Chinese General Practice Journal 2 (2025) 100047

Contents lists available at ScienceDirect

Chinese General Practice Journal

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

Evaluation and measurement of primary care services based on patients' experience in China ☆

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ARTICLE INFO

Key words:
Primary health services
Primary health care
Quality of health care
General practice core characteristic functions
Family doctor contracted services
Patient experience

ABSTRACT

Background: Patients' experience is a critical aspect for evaluating the quality of primary care services. However, research on patient experience in China started relatively late, with limited focus on patients in primary care facilities.

Objective: To reflect the status of primary care services in China based on the experience of patients visiting primary care facilities.

Methods: From March to April 2023, a cross-sectional survey was conducted using intercept sampling in 12 national pilot zones for primary healthcare reform. Investigators, trained in survey techniques, administered the Assessment Survey of Primary Care (ASPC) scale to 1,157 patients at 36 primary care facilities, including township health centers and community health centers.

Results: The average scores for five dimensions were: 69.5±20.5 for first visit/first-line care, 74.1±20.1 for service accessibility, 72.0±20.7 for continuity of doctor-patient relationships, 75.1±21.0 for comprehensive services, and 68.5±21.7 for coordinated services. The overall ASPC score was 71.8±17.3. Significant differences ($P<0.05$) were found based on age, education level, employment status, family doctor enrollment, self-reported chronic conditions and pilot zone. Multivariate regression analysis identified age, employment status, family doctor enrollment, and pilot zone as significant influencing factors for scores in various dimensions. Unemployed patients scored lower across all dimensions compared to employed patients ($P < 0.05$). Patients with a family doctor contract had higher scores across all dimensions compared to those without a contract ($P < 0.05$). Significant regional differences in scores were found, with higher scores in Changting and Xishui counties compared to Jiexiu city ($P < 0.05$), and lower scores in Haiyan, Lu, and Dongfang cities compared to Jiexiu ($P < 0.05$).

Conclusion: The ASPC scale effectively reflects the current state of primary care services in China. The family doctor contracted services improve patient experiences in primary care facilities, particularly in the dimensions of accessibility, doctor-patient continuity, and coordination. Regional variations in patient experiences are linked to "patient-centered" approaches and convenience measures.

The "patient-centered" approaches means to consider issues from the patient's perspective, aligning with the focus of patient experience. It emphasizes on patients' real experiences and perceptions during healthcare visits. The approaches serve as both an intuitive expression of how patients utilize healthcare services and an essential tool for improving medical services through feedback and evaluation.[1] Patient experience evaluation is considered as the core of healthcare quality. The experience of patients in primary care facilities is a key measurement for the quality of primary care services.

Research on patient experience in China started relatively late, with even fewer studies focusing on service experiences of patients in primary care facilities. LI et al.[2] and KUANG et al.[3], developed the Assessment Survey of Primary Care (ASPC) scale based on the structure of the healthcare system, service utilization contexts, and cultural cognition in China. This scale fits the characteristics of primary care services and reflects patients' experiences after receiving primary care services.

The study aims to analyze the patient experience scores and the influencing factors across different pilot zones, and to reflect the influence of primary healthcare reform policies on accessibility, continuity,

☆ The Chinese version of this paper was published in Chinese General Practice on [2025-03-17] (DOI:10.12114/j.issn.1007-9572.2024.0275). The current English paper is a compliant secondary publication by Chinese General Practice Journal after obtaining copyright permission from both the authors and Chinese General Practice.

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https://doi.org/10.1016/j.cgpj.2025.100047

comprehensiveness, and coordination in primary care services, utilizing the ASPC scale to survey patients in 12 national primary care pilot zones.

