Chinese General Practice Journal 2 (2025) 100060

Contents lists available at ScienceDirect

Chinese General Practice Journal

journal homepage: https://www.keaipublishing.com/en/journals/chinese-general-practice-journal/

Research article

Demands and satisfaction for family doctor contracted services in Tianjin City: A survey based on Kano model

Wei Tingting[a], Zhang Zhibo[b], Li Ruolan[c], Liu Pei[c], Liu Ying[c], Pan Liping[c], Jia Jie[c], Zhang Na[d], Bian Bo[c,*]

[a] Department of Cardiology, Tianjin Medical University General Hospital, Tianjin, China
[b] Department of General Practice, Yangliuqing Town Community Health Service Center, Tianjin, China
[c] Department of General Practice, Tianjin Medical University General Hospital, Tianjin, China
[d] Department of General Practice, Wah Yuen Street Community Health Service Centre, Tianjin, China

ARTICLE INFO

Keywords:
Family doctor
Family doctor contracted service
Residents' demands
Tianjin
Kano model

ABSTRACT

Background: Family doctor contracted services have been widely implemented across China, yet challenges remain in improving coverage and service quality.

Objective: This study analyzes the demands for family doctor contracted services across different age groups and contracting status in Tianjin communities, using the Kano model, and evaluates satisfaction among residents who have signed with family doctors.

Methods: A cluster stratified sampling method was employed to distribute questionnaires to residents in six communities across ten districts of Tianjin City from October 2023 to January 2024. Data were collected via face-to-face interview and interviewers assisted completing questionnaire for the participants. The Kano model was used to analyze service demands, and satisfaction was also assessed.

Results: A total of 600 questionnaires were completed. Kano model analysis classified service attributes as follows: Must-be Attributes (community health education, common disease diagnosis and treatment, additional 5 % outpatient reimbursement, long-term prescriptions), One-dimensional Attributes (referral services, comprehensive health assessments), Attractive Attributes (medication assessment, personalized annual health plans, home bed service, home visits, family lifestyle counseling), and Indifferent Attributes (health knowledge and skill training, electronic health records). Significant variations in demands were observed by age and contracting status. The top satisfaction scores for participants who have signed with family doctors were: additional 5 % outpatient reimbursement (4.09 ± 1.14), long-term prescriptions (4.03 ± 1.14), electronic health records (3.55 ± 1.20), common disease diagnosis and treatment (3.29 ± 1.40), and community health education (3.27 ± 1.20). The lowest scores were for health knowledge and skill training (3.14 ± 1.24), medication assessment (3.12 ± 1.26), referral services (3.11 ± 1.02), home bed service (2.97 ± 1.30), and home visits (2.94 ± 1.21).

Conclusion: The study identifies key service attributes that influence satisfaction and highlights significant variations in demands across age and enrollment groups.

Family doctor contracted services are a core component of the primary care system in China and are expected to play a crucial role in shaping the tiered healthcare system.[1] Provided by general practitioners(GPs), the service packages are delivered through contracts, providing continuous and comprehensive medical care and health management to target population. The aim is to enhance health outcomes, optimize resource use, and reduce medical costs.[2,3] In 2016, with approval of the State Council, Health Reform Office and other departments of the central Government issued the "Guidelines of Promoting Family Doctor Contracted Services".[4]

Pilot programs of family doctor contracted service were launched in 200 pilot cities of China as a component of public hospital reform. At the same year, pilots were introduced in the Heping, Hebei, and Beichen Districts of Tianjin City, covering 29 community health centres. By the June 2017, 330,000 individuals had signed contracts, marking a shift towards increased utilization of primary care services. The program then was expanded across the City.[5,6] By the September 2022, over 2400 family doctor service teams formed in the City, and achieved nearly 4 million contracts.[7] To regulate and promote the high quality of the services, the Tianjin People's Congress Standing Committee is-

Peer review under the responsibility of Editorial Office of Chinese General Practice Journal.
* Corresponding author.
E-mail address: bianbozyy@163.com (B. Bo).

https://doi.org/10.1016/j.cgpj.2025.100060
Received 10 April 2025; Received in revised form 14 April 2025; Accepted 23 April 2025
Available online 12 June 2025

Table 1
Items of family doctor contracted services in Tianjin.

Service Category	Service Item	Service Content
Primary Care	Common Disease Diagnosis and Treatment	Establish appointment-based outpatient services to provide common disease diagnosis and treatment, frequently occurring illnesses, and clearly diagnosed chronic diseases.
	Referral Services	Provide professional guidance on medical referral pathways for residents and assist in scheduling appointments with higher-level hospitals and diagnostic tests.
	Long-term Prescriptions	Issue long-term prescriptions for signed residents with clearly diagnosed, stable chronic diseases requiring ongoing medication.
	Medication Assessment	Provide timely medication consultation and guidance for residents and families during agreed-upon time slots (regular working hours and designated non-working hours).
Basic Public Health Services	Resident Electronic Health Records	Establish standardized electronic health records for residents with dynamic updates and management.
	Comprehensive Health Assessment	Conduct a comprehensive health assessment once a year for signed residents
	Personalized Health Plans	Develop a personalized annual health plan with clear goals and practical implementation strategies based on the health assessment results.
	Family Lifestyle Counseling	Offer timely guidance on health knowledge, psychological counseling, appropriate exercise, and balanced nutrition based on residents' health conditions and demands.
	Community Health Education	Notify and organize residents to participate in community health lectures, educational sessions, and seasonal disease prevention activities, as well as public health emergency awareness programs.
	Health Knowledge & Skills Training	Use community workshops, health management groups, and online platforms (such as WeChat) to promote health education, enhance health literacy, and improve self-management abilities for chronic disease patients.
Personalized Health Management Services	Home Bed Services	For residents suffering from stroke-induced paralysis and similar conditions, upon application and approval by the social security agency, a home hospital bed will be set up, and the signed healthcare team will provide home visits following service standards and guidelines.
	Home Visits	Upon residents' request and evaluation by the family doctor team, home visits will be provided if the home environment is deemed suitable for medical care.
Other Contracted Services	Additional 5 % Outpatient Reimbursement	After contracting, insured residents will receive a 5 % increase in outpatient reimbursement rates starting from the following month when seeking treatment at the signed primary care facility. The maximum outpatient reimbursement limit will also be increased by 200 CNY.

