ORIGINAL RESEARCH

Preference to Family Doctor Contracted Service of Patients with Chronic Disease in Urban China: A Discrete Choice Experiment

Haode Wang[1], Hui Sun[1,2], Chunlin Jin[1], Meifeng Wang[1], Yashuang Luo[1], Wenqian Song[3], Haiyin Wang[1]

[1]Shanghai Health Development Research Center, Shanghai Medical Information Center, Shanghai, People's Republic of China; [2]Key Laboratory of Health Technology Assessment, National Health Commission; School of Public Health, Fudan University, Shanghai, People's Republic of China; [3]Shanghai Overseas Rescue and Aid Service Center, Shanghai, People's Republic of China

Correspondence: Haiyin Wang, Shanghai Health Development Research Center, Minhang District, No. 181 Xinbei Road, Shanghai, 201199, People's Republic of China, Tel +86- 18917769216, Email why0522@126.com

Objective: Shanghai is one of the pioneers proposing family doctor contract service (FDCS). However, there is no quantitative research focusing on the Shanghai experience from a demand-side perspective. This study investigated Shanghai chronic patients' relative preferences for FDCS using a discrete choice experiment method.

Methods: A face-to-face discrete choice experiment (DCE) was performed to elicit the preference with 300 samples. Attributes and levels were extracted from the literature review and focus group consultation with patients. Seven attributes, follow-up frequency, medicine accessibility, family doctor competency, health management, referral convenience, appointment flexibility, and shared decision-making, were decided. Three levels were attached to each attribute. A mixed logit model was used to evaluate the multiple-choice data.

Results: A total of 248 patients completed the survey. Patient valued FDCS medicine accessibility ($\beta=0.57$, $P < 0.05$), and high family doctor competency ($\beta= 0.43$, $P < 0.05$), regular health management activities ($\beta=0.36$, $P < 0.05$), high follow-up frequency ($\beta=0.31$, $P < 0.05$) the most. The good doctor-patient shared decision-making atmosphere ($\beta=0.12$, $P < 0.05$), high referral convenience ($\beta=0.06$, $P < 0.05$) and high appointment flexibility ($\beta=0.04$, $P < 0.05$) are valued as less important. No significant preference heterogeneity was identified for patients with different sociodemographic characteristics. Respondents reported other FDCS needs, including online health consultation, specialist services in local institutes, higher reimbursement rates, free rehabilitation guidance for the disabled and personal health management.

Conclusion: This research is the first discrete choice experiment FDCS preference research targeting on Chinese urban population. The results suggested that to increase the quality of FDCS, policy-makers should prioritize follow-up frequency, medicine accessibility, family doctor competency and health management. The service package should consider a higher reimbursement rate and rehabilitation guidance for the disabled if extra health-care resources available. Future FDCS policy should consider stated societal preference and be congruent with it.

Keywords: primary care, family doctor contract services, urban resident preferences, discrete choice experiment

Introduction

Family doctor is the health "gatekeeper" of residents in the healthcare system and successfully manages most health problems.[1,2] Community residents seek primary care services from their family doctor and the affiliated primary health-care institute, which is fundamental to the hierarchical medical system in China.[3,4] While the definition of health-care professionals providing forefront primary care service varies among countries and provinces——for instance, the general practitioner (GP) in the UK National Health Service (NHS) system,[5] we defined the family doctor as the physician and public physician providing national public health service and contracted or uncontracted service under primary care-tertiary hospitals two-way referral mechanism.[6–8] The contract service is a voluntary bi-direction free health management supplementary service supported by the central government in China.[5,9,10] The service has been regarded as a critical

strategy to provide continuous primary care and improve health awareness of the vulnerable populations, such as senior citizens, pregnant women and patients with non-communicate chronic diseases.[11]

Many empirical studies have reported the positive feedback on contract service with cross-sectional data, especially for chronic disease patients.[4,10,12–14] Compared with other types of regular primary care and regular primary care doctors, family doctor contract service (FDCS) improved the health outcome of community residents, and households reported to receive follow-up on treatments more efficiently.[14] It was also proved to be a cost-effective intervention for chronic disease patients. A prospective survey indicated that all contracted patients (80.79%) implemented family doctors were important for non-communicable disease management.[15] As China's healthcare security system is facing heavy financial barriers caused by the rapidly surging chronic disease morbidity rate,[16,17] FDCS can provide a less costly alternative.