Methods

Participants

12 pilot zones were selected as sampling regions: Jiexiu City (Shanxi Province), Haiyan County (Zhejiang Province), Suixi County (Anhui Province), Changting County (Fujian Province), Shouguang City (Shandong Province), Jia County (Henan Province), Luxian County (Sichuan Province), Xinyuan County (Xinjiang Uyghur Autonomous Region), Miyun District (Beijing), Shangsi County (Guangxi Zhuang Autonomous Region), Dongfang City (Hainan Province), and Xishui County (Guizhou Province). A completely random sampling method was used to select 3 townships or streets from each pilot zone. Patients from township health centers or community health centers were then selected through intercept sampling, with at least 30 patients surveyed in each selected township or street. The total number of patients surveyed across these 12 pilot areas was 1157, exceeding the target of 1080.

The inclusion criteria were as follows: (1) able to understand the instruction and questions of the survey and willing to participate after being informed of the purpose of the study; (2) treated by primary care facilities being surveyed; (3) number of visits ≥three times within the past year. Individuals with mental, language, visual, or auditory impairments and who were unable to complete the survey due to their physical condition were excluded.

Survey tools

(1) Patients Visiting Primary Care Facilities Survey Questionnaire
Developed by the National Health Development Research Center of the National Health Commission of China, the questionnaire contains sections on basic information, experiences of primary care services, and satisfaction with these services. The relevant items for this study include gender, age, education level, marital status, employment status, family doctor enrollment, and self-reported chronic conditions.

(2) Simplified ASPC Scale
This scale was developed by the Basic Medical Group of the School of Public Health, Sun Yat-sen University, based on international experience. It consists of 10 items across five dimensions: “First-contact” care (“I always visit a community doctor/team first when I feel unwell.”, “I always seek advices from a community doctor/team for health or disease-related concerns.”), service accessibility (“I can always access a community doctor/team during clinic hours.”, “I can always access a community doctor/team at night.”), continuity of doctor-patient relationship (“I always consult with the same doctor for each visit.”, “The doctor/team is familiar with my past medical history.”), comprehensiveness (“I have received guidance and advices on a healthy diet from my community doctor/team.”, “I have received health screening and consultation from my community doctor/team.”), coordination (“Before visiting a higher-level hospital, I always consult with my community doctor/team.”, “The community doctor always discusses referral reasons with me.”).

All items on the scale use a 4-point Likert scale: “Never” = 1 point, “Sometimes” = 2 points, “Often” = 3 points, “Always” = 4 points, “Don’t know/Not sure” = 2.5 points.

The score for each dimension is the average of the scores for all items within that dimension. The total score for the scale is the average of all dimension scores. To enhance the clarity of the results, scale scores were converted to a percentage format: Percentage Score=Scale Score ÷ 4 × 100. A higher percentage score indicates better patient experience with the core function of primary care.[2-3] In this study, the cumulative explained variance of the scale was 61.2 %, and the Cronbach’s α coefficient was 0.912. The Cronbach’s α coefficients for each

Table 1
Basic characteristics of the surveyed patients in the national comprehensive primary health care pilot zones in 2023.

