5. Non-parametric test results

P-value	Health seeking behaviors			
	Medical choice	Department choice	Proper registration	The registration way
Gender	0.039*		0.038*	0.038*
Marriage	0.000*	0.004*		
Age	0.000*			0.090*
Occupation	0.000*	0.000*		
Education	0.000*	0.003*		
Resident location	0.017*		0.000*	0.000*
Monthly income	0.006*	0.000*		
Insurance status	0.006*	0.033*	0.027*	0.027*

*Indicates the statistical significance under the condition of α=0.05.

experts consultations. And the questionnaire was reviewed and approved by WCH in advance.

Procedure

Descriptive statistical analysis, different statistical tests, correlation analysis and factor-cluster analysis were used. Firstly, the non-parametric test was undertaken to explore the influence of distance on several aspects of outpatients' characteristics, including health seeking behavior, treatment seeking behavior and medical treatment cognition (**Table 5**). On this basis, correlation analysis (**Table 6**) and multivariate factor-cluster analysis (**Table 7**) were applied to identify and classify the outpatients with different characteristics by using resident location as measurement. Then, Mann-Whitney U and H tests were conducted to verify the classification rationality (**Table 8**), while descriptive statistical analysis was applied to summarize the outpatient different characteristics in distinct groups (**Tables 9**-**12**). All analyses were performed by SPSS software for Windows. A *P*-value <0.05 was considered significant.

Statistical analysis

All the statistical analyses were performed using the SPSS statistical package 17.0 (SPSS, Chicago, IL, USA). Categorical data were examined using the χ^2-test. Two side *P*-values less than 0.05 were considered statistically significant.

Results

Sample characteristics

The description of the demographic data of the study's sample was shown in **Table 1**. Of the 2353 participants involved in the study, 53% of participants (n=1248) were female, 73% of participants (n= 1728) were between 15 and 45 years of age, and more than half of the sample worked in the government, institutions and enterprises. In the total population, just over half of participants had college or higher educational background and a monthly income of 2000-5000 Yuan. 55% of participants came from the city, and 54% of participants enjoyed the social insurance of medical care.

Table 2 showed the detailed choice behavior information. In the total population, only 37% of respondents would go to a doctor immediately after illness. In the treatment process, 69% of participants made appointment by phone, self-service machine or online, and nearly half of respondents had the experience of incorrect registration (41.2%) and entering the incorrect department (54.53%).

Table 3 showed the description of the sample data on medical treatment cognition. The awareness rate of OAES was 66%, while the rate of COS was 53%. By contrast, more respondents had poor understanding of WOS, NOS and GTP.

In the aspect of healthcare demand, the detailed description was presented in **Table 4**. Outpatients were more concerned about medical quality when they sought health care, including the high specialist skill, the good service attitude and the advanced medical equipment. Meanwhile, 57% of participants selected the option of confirming diagnosis to be the primary concern for choosing the general hospital, and 50% of participants considered qualification and experience as the most important selection criterion to choose doctors. Also, 41% of participants made it clear that they needed companion in the process of seeking medical service.

Distance difference test

The *P* values of Mann-Whitney U and H tests were presented in **Table 5**. This indicated that outpatients with different demographic and socioeconomic attributes had different health care seeking behaviors and medical treatment

Table 6. Correlation test results

Pearson correlation	Age	Marriage	Education	Income	Insurance type	Medical choice
Resident location	0.115*	0.104*	-0.188*	-0.072*	0.233*	0.074*
Pearson correlation	Registration way	Knowledge of WOS	Knowledge of NOS	Knowledge of COS	Knowledge of GMP	
Resident location	0.054*	0.068*	0.06*	0.115*	0.051*	

*Indicates the statistical significance under the condition of α=0.05.