Shanghai launched the FDCS program in 2011, and over eight million citizens have been covered for now.[18] The Shanghai Health Commission issued notice on further implementation of contract services for family doctors in 2017 to increase the coverage of this service.[19] Between 2011 and 2021, the percentage of chronic disease patients (hypertension and diabetic patients) coverage increased from around 50% to 84%.[20] However, the ratio of using FDCS service out of the total number of signed residents remained low.[3,20] A cross-sectional survey in Changning district, Shanghai, indicated that the contracted service outperformed typical family doctors in the perspective of visiting behavior, but the rate was still lower than 30%.[21] Yao et al reviewed the remaining barriers to the FDCS service that may result in a lower utilization rate,[22] and from a supply-side perspective, one-third of all studies mentioned low participation willingness.[23] The knowledge of the patients' preferences could assist the policy-makers, and local health service providers, in optimizing the FDCS service to be more responsive to patient demand. The DCE method was increasingly used to elicit preference to address health policy-making and healthcare resource allocation concerns.[24] For instance, it was used to determine the value of aspects of rheumatoid arthritis intervention[25] and measure the relative preference for family doctor service in rural China.[5] Unfortunately, no preference research focuses on the urban chronic patient cohort published.

This study intends to remedy this research gap by evaluating the stated preference of non-communicable chronic disease patients in Shanghai. Unlike retrospective studies eliciting revealed preference from behaviors, this prospective study would elicit stated preference from statements indicating a quantitative relationship between aspects of FDCS service.[26] While the survey-based technique describes what patients expect to happen in the future, hypothetical states are presented as alternative options.

The discrete choice experiment (DCE) is a frequently used technique to elicit preference by comparing two or more alternative scenarios. The method is based on Lancaster's theory, in which the consumer utility is determined by the characteristics (attributes) and specifications (attributes levels) of each consumed objective.[27] The individual's choice of paired or triplet scenarios indicated their preference on each attribute and level, assuming that the respondent considers all the information simultaneously. Another DCE theoretical foundation is the random utility theory (RUT), in which the individual behaves in a probabilistic way: the utility function consists of the explicit (systematic part) and the implicit (random part).[28] This study seeks to explore the patient preference for each identified factor by using the DCE method. The study results would provide evidence for optimizing the contracted services and adjusting service packages specially designed for non-communicable chronic disease patients in Shanghai.

Methods
Generate Attributes and Levels
Systematic literature reviews informed the attribute and level selection of the published literature and qualitative works. A recently published literature review in the English language and a meta-analysis identified attributes highly related to this study.[23,29] However, there was no published systematic review that considered preference articles published in the Chinese language. The literature review conducted by the research team synthesized the attribute and levels of information regarding the family doctor preference research in Chinese languages and updated the English review. The attribute information from the literature review shared the equal weight and merged if attributes overlapped.

Phase I and II were focus group consultations with general public samples (n = 20) and eight interviews with other stakeholders, including city or district Health Commission members, health-care professionals and independent think

tank researchers. Each focus group consultation was organized in the Songjiang district with four chronic patients who signed the FDCS contract and two primary care patients. They were encouraged to share their opinions on:

1. how did they use the FDCS or family doctor service,
2. the factors that may influence them in selecting a family doctor or signing the FDCS,
3. satisfaction with the local family doctor service, and
4. other recommendations for this policy.

Following the semi-structured questions, they would be presented with 10 attributes elicited from the literature reviews,[23] with a detailed explanation on each attribute. The respondents ranked the attributes from the most important to the least relevant. All the data were analyzed with thematic method.

Eight interviews with stakeholders reviewed the focus group outcome and decreased the attribute from 10 to 7: follow-up frequency, medicine accessibility, family doctor competency, health management, referral convenience, appointment flexibility, and shared decision-making. Levels were assigned to each of the seven attributes according to stakeholder suggestions and review evidence. Each attribute had three levels to reflect the key characteristics. Each attribute's descriptions are as follows, and Figure 1 provides the details.