Pilot zone	Cases	Gender	Age ($\bar{x}\pm s$, years)	Education level [Cases (%)]			Marital status [Cases (%)]			Employment status [Cases (%)]					Family doctor contract [Cases (%)]	Chronic disease [Cases (%)]
				Junior high school or below	High school/ technical school	College or above	Unmarried	Married	Divorced/ widowed	Employed	Retired	Unemployed	None	Student		
Jiexiu City	138	48/90	51.5±14.8	55 (39.86)	39 (28.26)	44 (31.88)	10 (7.25)	123 (89.13)	5 (3.62)	55 (39.86)	34 (24.64)	10 (7.25)	37 (26.81)	2 (1.45)	97 (70.29)	60 (43.48)
Haiyan County	90	42/48	46.4±16.4	37 (41.11)	22 (24.44)	31 (34.44)	6 (6.67)	81 (90.00)	3 (3.33)	70 (77.78)	8 (8.89)	0	11 (12.22)	1 (1.11)	65 (72.22)	24 (26.67)
Suixi County	92	42/50	53.4±18.2	75 (81.52)	13 (14.13)	4 (4.35)	4 (4.35)	83 (90.22)	5 (5.43)	33 (35.87)	10 (10.87)	2 (2.17)	43 (46.74)	4 (4.35)	55 (59.78)	26 (28.26)
Changting County	90	52/38	54.8±15.1	73 (81.11)	9 (10.00)	8 (8.89)	7 (7.78)	76 (84.44)	7 (7.78)	40 (44.44)	7 (7.78)	1 (1.11)	39 (43.33)	3 (3.33)	70 (77.78)	39 (43.33)
Shouguang City	94	34/60	39.3±11.8	34 (36.17)	15 (15.96)	45 (47.87)	12 (12.77)	80 (85.11)	2 (2.13)	76 (80.85)	1 (1.06)	3 (3.19)	9 (9.57)	5 (5.32)	81 (86.17)	18 (19.15)
Jiaxian County	90	44/46	64.1±13.2	79 (87.78)	9 (10.00)	2 (2.22)	3 (3.33)	76 (84.44)	11 (12.22)	26 (28.89)	0	1 (1.11)	63 (70)	0	82 (91.11)	47 (52.22)
Luxian County	93	37/56	48.6±18.2	56 (60.22)	18 (19.35)	19 (20.43)	10 (10.75)	77 (82.8)	6 (6.45)	40 (43.01)	11 (11.83)	6 (6.45)	33 (35.48)	3 (3.23)	66 (70.97)	23 (24.73)
Xinyuan County	95	41/54	56.3±12.4	88 (92.63)	7 (7.37)	0	0	90 (94.74)	5 (5.26)	11 (11.58)	16 (16.84)	4 (4.21)	64 (67.37)	0	66 (69.47)	26 (27.37)
Miyun District	93	33/60	41.6±12.0	27 (29.03)	10 (10.75)	56 (60.22)	7 (7.53)	82 (88.17)	4 (4.30)	71 (76.34)	3 (3.23)	1 (1.08)	16 (17.2)	2 (2.15)	82 (88.17)	18 (19.35)
Shangsi County	115	51/64	56.7±17.7	88 (76.52)	16 (13.91)	11 (9.57)	11 (9.57)	90 (78.26)	14 (12.17)	41 (35.65)	20 (17.39)	2 (1.74)	49 (42.61)	3 (2.61)	44 (38.26)	35 (30.43)
Dongfang City	71	34/37	41.8±14.5	25 (35.21)	18 (25.35)	28 (39.44)	6 (8.45)	62 (87.32)	3 (4.23)	50 (70.42)	3 (4.23)	0	17 (23.94)	1 (1.41)	32 (45.07)	13 (18.31)
Xishui County	96	46/50	43.5±17.4	66 (68.75)	14 (14.58)	16 (16.67)	15 (15.63)	81 (84.38)	0	43 (44.79)	1 (1.04)	3 (3.13)	43 (44.79)	6 (6.25)	51 (53.13)	17 (17.71)
x^2 (F)		19.693	12.434[a]	296.623			52.001			322.531					136.517	64.811
P		0.050	<0.001	<0.001			<0.001			<0.001					<0.001	<0.001

Table 2
Scores of ASPC scale of the surveyed Patients in the national comprehensive primary health care pilot zones in 2023.

