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Analysis on the willingness and influencing factors of choosing primary healthcare institutions among patients with chronic conditions in China: a cross-sectional study

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ABSTRACT

Objective To assess the willingness and factors influencing the choice of primary healthcare (PHC) institutions among patients with chronic conditions in China.

Design A nationwide population-based study with binary logistic regression was conducted and used to estimate the ORs of the influencing factors of health-seeking at PHC institutions using the Anderson model as a theoretical framework.

Setting The China Family Panel Studies (CFPS) database.

Participants The study sample included 7967 patients with chronic conditions identified from the 2016 and 2018 CFPS databases.

Results From 2016 to 2018, the rate of choosing PHC institutions for patients with chronic conditions dropped from 51.0% to 47.7%. The logistic regression results showed that patients with low family income (OR value of >60 000 group was 0.57, 95% CI 0.43 to 0.74), low education level (OR value of bachelor degree or above was 0.54, 95% CI 0.35 to 0.83;), older age (OR value of >65 group was 1.31, 95% CI 1.08 to 1.60;), hypertension and diabetes (OR 1.26, 95% CI 1.13 to 1.41), living in rural areas (OR value of urban was 0.47, 95% CI 0.38 to 0.60), immigrating from rural to urban areas (OR 1.64, 95% CI 1.26 to 2.13), reporting good health (OR value of very good was 1.33, 95% CI 1.05 to 1.68) and those from areas with a high proportion of PHC institutions (OR 1.05, 95% CI 1.02 to 1.07) were more inclined to choose PHC institutions. Conversely, patients with urban employee health insurance (OR 0.62, 95% CI 0.49 to 0.80) and more than one chronic disease (OR 0,83, 95% CI 0.75 to 0.92) preferred choosing a hospital.

Conclusions The patients' willingness to choose PHC institutions was low. The health-seeking preference of patients with chronic conditions is derived from medical needs and is influenced by the predisposing factors and tendencies of enabling resources. Measures should be taken to improve the capacity of PHC institutions.

Strengths and limitations of this study

- The data in this study were collected from a nationwide survey representative of patients with chronic diseases.
- Diabetes and hypertension were included as potential influencing factors in this study, which further distinguished it from similar studies.
- This study used a cross-sectional design, limiting its ability to identify the causal relationship between influencing factors and patient willingness.
- Our study ignored some important confounding factors such as the distance from home to primary medical institutions and social interactions, among others.

INTRODUCTION

Chronic diseases pose a serious threat to human health and have become a major public health problem worldwide, especially in low-income and middle-income countries.[1] According to data released by WHO in 2012, 87% of deaths in China are caused by chronic diseases.[2] As China's industrialisation, urbanisation and population ageing continue to accelerate, the burden of chronic diseases on the population is becoming increasingly high.[3] In this context, chronic disease management has become a key concern as it relates to access to appropriate, affordable and convenient health services.

Developed countries have consistently focused on primary healthcare (PHC) as the first defence against chronic conditions.[4] International experiences have shown that PHC institutions are the best choice for chronic disease management.[5] Like most countries in the world, China has also established a three-tier medical service system.[6] However, China does not have a gatekeeper system, thus residents can easily bypass PHC institutions and seek help from higher-level medical institutions. Most of the quality health resources in China are concentrated in hospitals, so residents generally lack trust

in the capacity of PHC institutions.[7] This has resulted in serious underutilisation of primary health services on the one hand, and excessive pressure on hospital services on the other, threatening the efficiency and effectiveness of China's healthcare system.[8] As chronic disease incidence increases and public health awareness improves, this situation will worsen if no measures are taken to direct the public to PHC institutions.

As part of China's healthcare reform, launched in 2009, PHC institutions have received major attention.[9] With a focus on strengthening the capacity of PHC institutions, the government increased its financial budget to them from ¥19 billion in 2008 to ¥140 billion in 2015.[10] However, despite substantial financial investment and infrastructure construction over the past decade, evidence suggests that the quality of PHC in China remains unsatisfactory.[11] Therefore, to divert patient flow to PHC institutions, the Chinese government implemented the Hierarchical Medical System (HMS) since 2015,[12] taking chronic diseases as the breakthrough point. Its specific measures include two-way referral, family doctor contract service, differentiated reimbursement of medical insurance for health institutions at different levels, and building an integrated medical service system.[13] HMS was fully rolled out around 2016.[12] In this study, chronic disease patients from 2016 and 2018 were taken as research subjects, one of the purposes of which was to examine the guidance effect of the HMS by comparing PHC institution selections in these 2 years.