1. Follow-up frequency: the follow-up frequency indicated the average number of visits of family doctors for their contracted chronic disease patients. The local health-care professionals specified the levels: 4 times per month as high frequency, 2 times per month as medium frequency and one time per month as merely meeting the requirement.
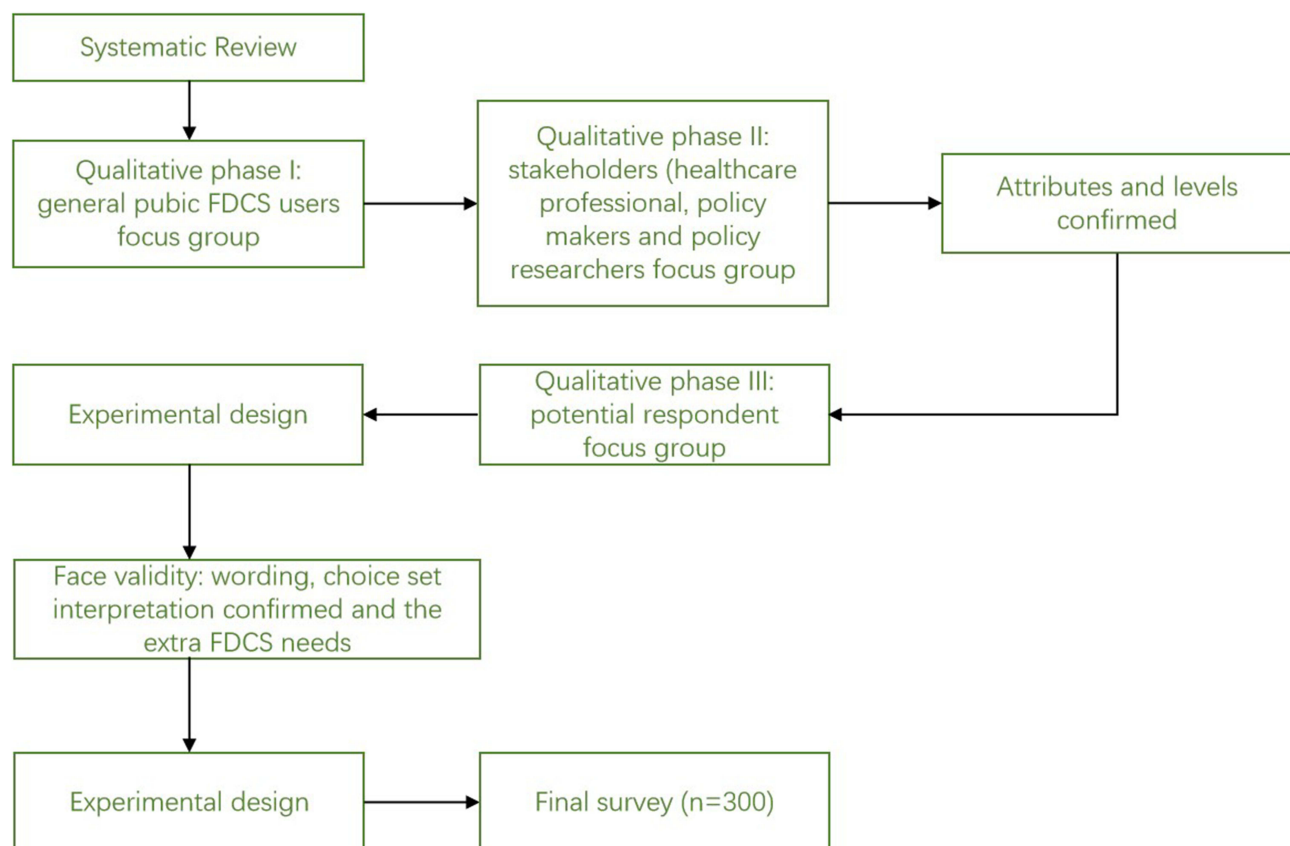

Figure 1 Development of the DCE survey.
Note: The literature review is conducted with Chinese and English key words separately.