Pilot zone	Cases	First consultation/ primary care (x̄±s)	Service accessibility	Doctor-Patient relationship continuity (x̄±s)	Comprehensive service (x̄±s)	Coordinated service (x̄±s)	Total score (x̄±s)
Jiexiu City	138	70.0±17.9	74.7±17.2	74.8±17.7	76.7±17.4	70.7±18.4	73.4±14.7
Haiyan County	90	65.8±21.0	67.1±21.0	65.2±22.7	67.6±24.3	62.2±21.2	65.6±19.6
Suixi County	92	69.3±18.6	71.7±20.3	69.6±18.0	69.6±18.8	67.8±19.0	69.6±16.3
Changting County	90	78.5±17.7	88.6±10.9	85.3±15.2	84.0±17.8	83.6±16.5	84.0±10.9
Shouguang City	94	70.6±21.5	76.7±19.6	78.0±19.4	80.1±20.4	77.1±21.3	76.5±17.9
Jiaxian County	90	72.9±20.5	72.1±17.4	81.6±16.9	79.4±18.2	62.6±17.0	73.7±14.2
Luxian County	93	58.5±19.7	62.0±21.1	66.1±19.8	68.0±18.9	56.5±15.5	62.2±14.6
Xinyuan County	95	69.2±17.4	71.8±20.4	67.2±22.4	73.4±21.2	66.3±23.8	69.6±19.2
Miyun District	93	68.8±17.4	75.4±18.8	74.1±14.6	80.0±18.1	75.2±18.9	74.7±15.2
Shangsi County	115	76.1±24.2	80.1±20.0	61.7±24.6	75.8±25.1	60.7±26.1	70.9±15.9
Dongfang City	71	58.8±18.3	66.3±19.4	63.3±17.4	63.5±18.8	60.0±18.2	62.4±15.7
Xishui County	96	71.6±22.2	79.0±20.6	76.6±21.2	79.4±22.4	78.1±22.9	76.9±20.3
F		7.993	12.502	14.063	8.364	16.379	13.152
P		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

dimension were all greater than 0.89, indicating good reliability and validity of the questionnaire.

Survey and quality control methods

In each pilot zone, 2 to 4 investigators with professional knowledge, strong responsibility, meticulous work habits, and good interpersonal skills were selected and trained online by the research team from the National Health Commission's Health Development Research Center. From March to April 2023, the investigators in each pilot zone conducted face-to-face surveys with patients at the selected township health centers or community health centers, using an interception method. After completing the surveys, valid questionnaires were entered into the database, while the invalid ones were excluded. During the data entry process, strict quality control measures were implemented to ensure data accuracy and completeness. Before analysis, the database was checked for logical errors and inconsistencies.

Statistical methods

A database was created using EpiData 3.1 software, and data entry was performed accordingly. Data analysis was conducted with SPSS 26.0 statistical software. Counting data were presented as frequencies, and group comparisons were made using the χ^2 test. For normally distributed measurement data, results were expressed as mean±standard deviation (x̄±s). Independent samples *t*-tests were used for comparisons between two groups, while one-way analysis of variance (ANOVA) was applied for comparisons among multiple groups. Multiple linear regression analysis was used to explore the factors influencing the ASPC scale scores of patients. The significance level was set at α= 0.05.

Results

Basic characteristics of primary care patients

A total of 1,157 primary care patients were investigated, including 504 males (43.56 %) and 653 females (56.44 %). The average age was 50.1±16.8 years. In terms of education level, 703 patients (60.76 %) had an education level of junior high school or below, 190 patients (16.42 %) had completed high school, vocational school, or technical school, and 264 patients (22.82 %) had a college education or above. Regarding marital status, 91 patients (7.87 %) were unmarried, 1,001 patients (86.52 %) were married, and 65 patients (5.61 %) were divorced or widowed. Employment status was as follows: 556 patients (48.06 %) were employed, 114 patients (9.85 %) were retired, 424 patients (36.65 %) were unemployed, 33 patients (2.85 %) were laid off, and 30 patients (2.59 %) were students. The family doctor contract rate was 68.37 % (791/1,157), and the chronic disease prevalence was 29.90 % (346/1,157). Comparison of gender across different pilot zones showed no significant differences ($P > 0.05$). However, significant differences were observed in terms of age, education level, marital status, employment status, family doctor contracted status, and self-reported chronic conditions ($P < 0.05$). Details are shown in Table 1.