Among chronic diseases, hypertension and diabetes are the top priorities for the HMS. The Chinese government has issued relevant documents to clarify the hierarchical diagnosis and treatment process of hypertension and diabetes,[14] making it clear that PHC institutions should be responsible for their preliminary clinical diagnosis and standardised management. The standardised management rate of hypertension and diabetes has also become an important indicator for the government to evaluate the performance of PHC institutions.[15] Compared with other patients, will those with diabetes and hypertension be more willing to choose PHC institutions? This is the research question of this study.

Although residents have low willingness to choose PHC institutions for their first visit,[16] empirical studies have shown that PHC institutions are fully capable of the diagnosis and treatment of common and frequently occurring diseases.[17] Research on the factors influencing residents' health-seeking preferences is emerging.[18–21] Existing studies tend to focus on special groups such as the elderly and migrant workers,[22 23] while few studies have focused on patients with chronic disease. Moreover, they have overlooked differences over time in health-seeking preferences, as well as their association with China's HMS policy. Therefore, the factors influencing health-seeking preferences for patients with chronic conditions require further exploration.

Based on the discussion above, this study seeks to assess the willingness and factors influencing the choice of PHC institutions among patients with chronic conditions in China, with the aim of providing recommendations for the further development of PHC institutions. Moreover, our findings may inform discussions in countries that do not yet have a gatekeeper system in place.

METHODS

Theoretical framework

Andersen's Behavioural Model, created by Andersen,[24] is a classic model for studying and analysing health service utilisation. It is widely used in health system evaluation and health service research.[25 26] According to Andersen, when individuals decide whether to use health services, they are influenced by three dimensions: predisposing, enabling, and need factors. Since its creation, the model has been modified and improved many times for specific applications[27]; however, these three classical dimensions remain constant. Based on them, this study also discusses the factors affecting health-seeking preferences for patients with chronic conditions in China.

Data source and sample selection

The data employed in this study were derived from the China Family Panel Studies (CFPS) for 2016 and 2018. The CFPS survey is funded by the Chinese government and conducted by the Institute of Social Science Survey of Peking University. CFPS is a nationally representative and biennially follow-up survey that collects the information at three levels: individuals, households and communities. The national baseline survey of CFPS was conducted in 2010, with a response rate of 81.25%. Moreover, CFPS sampled approximately 57 000 individuals from 15 000 households in 25 provinces of China by using a multistage probability-proportional-to-size sampling technique.[28] This study used data from 2016 and 2018, which are the latest two waves. A total of 36 892 adults were surveyed in 2016 and 37 354 were surveyed in 2018. At the end of the CFPS2018 survey, the cross-sectional response rate of individual samples was 67.4% and cross-wheel tracking rate was 80.8%. Compared with the UK household tracking survey, which was carried out at the same time, the response rate in the fifth round of CFPS2018 tracking is still at the international level.

Furthermore, the survey includes a combination of variables needed for our analysis, namely individual socioeconomic status (eg, education and family income), health insurance, health (eg, self-reported health and chronic disease), health service utilisation (eg, health seeking preference) and other demographic characteristics (eg, age, gender, residence).

The subjects of this study were patients with 'chronic diseases diagnosed by doctors in the past 6 months'. There were 5395 patients in 2016 and 5024 patients in 2018. After excluding samples with missing variables, there were 4903 in 2016 and 4765 in 2018. For those patients who participated in both 2016 and 2018, we only retained data from 2018. Finally, a total of 7967 patients

with chronic conditions were included in this study, including 3202 in 2016 and 4765 in 2018.

Variables and measures

Dependent variables

The dependent variable in this study was the willingness to choose PHC institutions, measured by the question, 'Where do you usually go to see a doctor when you are sick'? The specific reference to 'willingness to choose PHC institutions' in the answer included: (1) general hospitals, (2) specialist hospitals, (3) community or township health centres, (4) community health service stations, or village health offices and (5) clinics. According to national standards, CHCs/THCs, community health service stations and village clinics are defined as PHC institutions. Therefore, we set the dependent variable as a binary variable according to the level of the institution. In this study, the variable is given a value of 1 or 0 if the patient chooses a PHC institution or a general or specialist hospital, respectively.

To further explore patients' motivation in choosing PHC institutions, two outcome variables were included in this study: respondents' subjective evaluation of the service level and the medical condition of the selected institution. These two variables are derived from the following questions:

'How satisfied are you with the conditions at your chosen health care site?'

'What do you think is the level of care at your chosen site?' The answers were graded on a five-point scale from low to high.

Independent variables

Based on the classic Andersen model of medical service utilisation, this study explains the health-seeking preferences of patients with chronic conditions from three dimensions: predisposing characteristics, enabling resources and healthcare needs. The predisposing variables are age, gender, marital status, education and subjective views on the healthcare system. Enabling variables were medical insurance type, annual family income, location of residence and rural–urban migration status. Measures of need were self-reported health, diabetes/hypertension (a value equal to 1 if individuals had diabetes or hypertension), and more than one chronic disease. Additionally, we chose the proportion of PHC institutions in all medical institutions as the potential supply side factors of health-seeking preferences (figure 1).