2. Medicine accessibility: Pharmaceutical service was a critical part of FDCS service, which referred to the availability of necessary chronic disease medicine or the difficulty with getting the required prescription. The attribute reflected the extent of fundamental pharmaceutical needs was satisfied. A three-level specification, fully satisfied, satisfied and not satisfied at all, was assigned.

3. Family doctor competency: the family doctor competency indicated physicians' skills and professional title, which was closely related to patient confidence with FDCS.[15] A family doctor with high credentials and a well-renowned professional title will boost the willingness for service use. The attribute levels are: low, medium and high.4) Referral convenience: this attribute measured the satisfaction of the need for utilizing referrals to specialists. The attribute levels are: low, medium and high.

1. Health management: the health management service was intended to deal with multiple challenges: polypharmacy, multiple chronic disease conditions, mental health problems, harmful lifestyle and compulsory informal care. Models for the FDCS health management were not well established in Shanghai. However, the normal activities included frequent checkups, health recording and health promotion. There are three frequency levels for this attribute: 6 times per month (regular), four times per month (medium), and one time per month (seldom).

2. Appointment flexibility: Hole (2008) defined appointment flexibility as the choice of appointment times offered.[30] The increase in appointment flexibility would lower the opportunity cost for patients with an increasing health budget. The levels are high (lots of alternative appointment times), medium (some alternative appointment times), and low (assigned appointment time).

3. Shared decision-making: this attribute was frequently used, and it could be defined as the doctor involved patients in decisions about chronic disease treatments and pharmacist prescriptions. The assigned levels were well involved, appeared to be involved and were not involved (Table 1).

Phase III validated each item's wording and tested the public understanding of the multiple-choice tasks using face-to-face interviews. The consultation with five patients provided supplementary information for further refinement of the description of each attribute. Although the level for some attributes was abstract and published articles expressed the same meaning with controversial expressions, respondents interpreted the levels correctly.

Study Design

The experimental design and choice data analysis were simultaneously considered, with a consideration to identify functional forms of interest while minimizing the number of choice sets and avoiding any implausible scenarios. A fractional factor analysis method decreases the 2187 (3^7) hypothetical scenarios to a reasonable number. An efficient main effect design was applied, and the design was conducted with the software Ngene. The efficient design followed recommended health economics DCE best practice guidelines considering the two-way interactions between attributes.[31,32] Although the utility-neutral optimal design was not competitive with Bayesian optimal designs,[33] it was proved that fixed prior value performed as well as probabilistic priors and may generate a more efficient design if the attribute value distribution remained unknown. All comparisons containing a dominant scenario, ie, a hypothetical scenario with all attributes better than the comparator, were excluded. All of the attributes were effects coded.[34] Eighteen choice sets were generated, and a pre-test (with ten respondents) was conducted to confirm the understandability and validity (Table 2).

Data Collection

The DCE survey was conducted through a face-to-face interview in Shanghai with chronic disease patient samples from Songjiang district, Huangpu district and Pudong district. Random sampling was employed to choose samples from the local FDCS patient list. This research employed empirical evidence and theoretical formula to calculate the sample size.[5,35] Enumerators surveyed 300 samples in 2019. One reminder, together with the consent, was presented before the formal data collection to ensure each respondent clearly understood the research target and data protection policy. Then, two warm-up paired comparison questions were introduced first to check if the respondents had the cognitive ability to complete the DCE task. The formal questionnaire contained 18 choice tasks plus a set of socio-demographic questions.

Table 1 Discrete Choice Attribute, Explanation and Levels

Attributes	Explanation	Levels
Follow-up frequency	Average monthly disease-related follow-up of family doctors	High frequency, at least 4 times per month Medium frequency, 2 to 4 times per month Low frequency, 1 or less time per month
Medicine accessibility	Availability of necessary chronic disease medicine/prescriptions	Fully satisfied Satisfied Not satisfied
Family doctor competency	The professional skills and title of physicians	High Medium Low
Health management	The frequency of regular health management activities including healthcare propaganda	High frequency, at least 6 times per month Medium frequency, around 4 times per month Low frequency, 1 or less time per month
Referral convenience	The satisfaction of referral between GPs and hospitals	High Medium Low
Appointment flexibility	The choice and flexibility of appointment times offered	High, lots of alternative appointment times Medium, some alternative appointment times Low, assigned appointment time
Shared decision making	The doctors are willing to involve patients in decisions about treatments and discuss with patients.	Well involved Appears to involved Not involved