sued the "Regulations on Family Doctor Contracted Services in Tianjin" in 2022.[8] Tianjin has also optimized the "3+1+N" family doctor team structure (team member including 3 primary care professionals (medical doctor, nurse, public health physician), and 1 specialist, as well as allied health professionals), which emphasizes multidisciplinary collaboration. The teams aim to enhance professionalism and continue innovating in areas such as flexible contract plans and personalized family doctor services, ultimately improving residents' accessibility and satisfaction. By the May 2024, the program is expanded to 2557 family doctor teams, with coverage of 5 million individuals across the City.[9] For further improvement, the program will add more attention on quality of care instead of just number of contracts. However, the opinions of people on quality of the services were still unclear. The items of family doctor contracted services in Tianjin are detailed in Table 1.

The Kano Model, developed by Professor Noriaki Kano from the Tokyo Institute of Technology in 1984, combines the degree of achievement of a product's quality attributes with user satisfaction. This model constructs a two-dimensional cognitive framework of "quality attribute achievement- user perceived satisfaction".[10] Based on the relationship between a product's actual performance and the customer's subjective experience, the model categorizes a series of relational attributes within this framework, aiming to classify and prioritize customer demands.[11,12] It has since been widely applied to assess patient demands for healthcare services.[13,14]

Applied the Kano model, the current study aims to investigate community residents' demands for family doctor contracted services. It will analyze the differences in demands between residents of different ages and residents who have signed with family doctors versus who have not signed with family doctors. The study seeks to identify the priority of various service elements, for improving quality of family doctor contracted services, and provide evidence-based support for enhancing family doctor contracted policies in Tianjin.

Participants and research methods

Participants

The cross-sectional study was conducted from October 2023 to January 2024 in Tianjin City. The inclusion criteria included: 1) Aged 18–80 years; 2) Inhabited in Tianjin City for at least six months in the last year. The exclusion criteria included: 1) Residents who were unable attend the survey; 2) Residents who refused to participate. All participants provided informed consent and voluntarily took part in the survey. This study was approved by the Ethics Committee of Tianjin Medical University General Hospital (Ethics Review No: IRB-2023-KY-250).

Sample size

The sample size was calculated using the formula: $n = Z^2 \cdot p \cdot (1-p)/d^2$, where $p = 0.5$ (expected prevalence), $d = 0.05$ (precision corresponding to effect size), and $Z = 1.96$ (confidence level of 95 %). This calculation yields a minimum sample size of 384. To account for the expected questionnaire response rate and the need for stratified design, the sample size was increased to 600 to ensure enough number of people.

Sampling method

A stratified, cluster, multi-stage sampling method was applied. The steps are as follows:

Stage 1: Six urban districts and four suburban districts were categorized into three levels (high, medium, and low) based on economic development status. Two communities were randomly selected from each level, resulting in six communities.

Stage 2: The number of participants was evenly distributed across the six selected communities, i.e. 100 participants allocated to each community.

Stage 3: In each selected community, the number of participants was allocated based on distribution of aged groups (18–39 years: 40–59 years: ≥60 years = 2:2:1), as determined from relevant literature.[15] and field research. The minimum number of participants for each age group were estimated to be 40, 40, and 20, respectively. Eligible residents meeting the inclusion criteria were randomly selected. The target was to collect 600 completed questionnaires.

Questionnaire design

Formation of questionnaire design team: The design team was formed with reference to research objectives and target population. It

consisted of 3 GPs and 2 specialists from tertiary hospitals, and 3 family doctors from community health centres.

Questionnaire Design: the items of questionnaire were developed based on service categories which identified by the Tianjin Municipal Health and Family Planning Commission in 2017.[16] and the Tianjin Family Doctor Contracted Service Plans. The items were divided into three main sections: basic medical services (4 items), basic public health services (6 items), and personalized health management services (2 items), with additional alterative service item (1 category). In total, the questionnaire includes four categories and 13 items, as shown in Table 1. Following the Plans, the design team compiled the demands analysis and satisfaction sections of the questionnaire, maintaining scientific rigor and accuracy. Two leaders of family doctor team of community health centres and one statistical expert were invited to evaluate the quality of questionnaire for completeness, discrimination and convenience, further refining the survey tool.

The questionnaire consists of three main parts:

Part 1. Demographic Information: which includes gender, age, education level, and marital status.