Table 7. Component matrix

Pattern matrix	Factor			
Item	1	2	3	4
Age	0.269	0.767	0.129	-0.016
Marriage	0.206	0.79	0.268	-0.0065
Education	-0.485	-0.408	0.531	0.102
Income	-0.223	0.092	0.747	0.219
Insurance type	0.369	-0.105	-0.442	0.134
Knowledge of WOS	0.691	-0.24	0.179	0.113
Knowledge of NOS	0.686	-0.182	0.247	0.117
Knowledge of COS	0.605	-0.209	0.098	0.063
Knowledge of GMP	0.596	-0.196	0.219	0.001
Medical choice	0.079	0.424	-0.122	0.561
The registration way	0.178	-0.043	0.14	-0.772
Factor characteristic	Treatment cognition characteristic	Demographic characteristic	Social background characteristic	Behavior characteristic

Table 8. Significance testing

Demographic variable	Age	Occupation	Education	Income	Insurance type
P-value	0.000*	0.000*	0.000*	0.000*	0.000*
Behavior variable	Medical choice	Department choice	Error registration		
P-value	0.000*	0.010*	0.023*		
Cognition variable	OAES	WOS	NOS	COS	GMP
P-value	0.000*	0.000*	0.000*	0.000*	0.000*

*Indicates the statistical significance under the condition of α=0.05.

cognition (P<0.05), and the factor of resident location influenced the majority of those measures remarkably (P<0.05).

Distance-based classification and difference characteristic analysis

Factors extraction: Correlation analysis was conducted to identify the factors which had significant correlations with resident location, and we selected 11 factors as the original variables for factor analysis as shown in **Table 6**. The data was considered suitable for factor analysis following the multiple 'rule of thumbs' that included the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (0.644>0.5) and Bartlett's Test of Sphericity (x^2=3314.556, df=55, p=0.000).

Analysis of the 11 variables revealed four factors with eigenvalues above 1. As shown in **Table 7**, the four resultant factors were descriptively labeled as: treatment cognition characteristic, demographic characteristic, social background characteristic and behavior characteristic.

Cluster analysis: Systematic cluster analysis was applied to analyze the four feature values using the resident location criterion in the origi-

Table 9. Description of different demographic characteristic between two groups

Variable	Characteristic description of group 1	Characteristic description of group 2
Sample size	1420 (60.66%)	921 (39.34%)
Resident location	64% of the sample live in the city.	59% of the sample live outside the city.
Age	Most are young and mid-aged people and 80% of the sample are between 15 and 45.	About one-third of the sample are over age 45 and 70% of total participants over age 70 gather here.
Monthly income	It is a high-to-medium income group that 58% of sample have the monthly income of 2000-5000 Yuan.	It is a middle-low-income group that 53% of sample earn less than 2000 Yuan per month.
Insurance type	61% of the sample have the social insurance.	54% of the sample are self-expense patients and almost one-third have taken part in the new rural cooperative medical system.
Occupation	65% of the sample work in the government, enterprises and institutions.	74% of the sample are jobless or in other situations.
Education level	The group has higher level of education and 68% of them have college or higher.	The group has lower level of education and 76% of those stop at middle school or below.

Table 10. Description of different behavior characteristic between two groups

Variable	Characteristic description of group 1	Characteristic description of group 2
Medical choices	71% of the sampledo not visit doctor immediately after illness.	Nearly half of the sample (48%) visit doctor immediately after illness.
The type of hospital	78% of the sample choose public hospitals.	70% of the sample choosepublic hospitals and 20% choose clinics.
Department choice	48% of the sample can make the right choice.	58% of the sample present they need consultation to get the right choice.
Error registering experience	78% of the sample have barely made the mistakes.	44% of the sample have the wrong experiences.
The way of registration	73% of the sample make an appointment.	Booking registration is also the main way, but 37% of the sample register at the spot.

nal sample. And 3 clusters were considered best-fit for these data. Because the small sample size of the third cluster (n=12), it was ignored in the following discussion.

The first group had 1420 outpatients, and 64% of those were living in the city, while the second group of 921 outpatients was mainly made up of migrants (59%) inside and outside the province. Obviously, the second group members had to travel farther to seek health care service. The results of Mann-Whitney U and H tests were presented in **Table 8**. The *P* values indicated that there were remarkable differences between the two groups with different distances from household to general hospital. The summary descriptions of different characteristics were presented in **Tables 9-11**. Furthermore, comparative analysis was applied to study the similarities and differences in terms of demand factors between different groups which were presented in **Table 12**.