As for the variable of medical insurance type, it should be noted that this study mainly focuses on the guiding role of social medical insurance in primary health services, including the New Rural Cooperative Medical Insurance (NCMS), Medical Insurance for Urban Employees (UEBMI) and Medical Insurance for Urban and Rural residents (URBMI). Respondents who participated in commercial medical insurance and public medical care were not included. Commercial health insurance in China is very rare, and public healthcare is gradually disappearing.

Data analysis

Descriptive statistics were used for patients with chronic diseases. The data from two waves of survey were merged, and a χ^2 test was used to identify the different selections of medical institutions among groups. Continuous variables were analysed using a one-way analysis of variance F-test. We performed a binary logistic regression model to investigate the OR (95% CI) of the influencing factors on patients' willingness to choose PHC institutions. The enabling variables (model 1–1), predisposing variables (model 1–2) and need variables (model 1–3) were controlled step by step to observe the effect of each factor explicitly. Separate models (model 2–1, model 2–2) were performed for each wave to capture the impact of changes in the influencing factors. Model 2-3 tested the differences between model 2–1 and model 2–2 by providing the interactions of 'year' and each of all independent variables. Furthermore, the rank-sum test was used to examine the differences in patients' subjective evaluations of the selected institutions.

Patient and public involvement

All data in this study were derived from the CFPS database, so no patients or members of the public were involved.

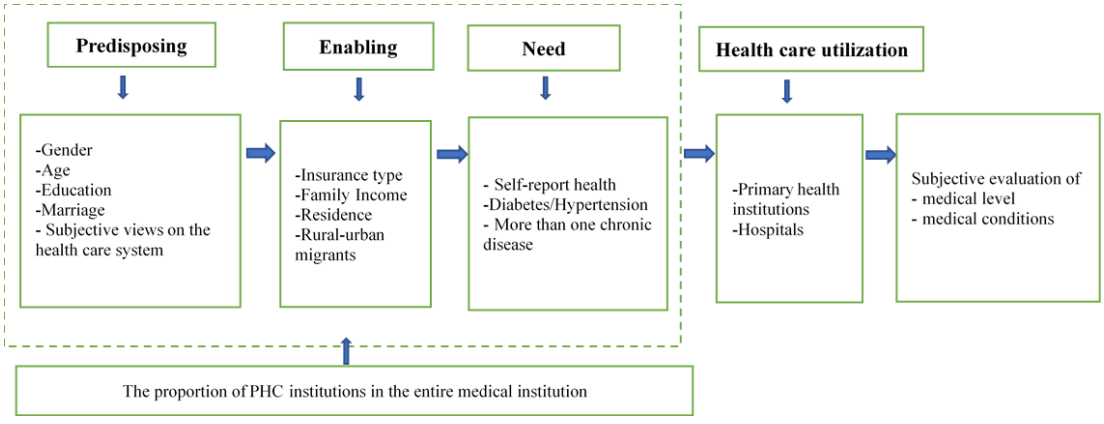

Figure 1 Andersen theoretical model of factors influencing health-seeking preferences in patients with chronic conditions. PHC, primary healthcare.

RESULTS

Descriptive analyses

As shown in table 1, a total of 7967 (56.0% female, 60.7% age 45–64 years) patients with chronic conditions were included in this study, including 3202 in 2016 and 4765 in 2018. In 2016, 51.0% of patients with chronic conditions chose PHC institutions, while the proportion dropped to 47.7% in 2018. Further analysis found that there was no significant decline in the proportion of patients with diabetes and hypertension who chose PHC institutions, while the proportion of other patients who chose PHC institutions declined sharply (see figure 2).

In total, the majority of chronic disease patients lived in rural areas (52.2%), were married (83.2%), had primary school education or below (59.6%) and were insured by the new rural cooperative medical system (68.7%). The annual net household income was ¥50 000–15 000 for 38% of patients. Of the patients, 43.1% considered their health status poor and 46.7% believed that China's medical problems were serious. Among the chronic patients, diabetes or hypertension accounted for 30.4%, and 41.0% of patients had more than one chronic disease. Additionally, 21.7% of the patients in this sample were rural–urban migrants. The mean proportion of primary medical institutions in all medical institutions was 93.61%. The difference of characteristics between the 2 years was shown in online supplemental table 1.

Univariate analyses

The univariate analysis in table 1 shows that compared with patients with chronic conditions in 2016, patients in 2018 were more likely to choose hospitals rather than PHC institutions, even though their proportion increased slightly in 2018.