ASPC scale scores of patients visiting primary care facilities

A total of 1,157 patients reported their scores across five dimensions of the ASPC scale: "First-contact" care, service accessibility, continuity of the doctor-patient relationship, comprehensive services, and coordinated services. The mean scores for these dimensions were 69.5±20.5, 74.1±20.1, 72.0±20.7, 75.1±21.0, and 68.5±21.7, respectively. The overall mean score on the ASPC scale was 71.8±17.3. Comparisons of the scores for the five dimensions, as well as the total ASPC score, across different pilot zones revealed statistically significant differences ($P< 0.05$), as shown in Table 2.

Among the pilot zones, the highest mean scores for the "First-contact" care dimension were recorded in Changting County (78.5), Shangsi County (76.1), and Jia County (72.9). For the service accessibility dimension, the highest mean scores were observed in Changting County (88.6), Shangsi County (80.1), and Xishui County (79.0). Regarding the continuity of the doctor-patient relationship dimension, the highest mean scores were found in Changting County (85.3), Jia County (81.6), and Shouguang City (78.0).

Regarding the comprehensive services dimension, the highest mean scores were noted in Changting County (84.0), Shouguang City (80.1), and Miyun District (80.0). The highest mean scores for the coordinated services dimension were in Changting County (83.6), Xishui County (78.1), and Shouguang City (77.1). Finally, the experimental areas with the highest overall ASPC scale scores were Changting County (84.0), Xishui County (76.9), and Shouguang City (76.5), as shown in Table 2.

Comparison of ASPC scale scores for patients with different characteristics

(1) "First-contact" care dimension: The scores for the "first-contact" care dimension did not differ significantly across gender or marital status ($P>0.05$). However, significant differences were observed based on age, educational level, employment status, family doctor enrollment, and self-reported chronic conditions ($P< 0.05$).
(2) Service accessibility dimension: There was no significant difference in the scores for the service accessibility dimension between patients of different genders or marital statuses ($P > 0.05$). In contrast, significant differences were found for age, educational level, employment status, family doctor enrollment, and self-reported chronic conditions ($P < 0.05$).
(3) Continuity of doctor-patient relationship dimension: No significant differences were observed in the scores for this dimension based on gender, marital status, educational level, or employment status ($P>0.05$). However, significant differences were found in relation to

Table 3
Scores of ASPC scale of the general practice in the surveyed patients by different characters in the national comprehensive primary health care pilot zones in 2023.

