



# Patients' Healthcare-seeking Preferences of Pediatric Healthcare Providers in Beijing, China

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**Abstract.** Patients' healthcare-seeking preferences is an important factor in the development of the multi-tiered medical system in China, which especially stress relationship between community health institutions and tertiary hospitals. This study aims to identify influential values forming patients' healthcare-seeking preferences and the underlying factors influencing preference-forming values of pediatric patients. The study distributed 114 questionnaires and 109 were validly completed and returned. The results shows that 98.2% of the participants traveled less than an hour to the institutions, 70.6% of the participants valued medical skill, and 49.5% valued proximity. Company & child relationship, education level, and family income can affect value on medical skill; Family income and values on proximity, medical skill, service attitude, medicine inclusion, and convenience can influence preferences between comprehensive tertiary hospitals and community healthcare institutions; Family income along with value on medical skill, service attitude, and environment can influence whether the patient had any visits to community healthcare institutions within a year; and Relationship, family income, visiting distance, visiting time, wait time in addition to value on proximity, medical skill, and equipment can influence where the participant was surveyed. These results suggest potential in improving pediatric medical resource allocation and community healthcare publicity.

**Keywords:** Multi-tiered medical system, Healthcare-seeking preferences, Pediatrics, Community healthcare, Chinese healthcare system.

## 1 Introduction

China's per capita healthcare expenditure is among the world's lowest, being lower than 1000 dollars while the US spends averagely more than 9000 dollars [1]. While it is impossible to greatly increase expenditure in a short period of time, it is possible to improve the medical system to better efficiency, thus to provide sufficient health care for its citizens and relieve the immense pressure set upon the hospitals and doctors. Among the solutions of promoting efficiency is the construction of a hierarchical system.

In 2015 the General Office of the State Council of China issued a document on promoting construction of a tiered medical system. The document stated that under the

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S. Yacob et al. (eds.), *Proceedings of the 2023 7th International Seminar on Education, Management and Social Sciences (ISEMSS 2023)*, Advances in Social Science, Education and Humanities Research 779,

[https://doi.org/10.2991/978-2-38476-126-5\\_49](https://doi.org/10.2991/978-2-38476-126-5_49)

system there should be clear orientation and close coordination between different levels of hospitals, with primary healthcare conducted in primary healthcare institutions (mostly community healthcare institutions) and bidirectional patient transferal between primary and higher healthcare institutions [2].

The system is not a strict mandatory system. Patients are not required to attend primary healthcare institutions before they visit higher ones. Therefore, the institution a patient visit is completely based on the patient's preference. Due to this complete freedom, it is often observed that many patients ignore all other factors and choose hospitals (particularly tertiary hospitals) merely based on reputation, as was demonstrated with statistics from investigations conducted in Beijing and in Anhui Province [3-5]. Thus, albeit government efforts to publicize primary healthcare institutions, though not without some achievement, primary healthcare institutions including community healthcare institutions often remain underequipped, unpopular, and underutilized, especially in more developed cities like Beijing where higher-level hospitals are abundant, while larger hospitals continue to be overburdened with too many patients.

In order to investigate the underdevelopment of the tiered system, many researchers have dived into the influencing factors of patients' preference when seeking medical care. The pediatric department is one of the parts of the hospitals that are being overburdened. In Beijing, tertiary hospitals hosted 67.5% of pediatric patients in 2017 [6]. Due to the connection between pediatrics and the sensitive subject of childcare, it is logical to suspect a difference between the influencing factors of preference overall and the influencing factors of preference when seeking pediatric care.

Before the survey, the research reviewed literature on the concerning topics. Literature on patient preference in Beijing and other large cities in China including Shanghai were analyzed to provide insights on methodology and produce result expectations. It was found in literature that patient preference may be most strongly connected to the environment, income, technology, costs, proximity, insurance and waiting time [3,4,7-10]. These factors were later reflected in the survey questions during the research.

114 questionnaires were distributed among patients attending the Xicheng and Tongzhou Pediatric department of Beijing Friendship Hospital Affiliated to Capital Medical University, the Tongzhou Maternal & Child Health Center, and the Jiugong community healthcare center. 109 questionnaires were validly completed and returned. The data was inputted and analyzed through SPSS 26, using a Chi-Square test to differentiate relationship between different items. All questionnaires were labeled with a number and the data was revised after the initial input. The investigation aims at analyzing the preference of patients in pediatrics, and it hopes to provide directions and goals for the further development of the tiered medical system in pediatrics, including the development of community healthcare institutions.