From the perspective of predisposing factors, patients aged 44–64, with low educational levels, and who believed that China's medical problems were not serious were more willing to choose PHC institutions. Among the enabling factors, patients living in rural areas and those with low family income tended to choose PHC institutions. The proportion of NCMS insured patients choosing PHC institutions is much higher than that of patients without medical insurance or other insurance types. Rural to urban migrants are also more likely to choose PHC institutions. From the perspective of patients' health needs, patients with two or more chronic diseases were significantly more willing to choose hospitals.

Binary logistic regressions

The binary logistic regressions of health-seeking preferences are presented in table 2. Model 1-1 controlled enabling variables and showed that residence, income and rural–urban migration status were significantly correlated with health-seeking preferences. It is worth noting that NCMS was no longer significant in multivariate analysis. Model 1-2 examined the influencing factors on predisposing and enabling. It shows that for patients with chronic conditions, older and less educated patients are more likely to choose primary medical institutions.

Model 1-3 revealed that self-reported health status, suffering from diabetes or hypertension, having two or more diseases were significantly correlated with health-seeking preferences. Specifically, the odds of choosing PHC institutions for people who reported their health as average, good, and very good was 39% (OR 1.39; 95% CI 1.22 to 1.58; p<0.001), 38% (OR 1.38; 95% CI 1.23 to 1.56; p<0.001), and 33% (OR 1.33; 95% CI 1.05 to 1.68; p<0.05) higher than for those who reported their health as poor. Patients with two or more diseases were 17% (OR 0.83; 95% CI 0.75 to 0.92; p<0.001) less likely to choose PHC institutions than those with only one disease. For those suffering from diabetes or hypertension, the odds were 26% (OR 1.26; 95% CI 1.13 to 1.41; p<0.001) higher than those who did not. In addition, model 1-3 also indicated that patients living in urban areas (OR 0.47; 95% CI 0.38 to 0.60; p<0.001) were less likely to choose PHC institutions, despite rural–urban immigrants (OR 1.64; 95% CI 1.26 to 2.13; p<0.001) being more likely to choose PHC institutions. Being insured by UEBMI (OR 0.62; 95% CI 0.49 to 0.80; p<0.001) and having a high level of household income decreased the preference for primary medical institutions. Patients in 2016 and those from provinces with a higher proportion of PHC institutions were more inclined to choose PHC institutions.

As shown in table 3, logistic regression models (model 2–1 to model 2–2) were used to capture changes in the ORs of health-seeking preferences from 2016 to 2018. It is noteworthy that the impact of health needs became more pronounced over time. The significant effect of self-reported health has increased over the years. Furthermore, suffering from diabetes or hypertension was one of the main factors influencing patients' choice of PHC institutions in 2018, which was not significant in 2016. The effects of age and immigration status have also changed. Over time (model 2–3), immigration status had an important influence on health-seeking preferences, while the effect of age was no longer statistically significant.

The non-parametric test results in table 4 show that, compared with patients who chose PHC institutions, those who chose hospitals were more satisfied with the medical service. The medical services mentioned here include the condition of medical facilities and the level of medical technology.

DISCUSSION

Our results found that only 49% of patients chose PHC institutions, far lower than the goal of '≥70% proportion of residents with 2 weeks of illness who prefer PHC institutions.' proposed by the Chinese government in 2017.[13] PHC institutions make up nearly 94% of the total healthcare sector, yet they account for less than half of the workload and are underused. Therefore, guiding patients with chronic conditions to choose medical institutions reasonably and obtain high-quality medical services in an

Table 1 Univariate analysis of the differences of patients' willingness to choose PHC institutions

Variables	Total (n=7967)		Choosing PHC institutions (n=3905)		Choosing hospital (n=4062)		χ^2/F value	P value
	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD		
Year								
0=2016	3202	40.2	1632	51	1570	49	8.175	0.004
1=2018	4765	59.8	2273	47.7	2492	52.3		
The proportion of PHC institutions in the entire medical institutions (%)	93.61	2.09	93.88	1.92	93.35	2.22	127.955	<0.001
Predisposing								
Gender								
1=Male	3509	44	1695	48.3	1814	51.7	1.266	0.269
0=Female	4458	56	2210	49.6	2248	50.4		
Age								
1=16–44	809	10.1	318	39.3	491	60.7	34.323	<0.001
2=45–64	4833	60.7	2434	50.4	2399	49.6		
3=≥65	2325	29.2	1172	49.6	1153	50.4		
Subjective evaluation on the healthcare system								
0=No serious problems	3454	43.4	1797	52	1657	48	22.135	<0.001
1=Have serious problems	4513	56.6	2108	46.7	2405	53.3		
Education								
1=Primary school and below	4752	59.6	2659	56	2093	44	334.524	<0.001
2=Middle school	1891	23.7	843	44.6	1048	55.4		
3=High school	858	10.8	319	37.2	539	62.8		
4=Junior college	272	3.4	54	19.9	218	80.1		
5=Bachelor degree or above	194	2.4	30	15.5	164	84.5		
Marriage								
1=Married	6631	83.2	3249	49	3382	51	0.005	0.952
0=Unmarried	1336	16.8	656	49.1	680	49		
Enabling								
Rural/urban								
0=Rural	3807	47.8	2486	59.8	1674	40.2	402.199	<0.001
1=Urban	4160	52.2	1419	37.3	2388	62.7		
Rural–urban migrants								
1=Yes	1730	21.7	914	52.8	816	47.2	12.888	<0.001
0=No	6237	78.3	2991	48	3236	52		
Annual family income								
1=0–5000	1443	18.1	897	62.2	546	37.8	438.744	<0.001
2=5000–15 000	3025	38	1714	56.7	1311	43.3		
3=15 000–30 000	1922	24.1	829	43.1	1093	56.9		
4=30 000–60 000	1152	14.5	348	30.2	804	69.8		
5=>60 000	425	5.3	117	27.5	308	72.5		
Insurance type								
0=NO insurance	526	6.6	216	41.1	310	58.9	686.458	<0.001
1=URBMI	765	9.6	223	29.2	542	70.8		