Identification characteristics of behaviors and demands between two groups

The study results showed that the outpatients of general hospital could be divided into two groups according to different travelling distances: short distance and long distance. The people travelling long distance and short distance included in this study with the similar situation of illness. There are different transportations, however, the transportation does not affect the patients' choice. As the results re-presented, 80% of participants were between 15 and 45 in the first group, with relative steady jobs, and higher levels of income, education and medical assurance. For the outpatients with long distance, the contrary was the case. The aging people preferred to visit large hospitals, which had the relative lower levels of income and education as well as the higher proportion of self-expense.

Table 11. Description of different medical treatment cognition between two groups

Variable	Characteristic description of group 1	Characteristic description of group 2
The knowledge of outpatient service	More than half of sample know the special service.	In addition to the outpatient and emergency service, less than half of sample know the other relative service.
The knowledge of grading treatment	45% of the sample know the relative regulation and policy.	Less than one-fourth people are aware of the policy.

Table 12. Analysis of different healthcare demand between two groups

Variable	Common characteristic	Different characteristic of group 1	Different characteristic of group 2
The requirement for seeking medical care	The technique level of physician is the primary cause.	The group people pay more attention to equipment, service attitude and waiting time.	The sample is more concern with reasonable charge and convenience.
The requirement for choosing doctors	The expert and professor is the primary standard.	The group people prefer to visit doctor recommended by acquaintances.	In addition to the experts, the other doesn't matter.
The cause of visiting large hospital	Clarify the diagnosis is the primary cause.	The sample shows more doubts about the level of primary care.	The group people prefer to solve the severe and lingering disease.
The response to difficult registration	The preferred countermeasure is to seek help from the staff.	The group people are easy to turn over to other hospitals.	The sample prefers to keep waiting.
Accompany requirement		48% of the sample do not require it.	54% of the sample express they need friends or family accompany.

The study also showed that there were significant differences between two groups in health seeking behaviors. Outpatients closer to hospitals didn't seek service timely after illness, while outpatients far away from large hospitals preferred to seek service immediately. With better knowledge of medical service process and policy information, the majority of outpatients in the first group (73%) made an appointment to visit hospitals, and most of them could see the doctor independently and accurately. However, a higher proportion (37%) of outpatients in the second group took the registration on the spot. Because of unfamiliarity with the medical procedures and regulations, it was difficult for them to visit doctors quickly and accurately without help from hospital staff. Meanwhile, they also liked to have companion to go for hospitals.

With respect to medical treatment demands, the technique level of physician was the key consideration and the highest priority in both the two groups. Beyond that, the demand characteristics of two groups presented a certain degree of differentiation. The nearer outpatients preferred to pay more attention to these factors such as medical equipment, service attitude and waiting time. However, the farther group appreciated the rational charge and convenience of medical treatment. The results also showed that making definitive diagnosis and selecting experts were the main requirements for both groups to seek service in large hospitals. In spite of this, the differences of two groups could be identified easily. The closer group showed more doubts about the level of primary care and more trust on the doctors recommended by acquaintances, while the farther one preferred to solve stubborn illness and were more willing to seek for experts' services. Moreover, the closer outpatients were more likely to turn to other hospitals when encountering difficulties in registration while those over far distances were prone to keep waiting.

Discussion

This research explored the outpatients' different characteristics of health seeking behaviors and health care demands at different distances. Through distanced-based classification, outpatients in WCH were classified into two groups: short distance and long distance. And the difference of health seeking behaviors between them was significant, while the health demands had some differences as well as some similarities.