Table 2 An Example of a DCE Question. Imagine There are Two Alternative Contract Plans for You to Select, Please Choose the One You Prefer

Attributes	Contract Plan 1	Contract Plan 2
Follow-up frequency	High frequency	Medium frequency
Medicine accessibility	Satisfied	Fully satisfied
Family doctor competency	High	Medium
Health management	High frequency	Low frequency
Referral convenience	Medium	High
Appointment flexibility	Some alternative appointment times	Assigned appointment time
Shared decision making	Well involved	Not involved
Which contract plan would you choose?	□	□

Note: The sample question is a translation of the Chinese version.

The enumerator and the researcher double-checked all questionnaires. Any questionnaire with a respondent time less than 30 minutes, over one-third of all the questions skipped, selected the same answer (eg, select A for all the paired comparisons), and selected randomly without judgement would be dropped. Enumerators would pay members in vouchers (50 Yuan) for their contribution.

Data Analysis

The analysis of ordinal data is based on choice-based statistical models to generate relative coefficients of attribute levels, and the relative significance can be interpreted as a relative preference for each attribute level.[32] U_{ij} represents the latent utility value, which is a linear additive function of the attribute levels (X_{ij}) and the error term$_i$.

$$U_{ij} = \alpha_i + \beta_1 X_{ij} + \varepsilon_{ij}$$

In the health sector, reviews found that ordinal data (especially discrete choice data) were commonly analyzed by Multinomial Logit (MNL) models and mixed logit models.[36,37] MNL model is a homogeneous model assuming independence of irrelevant alternatives (IIA), and error terms are independent and identically distributed.[38] The mixed logit model relaxed the homogeneity assumption by allowing the parameter to be random with imposed distributions.[38] This research employed the heterogeneity model as the respondents had various chronic disease types and socio-demographic characteristics. All attributes were coded as dummy variables. The coefficients of each attribute level indicated the utility level of each variable. Because FDCS was a free service, there was no willingness to pay information, and the relative importance implies no monetary preference. All analyses were performed in Stata statistical software (version 14 SE, Stata Corp).

Results

Study Participants

A total of 248 participants completed the survey questionnaire after excluding 52 participants who failed to satisfy the criteria. The sample characteristics are reported in Table 3. Among the quantified respondents, approximately 42% (n = 105) were male, with a mean age of 58.3. The majority of them received high school or above education (77%, n = 166), and the self-reported monthly household income ranged from less than 3000 (n = 27) to over 10,000 (n = 10) RMB. The reported chronic diseases numbers were: hypertension (n = 213), coronary disease (n = 82), apoplexy (n = 50), diabetes (n = 139) and hyperlipemia (n = 149). Over half of all FDCS served patients had two or more chronic diseases.

Model Estimation

The concept of relative preference intensity was used for comparing the degree of attribute preference. Fraquehar (1989) introduced the concept and noted that it simplified the utility analysis in decision problems.[39,40] Results are illustrated in Figure 2, with 10 representing the most preferred attributes and 0 representing the least preferred. The vertical bars around each level mean estimate denoted the 95% confidence interval about the point estimation. The DCE with chronic patients

Table 3 Demographic Characteristics of Samples

Characteristics	Number/Percentage (%)		Characteristics	Number/Percentage (%)	
Gender			**Chronic disease**		
Male	105	42%	Hypertension	213	86%
Female	143	58%	Diabetes	139	56%
			Hyperlipemia	149	60%
Age (years)	58.3±14.2		Coronary disease	82	33%
			Apoplexy	50	20%
Marital status			Other	32	13%
Married	210	85%	**Household income per month (CNY*)**		
Single	15	6%	<5000	201	81%
Divorce	6	2%	5000–10,000	37	15%
Widow	17	7%	>10,000	10	4%
Education level			**Health insurance Type**		
Junior middle or below	82	33%	Employee insurance	179	72%
Senior high school/technical secondary school	104	42%	Resident insurance	60	24%
Junior college	40	16%	Others	10	4%
Bachelor or above	22	9%			