## 2 Methods

A survey of outpatients' healthcare provider preferences was conducted at 4 hospital pediatric departments in Beijing in March 2023. Of the 114 questionnaires distributed, 109 were completed and returned (valid response rate = 95.6%). Participants were

selected in during multiple periods, and participated in the survey voluntarily. All selected patients were aware of the aim of the study, and the data remains confidential within the research. The questions were designed to be easily understood and explanations were offered to the patients who had difficulty understanding the questions. A primary survey was conducted before the official survey, and the questionnaire was confirmed to be understandable and the distributors were able to gain experience in engaging participants and explaining questions.

The questionnaire includes 12 items. Item 1 is the participant's relationship with the patient child, which may influence preference by different strengths of relationships with the patients. Item 2-4 are the education level, family income, and payment mode of the participant. These items describe the participant's sociodemographic status. Item 4 uses a multiple-choice question to describe payment method, including the choices of medical insurance (An Old A Child), secondary reimbursement, the new rural cooperative medical insurance, and paid in full. Item 5-8 are proximity, travel time to institution, travel distance to institution, and wait time. These items describe the convenience status to the institution. Item 9 is the reason for the patient's visit. This is meant to divide patients by different severity of illnesses. Item 10 is the Patients preference-forming values for healthcare institutions, a multiple choice that includes advantages in proximity, medical skill, service attitude, equipment, medicine inclusion, convenience and wait time. Item 11-13 are the dependent variables in this research showing preference. Item 11 is the Preferred institution of the patient. Item 12 is Any Visits to Community Hospitals Within a Year. Item 13 is the institution the patient is visiting. The Research view items 1-4 and 10 as determinants of item 11-12, and items 1-10 as determinants of item 13. Furthermore, Items 1-4 will be analyzed as determinants of item 10.

The data were inputted and analyzed using SPSS 26. All questionnaires were labeled with a number and the data was revised after the initial input. The basic characteristics of patients were calculated and arranged into frequency tables, and the relationship between different item were analyzed using the Chi-square test. The alpha value used in this research is 0.05, which means that a p value under 0.05 is statistically significant. Choices of multiple-choice questions were analyzed separately in some parts of the analysis to produce results on how each choices is affected.

## 3 Results

### 3.1 Frequencies in Data

As shown in Table 1, of the 109 participants, 79.8% are the parent of the patient, 14.7% are the grandparent, and 5.5% are of other relationships with the patient. A 79.8% majority of the participants have received a college/junior college or higher levels of education. The participants with a family monthly income higher than 5000 Yuan accounts for 80.8% of all participants, and most participants (75.2%) paid the medical fee via the medical insurance (An Old A Young).

**Table 1.** Basic characteristics of participants

Category	n (%)
Relationship with patient child	
Parents	87 (79.8)
Grandparents	16 (14.7)
Other	6 (5.5)
Education level	
Junior high or lower	5 (4.6)
High school/technical secondary school	17 (15.6)
College/junior college or higher	87 (79.8)
Family income (RMB per month)	
Lower than 5000	10 (9.2)
5000-10000	31 (28.4)
Higher than 10000	68 (62.4)
Payment Mode (Multiple Choice)	
Medical insurance (An Old A Child)	82 (75.2)
Secondary reimbursement	9 (8.3)
The new rural cooperative medical insurance	3 (2.8)
Paid in full	18 (16.5)

As shown in Table 2, travel distances varies, with 29.4%, 41.3%, and 29.4% for shorter than 2 kilometers, 2 to 5 kilometers, and more than 5 kilometers. A majority of 57.8% used private cars to travel. Almost all participants (98.2%) spent less than an hour to travel, and most participants (98.2%) had wait times lower than two hours. most visits (65.1%) were due to fever, coughing, and sneezing.

**Table 2.** Characteristics of the visit during which the survey was conducted

Category	n (%)
Travel Distance (kilometers)	
Shorter than 2	32 (29.4)
2 to 5	45 (41.3)
Longer than 5	32 (29.4)
Means of Transportation	
Public transport	12 (11.0)
Private cars	63 (57.8)
Taxi	16 (14.7)
Walking	7 (6.4)
Bicycles or electric bicycles	11 (10.1)
Travel Time	
Less than 15 minutes	10 (9.2)
15 to 30 minutes	31 (28.4)
30 minutes to an hour	68 (62.4)
More than an hour	2 (1.8)
Wait time	

Less than 30 minutes	70 (64.2)
15 to 30 minutes	30 (27.5)
30 minutes to an hour	7 (6.4)
More than an hour	2 (1.8)
Reason for visit	
Fever	42 (38.5)
Coughing and Sneezing	29 (26.6)
Abdominal pain, diarrhea, and vomiting	15 (13.8)
Growth problems	8 (7.3)
Others	15 (13.8)

As shown in Table 3, half of the participants (49.5%) valued short proximity, a majority (70.6%) valued medical skill, while minorities valued service attitude, environment, equipment, medicine, convenience and wait time.