Part 2. Family Doctor Contracted Service Demands: Based on the Kano model, this part includes 13 items, with each service item consisting of two questions: one positive and one negative. For example, "How would you feel if this service were provided?" and "How would you feel if this service were not provided?" Participants were invited to select the most appropriate answer from the following options: "definitely not like, "possibly not like"," "somewhat," "possibly like" and "definitely like".

Part 3. Satisfaction: which include 13 questions for Family Doctor Contracted Service Items. Participants rated their satisfaction in Likert scale: "strongly disagree," "disagree," "somewhat" "agree," and "strongly agree." This section is only for participants who signed the contract.

The draft questionnaire was tested pre the formal survey. 30 persons of Huayuan Ju Huali Community Activity Center of Nankai District were invited for the pilot. The pilot aimed for assessing the adaptability, modify any inappropriate items, for improving and finalizing the survey tool.

Kano model

The Kano model survey consists of two questions for each function/requirement: one positive and one negative. By combining the answers to the questions, 25 possible combinations were generated, each corresponding to a specific attribute in the Kano model. Based on the results, the attribute with the highest proportion was classified as the outcome for that demands. The classifications include: Indifferent (I), Must-Be (M), One-Dimensional (O), and Attractive (A).

When making quality improvements based on the attributes, priority should be given to Must-Be attributes, followed by One-Dimensional attributes, and finally Attractive attributes.[10,17]

Measuring and analyzing the satisfaction

Patient satisfaction refers to the extent to which patients are content with the medical services they receive. The level of satisfaction depends on how well the services meet the patient's demands and their overall experience. Satisfaction scoring: A 5-point Likert scale is used to assign scores ranging from 1 to 5 based on the categories of "strongly satisfied," "satisfied", "somewhat", "dissatisfied" and "strongly dissatisfied". A score of ≥ 4 is considered satisfied, while a score of <4 is regarded as dissatisfied. The service satisfaction score is calculated as follows: Service Satisfaction Score=(5.00 × strongly satisfied+4.00 × satisfied+3.00 × somewhat+2.00 × dissatisfied+1.00 × strongly dissatisfied)/number of participants.

Quality control of the survey

One GP was identified from each community as survey staff, and 10 survey staff underwent training prior to the survey. The training focused on two main areas: 1) Understanding the purpose and significance of the survey, and 2) Learning survey skills for conducting the survey. The survey staff assisted participants one-on-one to complete the questionnaires. Before the survey, participants were received information of the survey and provided their consent. During the survey, staff used an interview-assisted filling method to collect the data. Once the questionnaires were completed, two staff cross-checked all responses to ensure there were no duplications, omissions, or logical errors. Invalid questionnaires (34 in total) were excluded based on the following criteria: (1) fewer than 5 questions answered, or (2) responses showing a consistent answering pattern.

Statistical methods

Data were double-entered and organized using EPiData 3.1 software, and statistical analysis was performed with SPSS 27.0. Enumeration data were presented as frequencies (percentages), and measurement data were expressed as means±standard deviations. Descriptive analysis was used to evaluate patients' basic information, contracting status, reasons for not signed contract, and satisfaction levels. Using the Kano model, the researchers categorized and prioritized participants' demands for family doctor contracted services.

Results

Demographics and contracting status of participants

Of the 600 participants, 176 (29.3 %) were male, and 424 (70.7 %) were female; 238 (39.7 %) were aged 18–39 years, 238 (39.7 %) were aged 40–60 years, and 124 (20.7 %) were aged 60 years or older. Regarding education, 18 participants(3 %) completed elementary school or less, 60 participants(10 %) completed middle school, 88 participants(14.7 %) completed high school or vocational school, 358 participants(59.7 %) had bachelor's degree, and 76 participants(12.7 %) had higher degree. In terms of household registration, 482 participants(80.3 %) had urban household registration, while 118 participants(19.7 %) had rural household registration. For monthly income level, 131 participants(21.8 %) earned between 1000 and 3000 Chinese Yuan (CNY), 291 participants(48.5 %) earned between 3000 and 8000 CNY, 158 participants(36.3 %) earned between 8000 and 20,000 CNY, and 20 participants(3.3 %) earned 20,000 CNY or more. In terms of marital status, 159 participants(26.5 %) were unmarried, 376 participants(62.7 %) were married, and 65 participants(10.8 %) were divorced. Regarding health insurance, 341 participants(56.8 %) had urban employee health insurance, 212 participants(35.3 %) had urban-rural resident health insurance, and 47 participants(7.8 %) had no health insurance. Concerning chronic conditions, 318 participants(53 %) had underlying diseases, while 282 participants(47 %) did not. Of the participants, 266(44.3 %) had signed a family doctor contract, and 334(53.7 %) had not (see Table 2).

Kano demands analysis

Based on the Kano model, the demands for family doctor contracted services among participants was analyzed. The following were classified as Indifferent Attributes: health knowledge and skill development, community health education, and electronic health records. Must-Be Attributes included additional 5 % outpatient reimbursement, common disease diagnosis and treatment, and long-term prescriptions. One-Dimensional Attributes included home visits, family health lifestyle counseling, referral services, and comprehensive health assessments. At-

Table 2
Participants' basic information and contracting status.