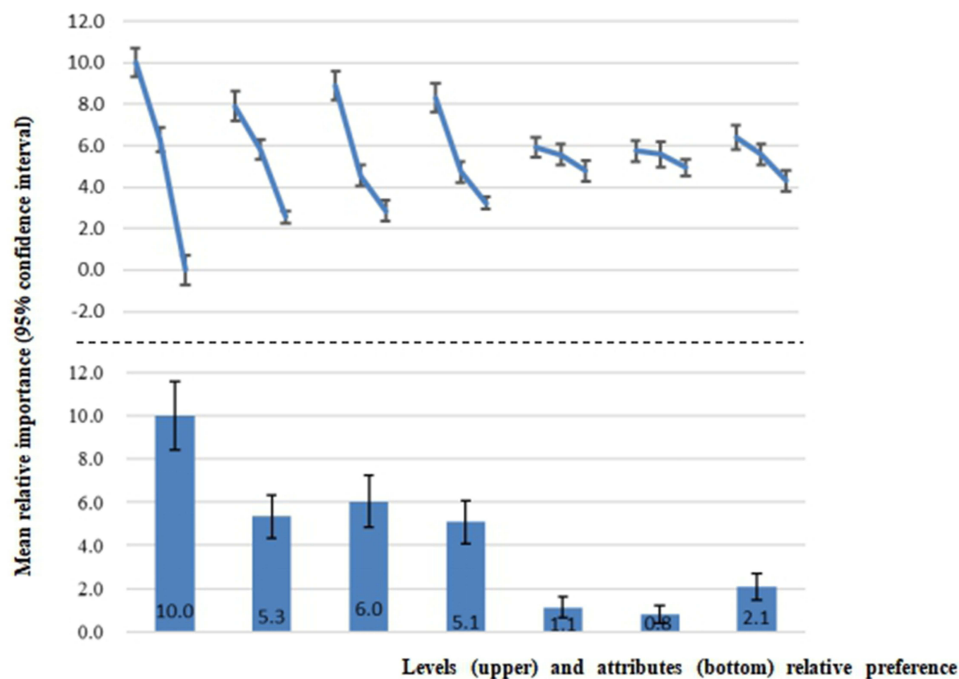**Note**: *The average exchange rate between US$ and CNY in 2020 was US$1 = CNY6.71.

Figure 2 Relative preference intensity of each attribute.
Notes: From left to right: medicine accessibility, follow-up frequency, family doctor competency, health management, referral convenience, appointment flexibility, shared decision-making. Upper figure showed the relative preference of each level and the bottom figure showed the relative preference of the attribute in general.

revealed that the preferences intensity for follow-up frequency (5.3± 1.3), medicine accessibility (10.0 ± 2.0), family doctor competency (6.0 ± 1.1), health management (5.1± 0.9) were above 5, which indicated a relatively high preference. The preferences intensity for referral convenience, appointment flexibility, and shared decision-making was lower than 2.5.

The main effects of mixed logit model results are displayed in Table 4. All attribute levels had significant coefficients (indicating the attribute levels significantly influenced the decision-making process). The result had an expected sign (a worse level had a relatively minor coefficient), indicating the results were logically consistent.

Within the scenarios, the highest level of medicine accessibility (coefficient, 0.57 [Standard error (SE), 0.05]), followed by family doctor competency (coefficient, 0.43 [Standard error (SE), 0.03]) and health management (coefficient, 0.36 [Standard error (SE), 0.04]), were the main drivers of respondent choice. Replicating the scenarios but varying follow-up frequency, health management and appointment flexibility weights increased greater than level change: although the times are doubled for each upper level (eg, the follow-up frequency changed from 1 time to 2 times, and from 2 times to 4 times respectively), the increment in weights from the lowest level to medium level was much larger than the increments from medium level to the highest level. The most significant marginal increase was from fully satisfied medicine accessibility to satisfied medicine accessibility—all of the results consistent with the economic diminishing marginal utility theory.