Continued

Table 1 Continued

Variables	Total (n=7967)		Choosing PHC institutions (n=3905)		Choosing hospital (n=4062)		χ^2/F value	P value
	N/Mean	%/SD	N/Mean	%/SD	N/Mean	%/SD		
2=UEBMI	1205	15.1	264	21.9	941	78.1		
3=NCMS	5471	68.7	3202	58.5	2269	41.5		
Need								
Self-report health								
1=Poor	3431	43.1	1655	48.2	1776	51.8	4.83	0.305
2=Average	1573	19.7	786	50	787	50		
3=Good	2344	29.4	1142	48.7	1202	51.3		
4=Very good	368	4.6	185	50.3	183	49.7		
5=Excellent	251	3.2	137	54.6	114	45.4		
Diabetes/hypertension								
1=Yes	2425	30.4	1224	50.5	1201	49.5	2.972	0.088
0=No	5542	69.6	2681	48.4	2861	51.6		
More than one chronic disease								
1=Yes	3266	41	1508	46.2	1758	53.8	17.889	<0.001
0=No	4701	59	2397	51	2304	49		

NCMS, New Rural Cooperative Medical insurance; PHC, primary healthcare ; UEBMI, Medical Insurance for Urban Employees; URBMI, Medical insurance for Urban and Rural residents.

efficient and orderly way is a top priority for the prevention and control of chronic diseases and the reduction of medical costs.

Compared with 2016, the proportion of patients with chronic conditions choosing PHC institutions in 2018 showed a downward trend. China has fully implemented the HMS since 2015. With the implementation of the system, patients' willingness to choose PHC institutions has decreased rather than increased, which deserves great attention from relevant departments. From the perspective of demand side, the main reason lies in the difference in health insurance reimbursement, the core policy of HMS, whose guiding power is not sufficient.[29] In theory, to save costs, patients should choose PHC institutions first. However, our study indicates that the effects of NCMS and URBMI were not statistically significant, and patients with UEBMI were more likely to choose a hospital. A possible reason is that patients do not trust the service ability of PHC institutions and subjectively believe that they are not capable of solving their health problems, so they may still go to the hospital eventually. A reimbursement gap of 5%–10% is not sufficient to offset the opportunity cost. Furthermore, UEBMI is a type of social insurance, with the highest reimbursement rate, and patients naturally have the lowest sensitivity to cost.[30] This also explains why such patients were more willing to choose high level medical institutions. From the supply side, the root cause is the failure of quality health resources to flow from hospitals to the PHC institutions. Due to the lack of cooperation mechanism, hospitals in China see PHC institutions as a competitor, siphoning off patients and healthcare staff.[31] In recent years, the Chinese government has been vigorously promoting an integrated health service system to solve this problem.

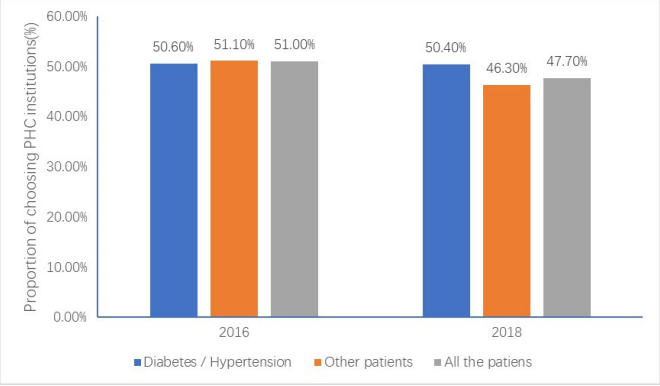

Figure 2 Health-seeking preference by survey wave for patients with diabetes and hypertension, other patients and all the patients.