Category	Signed	Non-signed	Total	Percentage (%)
Gender				
Male	76	100	176	29.3
Female	190	234	424	70.7
Age				
18–39 years	118	120	238	39.7
40–60 years	96	142	238	39.7
≥60 years	52	72	124	20.7
Educational level				
Primary school or below	14	4	18	3
Middle school	28	32	60	10
High school/Vocational school	38	50	88	14.7
Bachelor's degree	143	215	358	59.7
Master's degree or above	43	33	76	12.7
Household Registration				
Urban	206	276	482	80.3
Rural	60	58	118	19.7
Income Level (Monthly in CNY)				
1000–3000	72	59	131	21.8
3000–8000	110	181	291	48.5
8000–20,000	74	84	158	26.3
≥20,000	10	10	20	3.3
Marital Status				
Single	85	74	159	26.5
Married	163	213	376	62.7
Divorced	18	47	65	10.8
Medical Insurance				
Urban Employee Insurance	131	204	341	56.8
Urban/Rural Resident Insurance	102	121	212	35.3
No Insurance	33	9	47	7.8
Presence of Chronic Diseases				
No	152	166	318	53
Yes	114	168	282	47

Table 3
Kano model analysis results.

Function/Service	A (%)	O (%)	M (%)	I (%)	R (%)	Q (%)	Classification Result
Personalized Health Plans	33.83	17.67	18.67	20.50	6.83	2.50	Attractive Attribute
Community Health Education	6.67	28.00	11.33	30.83	19.50	3.67	Indifferent Attribute
Referral Services	15.17	29.33	16.00	24.83	10.50	4.17	One-dimensional Attribute
Additional 5% outpatient reimbursement	17.17	11.00	31.67	25.17	13.33	1.67	Must-be Attribute
Medication Assessment	29.67	27.00	13.67	17.17	9.17	3.33	Attractive Attribute
Common Disease Diagnosis and Treatment	18.33	15.50	31.00	23.17	7.33	4.67	Must-be Attribute
Home Visits	18.67	29.67	12.00	26.00	10.17	3.50	One-dimensional Attribute
Establishing Electronic Health Records	11.00	24.33	15.67	34.17	13.67	1.17	Indifferent Attribute
Family Lifestyle Counseling	18.17	29.5	11.67	26.33	12.50	1.83	One-dimensional Attribute
Long-term Prescriptions	19.00	16.67	39.00	16.00	9.00	0.33	Must-be Attributes
Comprehensive Health Assessment	13.83	31.83	26.00	15.00	12.83	0.50	One-dimensional Attribute
Health Knowledge and Skills Training	18.17	17.33	13.50	32.83	14.50	3.67	Indifferent Attribute
Home Bed Services	36.5	24.17	8.83	19.17	7.00	4.33	Attractive Attribute

tractive Attributes included personalized health plans, medication assessment, and home bed service, as shown in Table 3.

Age

The establishment of electronic health records and the development of health knowledge and skills are classified as Indifferent Attributes across all age groups. Personalized health plans is regarded as an Attractive Attribute for all age groups. Home visits are considered One-Dimensional Attributes across all age groups. Common disease diagnosis and treatment, additional 5 % outpatient reimbursement, and long-term prescriptions are Must-Be Attributes for the 40–50 and ≥60 age groups, while for the 18–39 age group, they are categorized as Must-Be, Attractive, and Indifferent Attributes, respectively.

Referral services and family lifestyle counseling are classified as One-Dimensional Attributes for the 40–50 and ≥60 age groups, and as Must-Be and Indifferent Attributes for the 18–39 age group, respectively. Comprehensive health assessments are One-Dimensional Attributes for the 18–39 and 40–59 age groups, but are Must-Be Attributes for the ≥60 age group. Medication assessment is considered an Attractive Attribute for the 18–39 and 40–59 age groups, while for the ≥60 age group, it is classified as a One-Dimensional Attribute. Community health education is categorized as Indifferent, One-Dimensional, and Must-Be Attributes for the 18–39, 40–59, and ≥60 age groups, respectively. Home bed service is classified as One-Dimensional, Attractive, and Must-Be Attributes for the 18–39, 40–59, and ≥60 age groups, respectively. Table 4.

Contracting status

The establishment of electronic health records and the development of health knowledge and skills are considered Indifferent Attributes for both participants who signed and did not sign the contract. Additional 5 % outpatient reimbursement is regarded as a Must-Be Attribute for both groups of signing status. Common disease diagnosis and treatment, community health education, and long-term prescriptions are considered Must-Be Attributes for both groups of participants, and One-

Table 4
Comparison of family doctor contracted service demands across different age groups based on the Kano model.

Function/Service	18–39 Years	40–59 Years	≥60 Years
Common Disease Diagnosis and Treatment	M	M	M
Referral Services	M	O	O
Long-term Prescriptions	I	M	M
Medication Assessment	A	A	O
Establishing Electronic Health Records	I	I	I
Comprehensive Health Assessment	O	O	M
Personalized Health Plans	A	A	A
Family Lifestyle Counseling	I	O	O
Community Health Education	I	O	M
Health Knowledge and Skills Training	I	I	I
Home Bed Services	O	A	M
Home Visits	O	O	O
Additional 5 % outpatient reimbursement	M	M	M

Notes:A:Attractive Attribute, O:One-dimensional Attribute, M:Must-be Attribute, I:Indifferent Attribute, R:Reverse Attribute, Q:Questionable Attribute

Table 5
Comparison of family doctor signed service demands between non-signed and signed groups based on the Kano model.