The standard deviation (SD) results suggested no significant preference heterogeneity existed among the Shanghai chronic disease patients. Preference heterogeneity existed if the confidence intervals (CI) crossed 0. However, the result did show that the CI of attributes referral convenience (medium level) and appointment flexibility (medium level) contained 0. Preference heterogeneity risk still exists, and methodology research proved mixed logit model provided more convincing under this circumstance.[38]

Discussion

The Chinese government has fundamentally changed the family doctor and regarded family doctor as a solution to provide rudimentary and accessible primary care in low-resourcing settings in recent years.[2,41] Compared with family doctors in other western countries, a family doctor in China was not an independent general practitioner. On the contrary,

Table 4 Main Effects Model Estimation Logit Model Results

Attributes and Levels	Coefficient	S.E.	value
Medicine accessibility			
Fully satisfied	0.57	0.05	<0.01
Satisfied	0.11	0.03	<0.01
Not satisfied	−0.68	0.05	<0.01
Follow-up frequency			
High frequency, at least 4 times per month	0.31	0.04	0.01
Medium frequency, 2 to 4 times per month	0.05	0.02	<0.01
Low frequency, 1 or less time per month	−0.36	0.04	<0.01
Family doctor competency			
High	0.43	0.03	0.02
Medium	−0.11	0.03	<0.01
Low	−0.32	0.04	<0.01
Health management			
High frequency, at least 6 times per month	0.36	0.04	<0.01
Medium frequency, around 4 times per month	−0.09	0.02	0.01
Low frequency, 1 or less time per month	−0.27	0.03	<0.01
Referral convenience			
High	0.06	0.02	0.03
Medium	0.02	0.02	0.01
Low	−0.08	0.03	<0.01
Appointment flexibility			
High, lots of alternative appointment times	0.04	0.02	<0.01
Medium, some alternative appointment times	0.02	0.02	0.02
Low, assigned appointment time	−0.06	0.03	<0.01
Shared decision making			
Well involved	0.12	0.03	0.03
Appears to involved	0.02	0.02	<0.01
Not involved	−0.14	0.03	<0.01

Notes: [a]Coefficients represent the change in utility for a respondent for a specific level of given attribute, where a larger coefficient indicates a higher preference attitude. [b]P value <0.05 indicates a significant result.
Abbreviation: SE, standard error.

the national healthcare commission (NHC) introduced the primary target of the family doctor was providing public health services and health management consultations for vulnerable groups, including senior citizens, young children, pregnant women, disabled people and chronic disease patients.[18] To strengthen the link between family doctors and patients, NHC proposed a new five-year plan on establishing a contracted family doctor service system around the country in 2016 and targeted full coverage in 2020.[42] The reformation emphasized that FDCS referred patients had higher reimbursement rates in hospitals. However, with the ageing population and prevalence of chronic disease, the FDCS system should be as strong as the patients and government expected. Shanghai was the first city to raise and implement the FDCS primary care reformation to promote the efficiency of scarce health resource allocation and enhance the family doctor's "health gatekeeper" role. To further optimise the policy and achieve the full-coverage goal, studying incentives that appeal to residents to sign with the family doctors would be significant.[9,21]

This DCE research, targeting urban chronic disease patients, provided quantitative insight into family doctor preference. This study relied on data from a discrete choice experiment survey with chronic patients from Shanghai to investigate the patient preference for the FDCS. A comprehensive literature review on Chinese and English family doctor preference research was conducted to identify the potential attributes, and the result was presented to help focus group consultees and interviewed stakeholders on deciding DCE attributes and levels. A fractional factorial design method was

applied, and a DCE survey was conducted in Songjiang, Shanghai. Building on the multiple-choice data of which the respondents lived in an urban area, the analysis reflected the general preference of urban chronic patients.