Family income and residence were statistically significant in all models, indicating that they were the main factors affecting patient preferences for medical treatment. This study demonstrates that patients living in rural areas with low family income are more inclined to choose PHC institutions, which is consistent with the results of previous studies.[32 33] Compared with hospitals, PHC institutions cost less, thus patients with low family income can easily afford them.[34] Hospitals are much more easily accessible to urban than rural patients since

Table 2 Binary logistic regression analysis on the influencing factors of choosing PHC institutions for patients with chronic diseases (n=7967)

Variables	Model 1-1	Model 1–2	Model 1–3
Year			
2016 (Reference)			
2018	0.89 (0.81–0.98)*	0.89 (0.80–0.98)*	0.90 (0.81–0.99)*
The proportion of PHC institutions in the entire medical institutions	1.05 (1.02–1.07)***	1.05 (1.03–1.08)***	1.05 (1.02–1.07)***
Enabling			
Rural/urban			
Rural (reference)			
Urban	0.46 (0.37–0.59)***	0.47 (0.37–0.60)***	0.47 (0.38–0.60)***
Annual family income			
0–5000(Reference)			
5000–15 000	0.89 (0.78–1.01)	0.90 (0.79–1.03)	0.88 (0.77–1.00)
15000–30 000	0.71 (0.61–0.82)***	0.74 (0.64–0.86)***	0.69 (0.59–0.80)***
30000–60 000	0.58 (0.48–0.70)***	0.63 (0.52–0.76)***	0.57 (0.47–0.69)***
>60 000	0.54 (0.42–0.70)***	0.62 (0.47–0.81)***	0.57 (0.43–0.74)***
Insurance type			
NO insurance (Reference)			
URBMI	0.87 (0.67–1.11)	0.88 (0.68–1.13)	0.84 (0.65–1.08)
UEBMI	0.59 (0.46–0.74)***	0.65 (0.51–0.83)**	0.62 (0.49–0.80)***
NCMS	1.26 (0.99–1.59)	1.21 (0.96–1.54)	1.20 (0.95–1.53)
Rural–urban migrants			
No (Reference)			
Yes	1.69 (1.31–2.19)***	1.67 (1.29–2.16)***	1.64 (1.26–2.13)***
Predisposing			
Gender			
Female (reference)			
Male		1.03 (0.93–1.13)	0.99 (0.90–1.09)
Age			
16–44 (Reference)			
45–64		1.28 (1.08–1.52)**	1.34 (1.12–1.59)**
≥65		1.25 (1.04–1.51)*	1.31 (1.08–1.60)**
Education			
Primary school and below (reference)			
Middle school		0.87 (0.77–0.98)*	0.84 (0.74–0.95)**
High school		0.81 (0.68–0.96)*	0.78 (0.66–0.93)**
Junior college		0.50 (0.36–0.70)***	0.49 (0.35–0.69)***
Bachelor degree or above		0.55 (0.36–0.85)**	0.54 (0.35–0.83)**
Marriage			
Unmarried (reference)			
Married		0.91 (0.80–1.04)	0.90 (0.79–1.03)
Subjective evaluation on the healthcare system			
No serious problems (reference)			
Have serious problems		1.00 (0.91–1.10)	1.01 (0.92–1.11)
Need			
Self-report health			
Poor (reference)			
Average			1.39 (1.22–1.58)***

Continued

Table 2 Continued

Variables	Model 1-1	Model 1–2	Model 1–3
Good			1.38 (1.23–1.56)***
Very good			1.33 (1.05–1.68)*
Excellent			1.30 (0.99–1.71)
Diabetes/hypertension			
No (reference)			
Yes			1.26 (1.13–1.41)***
More than one chronic disease			
No (reference)			
Yes			0.83 (0.75–0.92)***

*P<0.05,**p<0.01,***p<0.001.
NCMS, New Rural Cooperative Medical insurance; PHC, primary healthcare; UEBMI, Medical Insurance for Urban Employees; URBMI, Medical insurance for Urban and Rural residents.

most hospitals are located in urban areas.[35] Furthermore, this study also considered the impact of rural–urban migration status on health-seeking preferences. Rural–urban migrants live in urban areas, but they participate in the NCMS. As the reimbursement ratio of different settlement areas is reduced, rural–urban migrants will bear a heavier economic burden to seek treatment, which could be a possible reason why they are more inclined to choose PHC institutions. Most migrate to the city to earn money and support their families. As a vulnerable group, they live on the 'edge' of the city, and thus their health needs and behaviours deserve further study and discussion.[23]

As mentioned, this study indicates that the differential reimbursement policy did not play a role in guiding patients to seek treatment in an orderly manner. However, previous studies concluded that residents who participated in NCMS were more willing to choose PHC institutions.[28] The above conclusions could indeed be drawn from the unifactorial analysis, but when individual characteristics, such as residence, age and education level, are considered, the influence of NCMS is no longer significant. One possible reason is that the individual characteristics of the insured group, rather than the type of insurance, affects medical preference. NCMS participants tend to live in rural areas and have lower levels of education and income, which were shown to be contributing factors in selecting primary medical care.