Function/Service	Non-signed participants	Signed participants
Common Disease Diagnosis and Treatment	O	M
Referral Services	M	O
Long-term prescriptions	I	M
Medication Assessment	A	O
Establishing Electronic Health Records	I	I
Comprehensive Health Assessment	O	A
Personalized Health Plans	O	A
Family Lifestyle Counseling	A	O
Community Health Education	I	M
Health Knowledge and Skills Training	I	I
Home Bed Services	O	A
Home Visits	O	A
Additional 5 % outpatient reimbursement	M	M

Notes:A:Attractive Attribute, O:One-dimensional Attribute, M:Must-be Attribute, I:Indifferent Attribute, R:Reverse Attribute, Q:Questionable Attribute

Dimensional Attributes and Indifferent Attributes for participants who did not sign the contract, respectively. Referral services, medication assessment, and family health lifestyle counseling are viewed as One-Dimensional Attributes for participants who signed the contract, and Must-Be Attributes and Attractive Attributes for participants who did not sign the contract, respectively. Comprehensive health assessments, personalized health plans, home bed service, and home visit are classified as Attractive Attributes for participants who signed the contract, and One-Dimensional Attributes for participants who did not sign the contract, as shown in Table 5.

Satisfaction of participants who signed the contract

The top five satisfaction scores include additional 5 % outpatient reimbursement (4.09 ± 1.14), long-term prescriptions (4.03 ± 1.14), electronic health records (3.55 ± 1.2), common disease diagnosis and treatment (3.29 ± 1.40), community health education (3.27 ± 1.2). The bottom five satisfaction scores are development of health knowledge and skills (3.14 ± 1.24), medication assessment (3.12 ± 1.26), referral services (3.11 ± 1.02), home bed service (2.97 ± 1.30), home visits (2.94 ± 1.21), as shown in Table 6.

Table 6
Satisfaction with family doctor contracted services among signed groups.

Function/Service	Satisfaction level	
	Mean	Standard Deviation
Common Disease Diagnosis and Treatment	4.09	1.14
Referral Services	4.03	1.14
Long-term Prescriptions	3.55	1.2
Medication Assessment	3.29	1.4
Establishing Electronic Health Records	3.27	1.2
Comprehensive Health Assessment	3.24	1.25
Personalized Health Plans	3.24	1.34
Family Lifestyle Counseling	3.2	1.3
Community Health Education	3.14	1.24
Health Knowledge and Skills Training	3.12	1.26
Home Bed Services	3.11	1.02
Home Visits	2.97	1.3
Additional 5 % outpatient reimbursement	2.94	1.21

Discussion

Research on relationship between provision and demands of family doctor contracted services in China is limited. Few previous studies focused on perspective of demand side. The current study, which focuses on community residents in Tianjin City, uses the Kano model to explore the opinions of people toward core services. The findings provide valuable insights for optimizing the planning and improvement of family doctor contracted services.

Overall population demands analysis

The study reveal significant variations in residents' perceptions of different service attributes. Basic services, such as health knowledge and skill development, community health education, and electronic health records, were categorized as Indifferent Attributes. This finding suggest

that while the services are essential, people thinking they have limited impact on satisfaction. This aligns with Zhang Tian et al.'s findings.[18] In contrast, medical services, such as additional 5 % outpatient reimbursement, common disease diagnosis and treatment, and long-term prescriptions, were categorized as Must-Be Attributes. The services reflect the essential demands for basic medical security. This finding is consistent with prior studies. For example, Huang Jiaoling et al[19,20] highlighted that medication services are among the primary demands. Similarly, Shang X[21] demonstrated that over 80 % of people are concerned about health insurance reimbursement. Advanced services, such as home visits, family lifestyle counseling, referral services, and comprehensive health assessments, were categorized as One-dimensional Attributes, which suggests that the availability of the services is positively correlated with patient satisfaction. Zhu Xiaoyan et al,[22] in their analysis of family doctor contracted services based on demographic characteristics, found that residents prefer home bed service. The "Guidelines of Promoting the Construction of a Tiered Medical System" of the General Office of the State Council also emphasized the importance of referral services.[23] Notably, innovative services such as personalized health plans, medication assessment, and home bed service were categorized as Attractive Attributes. The services have significant potential to enhance satisfaction, although their absence does not lead to considerable dissatisfaction. Primary care providers should focus on ensuring the availability of essential medical services while also addressing primary care demands and improving service accessibility, which will enable people to receive medical care conveniently in their home.[24]

Differences in demands across different age groups

Demands of elderly (≥60 years)

This study reveals that elderly have a strong reliance on essential services such as additional 5 % outpatient reimbursement, long-term prescriptions, and common disease diagnosis and treatment, highlighting their significant demands for affordability and medication safety. This is directly linked to the high prevalence of chronic diseases within this group.

The primary demands of the elderly focus on continuous chronic disease management, which aligns with the findings of Sun Huajun et al.[25] Improving healthcare accessibility and expanding the list of reimbursed medicines can notably enhance elderly's satisfaction with family doctor contracted services.[26] Thus, it suggested enhancing chronic disease management capabilities for the elderly, optimising outpatient reimbursement policies, and promoting long-term prescription services in primary care facilities. Furthermore, the study shows that elderly place high importance on community health education, categorized as a Must-Be Attributes. Research by Gu Ziwei et al[27] also indicates that 74.3 % of elder people have health education demands, with urban elderly expressing higher demands than rural elderly, this is likely due to the higher educational levels among urban older people.[28] While existing health education content addresses some of the demands, improvements can still be made in terms of format and relevance. For example, organizing health lecture on elderly-specific health issues or increasing interactivity through community activities could be more effective in promoting elderly engagement and satisfaction. For rural populations, it is important to provide health education services that are simpler and easier to understand. In addition, home bed service are considered a Must-be Attribute for the elderly, while home visits are considered as an One-dimensional Attribute. However, the services are provided insufficiently and often fail to meet actual demands. This is closely related to the elderly's declining physical capabilities, high prevalence of chronic conditions, and the ongoing demands for regular medication and medical support. The findings are consistent with prior research by Han Yan et al.[29] To address this gap, the researchers suggest strengthening policy support and technological innovations, such as telemedicine and smart health monitoring devices, be used to enhance the accessibility of home visits. Additionally, exploring standardized models for home bed service would be beneficial.