Some findings stemmed from the analysis: firstly, patients highly valued medicine accessibility, family doctor competency, health management and follow-up frequency. This finding was consistent with the role of family doctors and primary care in Shanghai, where pharmaceutical service was the most important need for patients with a chronic condition, requiring long-term medication. However, the family doctor prescription should in-line with the national essential drugs list.[43] This regulation prevented a large proportion of mobility-impaired patients and financially less well-off patients from accessing high-quality medicine conveniently and inexpensively.[44] From the perspective of doctor competency, a published preference study targeting rural FDCS users, where experienced health-care provider was limited, indicated a high preference for the quality of family doctor.[5,15] This study finding suggested that even for the urban area, lacking qualified family doctors was still one of the top concerns of FDCS users. The conclusion was supported by a multi-center survey where the respondents regarded the levels of skills as the main reason that they refused to visit primary care institutions.[6] The comprehensive and considerable health management service was one of the well-renowned characteristics of Shanghai family doctor service since 1994,[45] when Shanghai tertiary hospitals launched the "serve patients in their community" campaign.[18] Shanghai Healthcare Commission required all the family doctors to plan health management and face-to-face follow-up with the vulnerable contracted residents every month. After 10 years of effort, the high preference for health management and follow-up frequency indicated that participants gradually realized the advantages of community health management. Besides, real-world evidence also proved the achievements.[4,14] A retrospective effect analysis proved that management of the hypertension cohort increased the blood pressure control rate by 15.6%.[46]

Second, we found that the patients valued less on referral convenience, appointment flexibility and shared decision-making. Referral convenience and appointment flexibility were results of the density of primary care institutes and hospitals. Zhang et al analyzed the China Health and Retirement Longitudinal Survey (CHARLS) data-set to investigate the preference factors of the aged population and discovered density of hospitals was significantly associated with lower primary care use.[3] We found heterogeneous preference with chronic disease patients that density of hospitals was an insignificant factor. The first reason could be that for chronic disease patients, although secondary and tertiary hospitals commanded well-trained doctor resources, the need for high drug availability was superior to institution density. Another reason was that Shanghai had the richest medical resources in China and the resources[47] constraints might be less considered. The patient-centered care preference attribute, shared decision-making, achieved a similar result as UK primary care discrete choice research,[48] where patients were less preferred this factor. However, we suspected that respondents might not fully understand the importance of shared decision-making and heuristically interpreted it as a family doctor's attitude, where the "share" factor had been neglected.

Thirdly, apart from the attributes, participants reported other FDCS requirements, including online health consultation, specialist services in local institutes, higher reimbursement rates, free rehabilitation guidance for the disabled and personal health management. We suggested that policy-makers consider the extended health service with the DCE modelling results. For instance, the online health consultation and specialist services in local institutes reflected concerns with referral mechanism and could be achieved in a low-resource setting if a medical alliance among primary care institutes and the local secondary hospital could be established. Higher reimbursement rates and rehabilitation guidance requirements for the disabled indicated that poor residents still had a financial burden for using the FDCS service. Higher reimbursement rates for necessary chronic disease medicine and free fundamental rehabilitation therapy would break the pro-rich inequity.

Limitations

Although the research processes were well-designed, there were still several limitations: given the nature of the survey participants, the research result might have low external validity for patients living in other cities in China. Although Shanghai has over 30 million residents and the sample size was representative enough, it was notable that the GDP per capita in Shanghai was significantly higher than in other provinces.[49] Another limitation was the participant's understanding of attribute and DCE tasks. Although the qualitative consultations confirmed the validity of our study design, the majority of our

respondents were senior residents and they may have lower cognitive ability to consider all the information together. Future research with analysis of patients living in other cities could give further insight into patient preferences.

Conclusion

This innovative study examined the relative preference of non-communicative chronic disease patients for FDCS. The modelling result indicated that medicine accessibility, family doctor competency, health management and follow-up frequency were the top factors determining patient preference, while referral convenience, appointment flexibility and shared decision-making were less important. Recently, a more evidence-based approach to allocating public health resources has been recommended.[50] Policy-makers should provide the right incentives for chronic patients and allocate extra health resources as the patients expect. This research provided quantitative evidence to assist FDCS policy making. This research recommends conducting further DCE preference research with samples from other provinces to get a more comprehensive perspective on FDCS preference, t.

Ethics Approval and Consent to Participate

The Ethical Committee of the Shanghai Health Development and Research Center approved the study protocol. The writer and research team confirm that this research caused no harm (physical or mental) to any participants. The research process complies with the Declaration of Helsinki. The investigation was conducted after written informed consent was obtained from all participants.

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Disclosure

The authors declare no conflict of interest.

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