**Table 3.** Items suggesting preference

Category	n (%)
Preference-forming values	
Proximity	54 (49.5)
Medical skill	77 (70.6)
Service attitude	40 (36.7)
Environment	26 (23.9)
Equipment	23 (21.1)
Medicine	25 (22.9)
Convenience	24 (22.0)
Wait time	19 (17.4)
Preference	
Pediatric specialized hospitals	43 (39.4)
Tertiary hospitals	66 (60.6)
Maternal & Child hospitals	11 (10.1)
Secondary hospitals	1 (0.9)
Community health institutions	16 (14.7)
Private healthcare institutions	1 (0.9)
Community visits last year	
None	36 (33.0)
Any	73 (67.0)
Institution this visit	
Xicheng Department of BFH	56 (51.4)
Tongzhou Maternal & Health hospital	10 (9.2)
Tongzhou Department of BFH	20 (18.3)
Jiugong community healthcare center	23 (21.1)

**3.2 Values on Health-seeking Preference Factors**

As Table 4 shows, Relationship, education levels, and family income influence the skill factor of the preference factors, while whether the participant uses medical insurance in payment can influence the environment and wait time factors of the preference factors.

**Table 4.** Healthcare-seeking values influencing preference factors

Basic characteristics	Proximity $\chi^2$ (n%)	Skill $\chi^2$ (n%)	Service $\chi^2$ (n%)	Environment $\chi^2$ (n%)
Relationship with patient child	6.279 (0.043)	4.108 (0.128) *	5.242 (0.073)	2.429 (0.297)
Education level	2.884 (0.236)	10.453 (0.005) *	4.988 (0.083)	1.728 (0.421)
Family income (RMB per month)	4.117 (0.128)	19.668 (0.000) *	3.504 (0.173)	1.171 (0.557)
Payment Mode (Multiple Choice)				
Medical insurance (An Old A Child)	0.373 (0.541)	2.242 (0.134)	3.237 (0.072)	5.344 (0.021) *
Secondary reimbursement	1.031 (0.310)	0.075 (0.785)	0.885 (0.347)	3.073 (0.080)
The new rural cooperative medical insurance	0.362 (0.547)	2.071 (0.150)	1.788 (0.181)	0.966 (0.326)
Paid in full	0.224 (0.636)	0.944 (0.331)	0.738 (0.390)	1.927 (0.165)
Continued				
Basic characteristics	Equipment $\chi^2$ (n%)	Medicine $\chi^2$ (n%)	Convenience $\chi^2$ (n%)	Wait time $\chi^2$ (n%)
Relationship with patient child	2.798 (0.247)	3.375 (0.185)	0.247 (0.884)	1.806 (0.405)
Education level	2.709 (0.258)	3.292 (0.193)	1.482 (0.477)	0.458 (0.795)
Family income (RMB per month)	4.312 (0.116)	4.530 (0.104)	4.798 (0.091)	1.029 (0.598)
Payment Mode (Multiple Choice)				
Medical insurance (An Old A Child)	2.151 (0.142)	0.396 (0.529)	1.085 (0.298)	4.699 (0.030) *
Secondary reimbursement	2.624 (0.105)	0.776 (0.378)	0.000 (0.988)	2.071 (0.150)

The new rural cooperative medical insurance	0.277 (0.599)	0.189 (0.664)	0.871 (0.351)	0.651 (0.420)
Paid in full	1.292 (0.256)	0.479 (0.489)	0.360 (0.549)	2.113 (0.146)

### 3.3 Influential Factors of Preferred Institutions

As shown in Table 5, Relationship, Education levels, and family income all influence preference of specialized pediatric hospitals. Family income can also influence the participants' preference for community healthcare institutions. Whether the participant uses medical insurance influence the participant's preference for Mother & Child hospitals. value on Proximity influence the preference on community healthcare institutions. value on medical skill influence preference on community hospitals, comprehensive tertiary hospitals and pediatric specialized hospitals. Value on service attitudes influence preference on comprehensive tertiary hospitals. Value on medicine influence preference for comprehensive tertiary hospitals. convenience influence preference for comprehensive tertiary hospitals.