In our study, the differences of health seeking behaviors in the two groups were remarkable. Our results demonstrated that outpatients far away from hospital preferred to seek service immediately after being ill, while most of the closer outpatients did not. This conclusion is consistent with the study of Pengqian Fang [4]. In our study, the second group showed less sensitivity to distance, and most of them were in elder age, with lower level of education, working stability and medical security. In general, patients of this type tended to live in relatively poorer environment, having less employment opportunities and much more need for health care. In these situations, distance could be prone to matter less [2]. Moreover, outpatients traveling further to seek medical service probably experienced larger medical expenditure because of extra travel cost, and eventually they were more likely to be in poverty due to the original poor economy. Hence, the second groups should be given more attention and support to promote the equity in health care. In the respect of internal treatment seeking behaviors, the second group of outpatients was easier to have difficulty in choosing department and doctor accurately. An interesting phenomenon could be found by a contrastive analysis of outpatients behaviors before entering hospitals and in the hospitals. Outpatients seeking service immediately were apt to have poor ability of decision-making and experience poor service in the hospital. On the contrary, closer outpatients, who preferred to delay in seeking health service, had a better understanding of healthcare and adopt more effective actions to seek service. Based on Victoor's study, the closer patients could be thought to have ability to actively choose the providers that best fit their preferences and needs, through investing effort in acquiring information [3]. By contrast, outpatients at far distances could be regarded as the selectors of limited ability due to some restrictions imposed by health insurers [28] and age [5]. There were practically realized examples to suggest that this significant behavior differences may partly increase the socioeconomic and educational polarization in the environment of freedom choice [5, 29], and the closer patients with better background were more likely to benefit from their active choices. So in a sense, the complete free choice rules and existing mode of outpatients' choice behaviors may increase inequality to access and discrepancy of health service delivery in China's hospitals.

The study also represented that there were commonalities and differences in outpatients health demands. Obviously, medical quality was the key consideration and the top priority requirement for both groups to seek health care service. Beyond that, the demand characteristics of two groups presented a certain degree of differentiation. Outpatients with short distance cared more about the perceivable factors in course of service, such as medical equipment, service attitude and waiting time. And comparing with the other group, they selected general hospitals more because they showed doubts about the service level of primary care. Instead, outpatients with long distance appreciated the high medical quality and reasonable price, and had a higher loyalty to big hospitals and famous doctors even meeting some difficulties in seeking service. Therefore, these outpatients are the major ones of crowded queue in large hospitals. More efforts and resources should help them to alleviate the pressure of the congestion.

Based on the analysis above, it is not hard to see outpatients far away from hospitals are most vulnerable people in our medical service system. The more benefit they get, the better medical service delivery becomes. Hence, some measures and policies should be considered and adopted to improve the quality and efficiency of health service that they can receive, as well as equality to access. Firstly, more efforts should be done to benefit outpatients from remote areas, such as a better dual referral system, more efficient green channels and a better universal coverage of telemedicine platforms. All of these efforts can promote

the service delivery quality and efficiency by overcoming the distance effect. Secondly, freedom choice of health care can be only beneficial to patients under a range of circumstances, for instance local services are poor [5]. In order to narrow the inequality gap between active selectors and limited ability choosers, patient choice policy needs to be carefully coordinated with other policies designed to improve health services and support the disadvantaged group. The hierarchical diagnosis and treatment policy, and some related reforms associated with medical expenses are just some new attempts which are really to be expected.

There are several limitations in this study. Firstly, the data was only from the WCH, so the results may not be representative of other hospitals. Further research should be carried out for other large hospitals and basic medical institutions. Secondly, the questionnaire design and data collection did not include other factors such as type and severity of disease, leading to certain limitations. Thirdly, the research method was slightly simple, lacking of further discussion and analysis to better explain the motivation for different demands and behaviors based on geographical locations.

In conclusion, this paper contributes to our understanding on outpatients' different characteristics of health seeking behaviors and health care demands at different distances for China's large hospitals. The differences of health seeking behaviors in different distance groups were remarkable, while the health demands had some differences as well as some similarities. Therefore, big hospitals should take measures to better cope with these divergent needs. In addition, the behavior analysis found that the two different modes of outpatients' health seeking behavior may increase the discrepancy of health service delivery, and outpatients far away from hospitals were most vulnerable in our medical service system. Hence, behavior measures and pertinent policies should be considered and adopted to improve the quality and efficiency of health service they can receive, as well as equality to access.

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