Demands of middle-aged (40–59 years)

The demands of the middle-aged are shaped by the demands for upgraded health management and the pressures of their family responsibilities. Firstly, middle-aged experienced increase of health risks, their demands for chronic disease prevention and comprehensive health assessments (One-dimensional Attributes) is significantly higher than that of other age groups. This reflects their heightened awareness of health risks. Therefore, family doctor contracted services should focus on a more systematic and proactive approach to health management, offering comprehensive health assessments and personalized health plans.

Secondly, middle-aged carried dual responsibility of caring for both children and elderly parents, resulting in a higher demands for health management and medical resources for families, particularly medication assessment (One-dimensional Attribute) and home bed service (Attractive Attribute). Medication assessment is crucial for middle-aged, while home bed service have the potential to greatly increase satisfaction if offered. Therefore, family-centered health management could better address the diverse demands of the middle-aged people. The "Guidelines on Promoting Family Doctor Contracted Services"[30] recommends family-based contracts, which align closely with the demands of middle-aged people. Previous studies have demonstrated that interventions involving both patients and their family members yield more effective results, leading to significant symptom improvements.[31]

Demands of the young population (18–39 years)

Young people prioritize efficiency. Due to conflicts between working hours and community service business hours, there is a particularly strong demands for flexible medical services of young people.[32] The study identified that referral services are considered essential by many young participants; however, their actual utilization and effectiveness are significantly low.[18,33,34] It is recommended to optimize the referral process through digital platforms, such as establishing an online referral system that ensures connectivity between medical institutions. Additionally, strengthening support for primary care facilities is crucial to enhance their diagnostic and treatment capabilities. While the overall health status of the young people is relatively good, with a less disease burden, there is a notable demands for the common disease diagnosis and treatment (Must-be Attributes) and the prevention of occupational diseases.[35,36] Additional 5 % outpatient reimbursement (Attractive Attribute) needs both the provision of common disease diagnosis and treatment and optimization of outpatient reimbursement policies. It is also important to highlight that the potential demands for medication assessment (Must-be Attribute) and home bed service (One-dimensional Attribute) remains underexplored in this group. Therefore, it is advised to gradually introduce the services, where resources allow, and to offer personalized health plans tailored to the unique demands of young people.

Demands between people signed and did not sign the contract

This study reveals that the demands of residents who have signed with family doctors are mainly driven by core guarantee concerns, with a focus on Must-be Attributes such as additional 5 % outpatient reimbursement and common disease diagnosis and treatment. However, there remains a gap in the provision of One-dimensional Attributes, such as referral services and medication assessment. While services like comprehensive health assessments and personalized health plans, categorized as Must-be Attributes, may enhance satisfaction, their absence does not cause significant dissatisfaction. This suggests that the current services primarily meet basic demands and have not yet evolved to meet higher expectations. Residents who have not signed with family doctors display reliance on institutional security and a delayed recognition of

service value. The study shows that additional 5 % outpatient reimbursement and referral services are Must-be Attributes, highlighting a strong demand for basic medical security and tiered diagnosis and treatment systems among potential residents who want to sign with family doctors. In contrast, medication assessment and family lifestyle counseling are Must-be Attributes, indicating that residents who have not signed with family doctors have not fully realized the value of family health management. This finding could be due to information asymmetry, a mismatch between service supply and demands, limited accessibility and flexibility, and doubts about the effectiveness of services. Previous studies[37,38] suggest that people's understanding of family doctor contracted services is a critical factor influencing the contracting coverage.

Limitations

Firstly, there is a risk of dual bias in the sample selection. On one hand, the study only included residents from community activity centers, excluding key groups of dwellings in demands of community health services, such as those who are homebound, bedridden, paralyzed, or have mobility impairments, which limits the representativeness of the participants toward the community population. On the other hand, the satisfaction survey was conducted only among residents who signed the contract, yet it included two special groups: residents who signed the contract but did not seek any services ("signed but no services"), and those who did not use the services at all. The findings of the study may not accurately reflect the experiences of the individuals who actually benefited from the services. Secondly, the questionnaire used in this study was a self-designed non-structured questionnaire based on relevant literature, and it did not undergo validity and reliability testing. Lastly, since this was a cross-sectional study, the results only show correlations between factors but cannot establish causality. Future research could expand the sample size, include a wider range of populations, and further investigate the factors influencing family doctor contracted services, which would provide quality evidence for the development of family doctor contracted policies and services.

Conclusion and recommendations

The current study applied the Kano model to analyze the demands for and satisfaction with family doctor contracted services among community people in Tianjin City. Significant differences were found in the demands for family doctor contracted services across different age groups and contracting status. The findings support the suggestion of tailoring the family doctor contracted service with specific demands of various demographic groups. Moreover, there is a demands to enhance the promotion and delivery of family health management services, particularly for residents who have not signed with family doctors. By offering targeted health education and service innovations, the contracting coverage can be improved.