**Table 5.** Influential factors of preferred institutions

	Specialized pediatric hospitals	Comprehensive tertiary hospitals	Maternal & Child Hospitals
Relationship with patient child	12.665 (0.002) *	0.310 (0.856)	2.009 (3.666)
Education level	7.798 (0.020) *	2.710 (0.258)	1.708 (0.426)
Family income (RMB per month)	11.437 (0.003) *	5.318 (0.070)	1.338 (0.512)
Payment Mode (Multiple Choice)			
Medical insurance (An Old A Child)	2.748 (0.097)	0.562 (0.453)	4.028 (0.045) *
Secondary reimbursement	0.154 (0.695)	1.219 (0.270)	1.101 (0.294)
The new rural cooperative medical insurance	2.010 (0.156)	0.048 (0.826)	0.346 (0.556)
Paid in full	2.679 (0.102)	0.338 (0.561)	2.420 (0.120)
Preference-forming values			
Proximity	0.815 (0.367)	1.118 (0.290)	2.427 (0.119)
Medical skill	3.959 (0.047)	10.076 (0.002) *	0.026 (0.873)

Service attitude	0.008 (0.929)	7.600 (0.006) *	0.001 (0.981)
Environment	0.642 (0.423)	2.243 (0.134)	1.468 (0.226)
Equipment	0.856 (0.355)	3.828 (0.050)	0.063 (0.802)
Medicine	0.993 (0.319)	7.468 (0.006) *	0.156 (0.692)
Convenience	0.049 (0.825)	6.688 (0.010) *	0.105 (0.746)
Wait time	0.604 (0.437)	1.662 (0.197)	2.583 (0.108)

Continued

	Secondary hospitals	Community healthcare institutions	Private healthcare institutions
Relationship with patient child	0.255 (0.880)	1.249 (0.536)	0.255 (0.880)
Education level	0.255 (0.880)	4.327 (0.115)	0.255 (0.880)
Family income (RMB per month)	0.609 (0.738)	19.366 (0.000)*	0.609 (0.738)
Payment Mode (Multiple Choice)			
Medical insurance (An Old A Child)	0.332 (0.564)	0.442 (0.516)	0.332 (0.564)
Secondary reimbursement	0.091 (0.763)	1.688 (0.194)	0.091 (0.763)
The new rural cooperative medical insurance	0.029 (0.866)	0.857 (0.355)	0.029 (0.866)
Paid in full	0.200 (0.655)	0.980 (0.322)	0.200 (0.655)
Preference-forming values			
Proximity	0.991 (0.320)	7.543 (0.006) *	0.991 (0.320)
Medical skill	0.419 (0.517)	24.349 (0.000) *	0.419 (0.517)
Service attitude	1.741 (0.187)	1.105 (0.293)	1.741 (0.187)
Environment	0.316 (0.574)	0.014 (0.907)	0.316 (0.574)
Equipment	0.270 (0.603)	2.484 (0.115)	0.270 (0.603)
Medicine	3.391 (0.066)	1.155 (0.282)	3.391 (0.066)
Convenience	3.574 (0.059)	0.931 (0.335)	3.574 (0.059)
Wait time	0.213 (0.644)	0.023 (0.880)	0.213 (0.644)



### 3.4 Influential Factors of Community Healthcare Center (CHC) Visits

As shown in Table 6, whether the patient child have been to community hospitals in a year is influenced by family income, along with value on medical skill, service attitude, and environment.

**Table 6.** Influential factors of whether there were any CHC visits within a year

Factors	$\chi^2$ (n%)
Relationship with patient child	0.027 (0.987)
Education level	2.543 (0.280)
Family income (RMB per month)	7.586 (0.023) *
Payment Mode (Multiple Choice)	
Medical insurance (An Old A Child)	0.002 (0.969)
Secondary reimbursement	0.000 (0.984)
The new rural cooperative medical insurance	1.578 (0.209)
Paid in full	1.138 (0.286)
Preference-forming values	
Proximity	2.878 (0.090)
Medical skill	8.272 (0.004) *
Service attitude	4.848 (0.028) *
Environment	4.805 (0.028) *
Equipment	1.679 (0.195)
Medicine	2.489 (0.115)
Convenience	2.069 (0.150)
Wait time	0.469 (0.494)

### 3.5 Influential Factors of Institution Visiting When Surveyed

As Table 7 shows, relationship, family income, visiting distance, visiting time, wait time along with value of proximity, medical skill, equipment, will influence the visited institution.