Health needs are important factors affecting patients' medical preferences, a fact reflected in this study where patients with poor self-reported health status and more than one chronic disease are more willing to choose hospitals than PHC institutions. The health status of these patients is poor, and primary health services may not be able to meet their medical service needs at the present stage.

It is worth noting that this study found that patients with diabetes and hypertension were more inclined to choose PHC institutions, which has not been observed in previous studies. Diabetes and hypertension are chronic diseases that the HMS paid great attention to, and local governments successively issued documents on the graded diagnosis and treatment of these two diseases between 2016 and 2017. Interestingly, the impact of diabetes or hypertension on health-seeking preferences was not significant in 2016 (model2-1), and its influence was only detected in 2018 (model2-2). This suggests that HMS policies for diabetes and hypertension may be effective. The Chinese government should continue to implement HMS and appropriately expand the scope of chronic diseases under priority management.

Predisposing factors affect the health-seeking preferences of patients with Non- communicalble diseases (NCD). Older people prefer PHC institutions, mainly because of their convenience. This convenience includes the simplicity and speed of their processing,[22] which also explains why people with less education are more willing to choose them.

Furthermore, this study also found that the proportion of PHC institutions is a promoting factor in the choice of PHC institutions. The Chinese government should further optimise the allocation of health resources, not only to maintain a high proportion of PHC institutions but to also make greater efforts to cultivate and introduce high quality health workforces.

Existing studies have found that residents with low income, low education, older age and living in rural areas are more willing to choose PHC institutions[19 20 23]; in other words, 'vulnerable groups' are those who prefer PHC institutions. Based on the fact that there is a gap between the quality of PHC services and hospitals,[36] we must ask further, do these people want to choose or have to choose PHC institutions? The answer depends on whether those who choose PHC institutions are satisfied with the service. This is because no rational actor[37] will choose a poor-quality service unless a high-quality service is inaccessible. As for those patients who chose PHC institutions, our results found that they were indeed less satisfied with the service level and conditions than patients who chose hospitals. This confirms to an extent our conjecture that patients likely tend to choose PHC

Table 3 Changes in the odds rations of health-seeking preference from 2016 to 2018

	Model 2-1 (n=3202)	Model 2–2 (n=4765)	Model 2–3 (n=7967)
Variables	**2016**	**2018**	**Year***
The proportion of PHC institutions in the entire medical institutions	1.06 (1.02–1.10)**	1.04 (1.01–1.08)*	1.00 (0.99–1.01)
Enabling			
Rural/urban			
Rural (Reference)			
Urban	0.44 (0.30–0.64)***	0.51 (0.38–0.69)***	0.49 (0.36–0.65)***
Annual family income			
0–5000 (reference)			
5000–15 000	0.75 (0.60–0.92)**	0.97 (0.81–1.15)	0.95 (0.80–1.13)
15 000–30 000	0.54 (0.42–0.69)***	0.80 (0.65–0.97)*	0.78 (0.64–0.95)*
30 000–60 000	0.43 (0.31–0.59)***	0.64 (0.51–0.82)***	0.61 (0.48–0.77)***
>60 000	0.50 (0.31–0.80)**	0.60 (0.43–0.83)**	0.56 (0.41–0.78)**
Insurance type			
NO insurance (reference)			
URBMI	0.87 (0.58–1.31)	0.81 (0.59–1.13)	0.78 (0.56–1.08)
UEBMI	0.57 (0.38–0.83)**	0.67 (0.48–0.92)*	0.66 (0.48–0.91)*
NCMS	1.25 (0.84–1.87)	1.16 (0.86–1.57)	1.14 (0.85–1.53)
Rural–urban migrants			
No (reference)			
Yes	1.40 (0.91–2.14)	1.80 (1.29–2.52)**	1.88 (1.34–2.62)***
Predisposing			
Gender			
Female (reference)			
Male	0.96 (0.82–1.12)	1.01 (0.89–1.14)	1.01 (0.89–1.14)
Age			
16–44 (reference)			
45–64	1.50 (1.15–1.97)**	1.19 (0.94–1.52)	1.17 (0.92–1.48)
≥65	1.59 (1.18–2.13)**	1.12 (0.86–1.46)	1.09 (0.84–1.42)
Education			
Primary school and below (reference)			
Middle school	0.71 (0.58–0.86)**	0.92 (0.79–1.08)	0.92 (0.79–1.08)
High school	0.80 (0.60–1.05)	0.77 (0.62–0.97)*	0.78 (0.62–0.97)*
Junior college	0.52 (0.30–0.91)*	0.47 (0.31–0.72)***	0.48 (0.31–0.73)**
Bachelor degree or above	0.62 (0.30–1.26)	0.48 (0.28–0.82)**	0.47 (0.27–0.82)**
Marriage			
Unmarried (Reference)			
Married	0.88 (0.71–1.09)	0.92 (0.78–1. 10)	0.90 (0.79–1.03)
Subjective evaluation on the healthcare system			
No serious problems (reference)			
Have serious problems	1.03 (0.88–1.20)	1.00 (0.89–1.14)	1.00 (0.88–1.14)
Need			
Self-report health			
Poor (reference)			
Average	1.29 (1.06–1.57)*	1.49 (1.25–1.79)***	1.49 (1.25–1.79)***