Authors' contributions

Conceptualization, L.P., L.Y. and P.L.; Methodology, L.P., L.Y. and P.L.; Data curation, L.P., L.Y. and P.L.; Formal analysis, L.P., L.Y. and P.L.; Funding acquisition, not applicable; Project administration, not applicable; Resources, not applicable; Supervision, B.B.; Validation, B.B.; Writing—original draft, J.J. and Z.N.; Writing—review and editing, B.B.; All authors have read and agreed to the published version of the manuscript.

Ethical approval and consent to participate

The study received approval from Tianjin Medical University General Hospital (IRB-2023-KY-250).

Consent for publication

Not applicable.

Availability of data and materials

Not applicable.

Competing interests

All authors declare that there are no competing interests.

Funding

Not applicable.

Authors' other information

Not applicable.

Acknowledgements

Not applicable.

References

1. National Health Commission of the People's Republic of China. Guiding opinions on standardizing Family doctor contract services management [EB/OL]. 2018-09-29 [cited 2024-11-20]. Available from: https://www.gov.cn/zhengce/zhengceku/2018-12/31/content_5435461.htm.
2. Zhang X. Tian WH. The "gatekeeper" role of the family doctor system and its implications for China. *Chin J Soc Med*. 2013;30(2):115–117. doi:10.3969/j.issn.1673-5625.2013.02.016.
3. Huang FH, Li HY. Research progress on the family doctor system in China. *Chin J Geriatr*. 2019;39(7):1771–1776. doi:10.3969/j.issn.1005-9202.2019.07.079.
4. State Council Medical Reform Office. Guiding opinions on promoting Family doctor contract services [EB/OL]. 2024-11-20 [cited 2024-11-20]. Available from: https://www.gov.cn/gongbao/content/2016/content_5124373.htm.
5. Tianjin Municipal Health Commission. Family doctor contract services are now implemented citywide [EB/OL]. 2017-06-01 [cited 2024-11-20]. Available from: https://wsjk.tj.gov.cn/XWZX6600/MTBD3030/202008/t20200828_3584383.html.
6. Tianjin Municipal Health Commission. Family doctor contract services launched [EB/OL]. 2017-02-04 [cited 2024-11-20]. Available from: https://wsjk.tj.gov.cn/XWZX6600/MTBD3030/202008/t20200828_3583840.html.
7. Tianjin Municipal Health Commission. Multiple measures to enhance medical service capacity and nearly 4 million sign family doctor contracts [EB/OL]. 2022-09-08 [cited 2024-11-20]. Available from: https://wsjk.tj.gov.cn/XWZX6600/MTBD3030/202209/t20220908_5983679.html.
8. Standing Committee of the Tianjin Municipal People's Congress. Several regulations on family doctor contract services in Tianjin [EB/OL]. 2022-12-01 [cited 2024-11-20]. Available from: https://www.tjrd.gov.cn/xwzx/system/2022/12/01/030026619.shtml.
9. Striving for 5 million family doctor contracts by 2025 [EB/OL]. 2023-11-15 [cited 2024-11-20]. Available from: https://wsjk.tj.gov.cn/XWZX6600/MTBD3030/202311/t20231116_6457657.html.
10. Kano N, Seraku N, Takahashi F, et al. Attractive quality and must-be quality. *J.*. 1984.
11. Ku GC, Shang IW. Using the integrated Kano-RIPA model to explore teaching quality of physical education programs in Taiwan. *Int J Environ Res Public Health*. Jun 3 2020;17(11). doi:10.3390/ijerph17113954.
12. Lin FH, Tsai SB, Lee YC, et al. Empirical research on Kano's model and customer satisfaction. *PLoS One*. 2017;12(9):e0183888. doi:10.1371/journal.pone.0183888.
13. Yuan Y, Tao C, Yu P, et al. Demand analysis of telenursing among empty-nest elderly individuals with chronic diseases based on the Kano model. *Front Public Health*. 2022;10:990295. doi:10.3389/fpubh.2022.990295.
14. Wang Z, Tang X, Li L, et al. Spiritual care needs and their attributes among Chinese inpatients with advanced breast cancer based on the Kano model: a descriptive cross-sectional study. *BMC Palliat Care*. Feb 22 2024;23(1):50. doi:10.1186/s12904-024-01377-8.
15. Tianjin Municipal Bureau of Statistics. The 7th national census major data bulletin of Tianjin (No. 2) [EB/OL]. 2021-05-21 [cited 2024-11-20]. Available from: https://stats.tj.gov.cn/tjsj_52032/tjgb/202105/t20210521_5457330.html.
16. Tianjin Municipal Health Commission. 2020 to achieve full coverage of Family doctor contract services [EB/OL]. 2017-03-10 [cited 2024-11-20]. Available from: https://wsjk.tj.gov.cn/XWZX6600/MTBD3030/202008/t20200828_3584020.html.
17. A Corbella Jané, Citizens' Maturana Domínguez S. role in health services: satisfaction behavior: Kano's model, part 2. *Qual Manag Health Care*. 2003;12(1):72–80 Jan-Mar. doi:10.1097/00019514-200301000-00011.