**Table 7.** Influential factors of institution visiting when surveyed

Item	$\chi^2$ (n%)
Relationship with patient child	22.254 (0.001) *
Education level	11.866 (0.065)
Family income (RMB per month)	16.568 (0.011) *
Payment Mode (Multiple Choice)	
Medical insurance (An Old A Child)	3.842 (0.279)

Secondary reimbursement	1.632 (0.652)
The new rural cooperative medical insurance	2.920 (0.404)
Paid in full	7.512 (0.057)
Travel distance	21.881 (0.001) *
Means of transport	17.433 (0.134)
Travel time	30.413 (0.000) *
Wait time	17.196 (0.046) *
Reason for visit	19.257 (0.083)
Preference-forming values	
Proximity	10.725 (0.013) *
Medical skill	28.773 (0.000) *
Service attitude	7.267 (0.064)
Environment	2.994 (0.393)
Equipment	8.415 (0.038) *
Medicine	3.439 (0.329)
Convenience	3.218 (0.359)
Wait time	2.393 (0.495)

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## 4 Discussion

The results suggests that a single hospital can attract patients within one hour of travel distance, this provides insight into the geographic allocation of healthcare institutions. Although longer distances, while still within the one-hour range, are shown to be acceptable by many patients, the patients still show significant valuing on short proximity, which is especially important for their tendency to visit community health institutions. The possible reasons for this phenomenon may be the common sense of emergency among parents when acquiring healthcare for their children and the unnecessary of consulting more distanced healthcare institutions when having only minor needs. Community healthcare institutions are in every community, giving them the advantage of short proximity. It is important for community healthcare institutions to effectively serve the minor needs of pediatric patients to ensure that the patients are satisfied and are encouraged to revisit.

Moreover, Results show preference influenced by economic factors. Outpatients in community health institutions only need to pay 1 Yuan after the medical insurance, which most patients have, to get diagnosis. This gives community healthcare institutions the advantage of low prices, which should be kept to continue in encouraging visits.

The results gained from the pediatric division show similarities to the results from more general studies, while results also showed more consideration in service attitudes [3]. This may be due to parents and other participants caring more about how their children are treated. Based on a study in Haidian District in Beijing, patients in fact show

relatively high satisfaction in service attitude, suggesting that bias on community healthcare institutions play a role in the results. To eliminate this biased thinking, it is crucial for the government to further publicize community healthcare institutions, whether by using posters or by hosting community healthcare activities.

Medical skill, equipment, and medicine are also strong influencers of patient preference. Community healthcare institutions generally show a disadvantage in these areas. Medical skill and equipment were the two areas where patients in Haidian District were the least satisfied. Less than 40% of community healthcare institutions' medical staff have had higher education, while in a typical tertiary hospital there is more than 70%. Medicine problems consists of the greatest percentage in the letters and calls concerning community health services in Chaoyang District, mainly due to lack of medicine inclusion [11].

To improve medical skill, further education should be provided to medical staff of community healthcare institutions, including mandatory trials in tertiary hospitals. Pediatrician are often highly pressured with communication difficulty and medical disputes, so a higher salary should be provided to attract better staff [6]. Equipment should be further invested by the government and it is also important to have staff maintain and utilize the equipment. Medicine should be provided according to needs in data collected during medical practice, whereas community healthcare institutions can potentially gain an advantage in this field over higher-leveled hospital with lower prices and greater convenience.

## 5 Conclusion

This research identified influential factors of pediatric patients' health-seeking preferences. Different factors influenced pediatric patients' preference for different healthcare institutions, but those influencing tertiary hospitals and community healthcare institutions are mainly proximity, costs, medical skill, medicine, equipment, and service attitudes. Community healthcare institutions have an advantage in proximity and cost, and the paper advised upon the solidification of such advantages. Community healthcare institutions at a disadvantage in medical skill, equipment, and medicine compared to tertiary hospitals, and pediatric medical resource allocation should be improved to support community healthcare institutions to shorten the gap in these aspects. Service attitudes have been surveyed to be agreeable and publicizing is needed to eliminate biases. Community healthcare institutions do not have to exceed tertiary hospitals in these factors, but they need to develop to attract more patients.

This research hopes to provide directions for solutions in developing the tiered pediatric medical system. Should community health institutions be fully utilized, pressure will be shared between different levels of hospital. With lesser patients stacked in one healthcare institution, each patient child will be able to gain a greater amount of care during medical visits, and pediatricians will be able to have less pressure in their work, enabling them to better serve each individual patient.

The research has limitations on the diversity of healthcare institutions and the number of patients it surveyed due to authorization issues, while many characteristics of the

patient was not designed into the questionnaires to improve valid response rates. It hopes that similar studies will be performed with a large cross-sectional study which will bring more significant and applicable results. Moreover, further research may be performed on how different models of community healthcare influence patient preference in pediatric care, including models of assigning a family with a general practitioner or administration of community healthcare institutions directly performed by tertiary hospitals.

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