Continued

Table 3 Continued

Variables	Model 2-1 (n=3202) 2016	Model 2–2 (n=4765) 2018	Model 2–3 (n=7967) Year*
Good	1.38 (1.13–1.68)**	1.39 (1.20–1.62)***	1.40 (1.20–1.62)***
Very good	1.05 (0.73–1.50)	1.60 (1.17–2.18)**	1.57 (1.15–2.14)**
Excellent	1.41 (0.88–2.24)	1.29 (0.92–1.81)	1.30 (0.99–1.71)
Diabetes/hypertension			
No (reference)			
Yes	1.08 (0.90–1.29)	1.37 (1.20–1.57)***	1.37 (1.20–1.57)***
More than one chronic disease			
No (reference)			
Yes	0.79 (0.70–0.94)**	0.86 (0.75–0.98)*	0.86 (0.75–0.97)*

*P<0.05, **p<0.01, ***p<0.001.
NCMS, New Rural Cooperative Medical insurance; PHC, primary healthcare; UEBMI, Medical Insurance for Urban Employees; URBMI, Medical insurance for Urban and Rural residents.

institutions, despite their dissatisfaction with the service, because their resources and capabilities do not enable them access to a hospital, thus they must choose a PHC institution.

In conclusion, from the perspective of accessibility, affordability and convenience, PHC institutions should be the best choice for patients with chronic conditions. In reality, most patients still prefer hospitals. The main reason is that the service ability and level of PHC institutions have not been fully trusted by patients. With the rapid growth of the Internet in China, the convenience of visiting hospitals for patients has been greatly improved through appointment registration, etc. Furthermore, owing to China's rapid urbanisation, transportation is becoming increasingly accessible. Thus, the advantages of convenience and accessibility offered by PHC institutions will no longer be obvious, hence there is an urgent need to improve their capacity to attract patients.

Strengths and limitations

To the best of our knowledge, this is the first time nationwide data have been used to analyse the influencing factors of primary care for patients with chronic conditions in China. In this study, we selected data from 2016 and 2018 to observe the differences in patient preferences over time and attempted to determine whether policy measures such as the HMS played a role in guiding patients to seek treatment at the primary level. Additionally, diabetes and hypertension were included as potential influencing factors in this study, which further distinguished it from similar studies.

Table 4 Patients' subjective evaluation of selected institutions

Variables	Choosing PHC institutions (n=3965)	Choosing hospitals (n=4062)	Z	P value
Subjective evaluation of medical level			−11.549	<0.001
Terrible	81	50		
Poor	408	278		
General	1717	1474		
Good	1348	1713		
Very good	351	547		
Subjective evaluation of medical conditions			−4.932	<0.001
Very dissatisfied	50	60		
Dissatisfied	366	337		
General	1084	950		
Satisfied	2115	2339		
Very satisfied	290	376		

PHC, primary healthcare.

However, this study has some limitations. First, although 2 years of data were selected, the study used a cross-sectional design, limiting its ability to identify the causal relationship between influencing factors and patient willingness. Second, restricted by the content of the CFPS questionnaire, we ignored some important confounding factors such as the distance from home to primary medical institutions and social interactions, among others.

CONCLUSION

In China, the willingness of patients with chronic conditions to choose PHC institutions is low and has shown a decreasing trend year by year. Living in rural areas, low levels of education, low family income, rural–urban immigrants and the elderly are more likely to choose primary medical treatment. These results suggest that in many cases, patients may choose a PHC institution because they 'have to' not because they 'want to', with the real reason being that they cannot afford the service or are too far away from the hospital. Moreover, the differential reimbursement strategy in medical insurance did not guide patients to seek medical care in an orderly manner, as expected. This further shows that the various HMS strategies currently adopted in China have very little effect, and the service capacity and level of PHC institutions fail to meet patient needs.

Encouragingly, patients with diabetes and hypertension prefer PHC institutions, thanks to the HMS taking them as priority diseases, thus implementing standardised management. The Chinese government should continue to implement this policy and gradually expand its scope to other diseases.

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