18. Zhang T, Miao YD, Gu JQ. Utilization and satisfaction of Family doctor contract services in Zhengzhou. Chinese general practice. 2020;23(1):45–50. DOI: 10.12114/j.issn.1007-9572.2019.00.692.
19. Huang JL, Song JQ, Wu JP, et al. Analysis of factors influencing residents' family doctor contract behavior: the role of contract demand. *Chin Health Serv Manag*. 2020;37(11):811–814 863.
20. Huang JL, Zhang YM, Liu SS, et al. Demand and influencing factors of family doctor contract services in Hongkou District, Shanghai. *China Health Policy Res*. 2019;12(8):54–61. doi:10.3969/j.issn.1674-2982.2019.08.009.
21. Shang X, Huang Y, Li B, et al. Residents' Awareness of Family doctor contract services, status of contract with a Family doctor, and contract service needs in Zhejiang Province, China: A cross-sectional study. *Int J Environ Res Public Health*. Sep 9 2019;16(18). doi:10.3390/ijerph16183312.
22. Zhu XY, Liu Q, Ding L, et al. Analysis of family doctor contract service demand based on demographic characteristics. *China Primary Health Care*. 2021;35(11):26–31. doi:10.3969/j.issn.1001-568X.2021.11.0009.
23. General Office of the State Council. Opinions on promoting the construction of a hierarchical medical system [EB/OL]. 2015-09-11 [cited 2024-11-20]. Available from: https://www.gov.cn/zhengce/content/2015-09/11/content_10158.htm#:~:text.
24. Zhang JX, Jin X, Zhou GP, et al. A qualitative study on family doctor teams' views on home-based medical services for elderly people in the community. *Chin J Gen Pract*. 2023;22(3):278–282. doi:10.3760/cma.j.cn114798-20220614-00632.
25. Sun HJ, Lan KY, Zhang YX, et al. Analysis of family doctor contract service demand among elderly people in Tianjin. *China Med Manag Sci*. 2021;11(5):78–83. doi:10.3969/j.issn.2095-7432.2021.05.017.
26. Chen A, Feng S, Tang W, et al. Satisfaction with service coverage and drug list may influence patients' acceptance of general practitioner contract service: a cross-sectional study in Guangdong, China. *BMC Health Serv Res*. 2019;19(1):251 Apr 24. doi:10.1186/s12913-019-4053-x.
27. Gu ZW, Hu Y. Survey on family doctor contract and service demand among elderly people in the community. *J Nanjing Med Univ (Soc Sci Ed)*. 2021;21(1):83–88. doi:10.7655/nydxbss20210117.
28. Liu GQ, Jia YZ, Liu QL, et al. Investigation of health service demand among elderly people in Zhanggong District, Ganzhou City based on family doctor services. *China Primary Health Care*. 2023;37(1):26–29. doi:10.3969/j.issn.1001-568X.2023.01.0008.
29. Han Y, Du XP, Dong JQ. Survey on community health service demand among elderly people with family doctor-style contract services. *Chin Gen Pract*. 2017;20(31):3929–3932. doi:10.3969/j.issn.1007-9572.2017.31.019.
30. National Health Commission of the People's Republic of China. Guidelines on promoting the high-quality development of family doctor contract services [EB/OL]. Mar 3, 2022 [cited 2024 Nov 20] Available from: https://www.gov.cn/zhengce/zhengceku/2022-03/15/content_5679177.htm.
31. Lu P, Pan GJ, Wang X, et al. Analysis of the effect of family-based contract management on community elderly hypertension management. *J Lab Med Clin*. 2017;14(Z1):307–309. doi:10.3969/j.issn.1672-9455.2017.25.155.
32. Meng CL, Chen LL, Deng P, et al. Analysis of demand for family doctor contract services among uncontracted middle-aged and young residents in Baoshan District. *Shanghai Chin J Gen Prac*. 2023;22(4):379–385. doi:10.3760/cma.j.cn114798-20220701-00718.
33. Meng W, Yu Q, Peng H, et al. Evaluation and countermeasures of contracted services of Chinese family doctors from demanders' point of view - a case study of a city. *BMC Health Serv Res Dec 16*. 2022;22(1):1534. doi:10.1186/s12913-022-08891-6.
34. Zhao J, Liu FY, Li Z, et al. Research on satisfaction with family doctor contract services in Beijing — Based on the patient's perspective. *Health Econom Res*. 2022;39(1):54–58. doi:10.14055/j.cnki.33-1056/f.2022.01.016.
35. Xu J, Yao G, Pan WL, et al. Research on the satisfaction and influencing factors of family doctor contract service demand among middle-aged and young urban office workers. *Chin Gen Pract*. 2022;25(22):2782–2789. doi:10.12114/j.issn.1007-9572.2022.0009.
36. Cui YQ, Hao Y, Liu TX, et al. Personalized needs of family doctor contract services among middle-aged and young office workers in urban areas. *Chin Gen Pract*. 2021;24(16):2039–2043. doi:10.12114/j.issn.1007-9572.2021.00.049.
37. Ke SS, Guo Y, Yan YQ. Analysis of family doctor contract status and influencing factors among residents in Wuhan. *Chin Health Educ*. 2022;38(11):1022–1027. doi:10.16168/j.cnki.issn.1002-9982.2022.11.012.
38. Wu YQ, Li HM, Chen AQ, et al. Analysis of family doctor contract service status and influencing factors among residents in Jiangsu Province. *Mod Prev Med*. 2020;47(4):631–634. doi:10.20043/j.cnki.mpm.2020.04.013.