Feature	Cases	First consultation/ primary care (Mean±SD)	Service accessibility (Mean±SD)	Doctor-patient relationship continuity (Mean±SD)	Comprehensive service (Mean±SD)	Coordinated service (Mean±SD)	Total score (Mean±SD)
Male	504	69.7±20.1	73.9±20.1	71.6±21.1	73.9±21.3	68.3±21.8	71.5±17.4
Female	653	69.4±20.8	74.3±20.1	72.3±20.3	76.0±20.7	68.7±21.6	72.1±17.2
F		0.048	0.096	0.346	2.772	0.125	0.426
P		0.826	0.756	0.557	0.096	0.724	0.514
Age							
<60 year	783	67.5±20.6	72.6±20.4	70.6±20.3	73.7±21.4	68.3±21.3	70.5±17.7
≥60 year	374	73.7±19.8	77.3±18.9	74.9±21.2	78.07±19.9	69.0±22.4	74.6±16.1
F		23.569	14.048	11.001	11.166	0.267	14.079
P		<0.001	<0.001	0.001	0.001	0.605	<0.001
Marital status							
Unmarried	91	65.8±19.6	72.3±20.6	68.6±20.7	73.5±23.2	68.9±22.1	69.8±18.3
Married	1001	69.7±20.5	74.1±20.2	72.3±20.6	75.1±20.7	68.5±21.4	71.9±17.3
Divorced/widowed	65	72.0±21.6	76.5±17.7	72.4±21.3	77.6±22.3	68.6±26.0	73.4±15.7
F		2.02	0.866	1.326	0.727	0.014	0.913
P		0.133	0.421	0.266	0.484	0.986	0.402
Education level							
Junior high school and below	703	71.5±20.1	75.2±19.8	72.6±21.3	75.8±20.7	68.5±22.1	72.7±17.0
High school/technical school	190	66.6±20.7	71.1±20.3	70.2±20.1	72.1±21.3	65.9±20.6	69.2±17.3
College and above	264	66.3±21.0	73.4±20.4	71.6±19.1	75.5±21.5	70.4±21.4	71.4±18.0
F		8.626	3.415	1.113	2.385	2.317	3.269
P		<0.001	0.033	0.329	0.093	0.099	0.038
Employment status							
Employed	556	68.1±20.6	72.8±20.5	71.4±20.4	74.2±21.5	68.7±21.3	71.0±17.9
Retired	114	71.9±19.3	77.7±18.4	72.1±20.7	77.6±19.6	69.1±20.5	73.7±15.0
Unemployed	33	59.89±21.7	64.2±25.7	64.2±26.0	65.0±24.0	58.1±22.5	62.23±21.2
None	424	71.3±20.6	75.5±19.2	73.4±20.6	76.3±20.3	68.8±22.4	73.1±16.6
Student	30	72.1±18.1	75.8±18.5	71.9±19.1	76.3±19.0	70.0±22.1	73.2±15.5
F		3.921	4.144	1.816	2.993	1.979	3.793
P value		0.004	0.002	0.123	0.018	0.095	0.005
Family doctor contracted service							
Not contracted	366	64.7±21.3	69.9±20.2	64.1±21.0	69.5±21.9	61.9±21.4	66.0±17.0
Contracted	791	71.8±19.8	76.1±19.7	75.7±19.4	77.8±20.0	71.6±21.2	74.6±16.8
F		30.443	24.315	83.641	41.612	51.743	64.874
P		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Self-reported chronic conditions							
No	811	68.0±20.9	73.2±20.5	70.4±20.9	73.5±21.6	67.5±21.9	70.5±17.9
Yes	346	73.1±19.0	76.1±18.8	75.7±19.6	78.9±18.9	70.9±21.0	74.9±15.5
F		15.113	4.97	16.258	16.053	5.944	15.935
P		<0.001	0.026	<0.001	<0.001	0.015	<0.001

age, family doctor enrollment, and self-reported chronic conditions ($P< 0.05$).

(4) Comprehensive services dimension: The scores for the comprehensive services dimension did not show significant differences based on gender, marital status, or educational level ($P>0.05$). However, significant differences were noted for age, employment status, family doctor enrollment, and self-reported chronic conditions ($P<0.05$).
(5) Coordinated services dimension: No significant differences were found in the scores for coordinated services across gender, age, marital status, educational level, or employment status ($P>0.05$). In contrast, significant differences were observed between patients based on their family doctor enrollment and self-reported chronic conditions ($P< 0.05$).
(6) ASPC scale total score: The total ASPC scale scores did not differ significantly across gender or marital status ($P>0.05$). However, significant differences were observed based on age, educational level, employment status, family doctor enrollment, and self-reported chronic conditions ($P< 0.05$), as shown in Table 3.

Multivariate linear regression analysis of factors influencing ASPC scale scores

Multivariate linear regression analysis was performed with the scores from the five dimensions of the ASPC scale, as well as the total ASPC scale score, as dependent variables (converted to a 100-point scale). Independent variables included age, educational level, employment status, family doctor enrollment, self-reported chronic conditions, and pilot zone. The results indicated that age, employment status, family doctor enrollment, and pilot zone were significant factors influencing the scores for the "first-contact" care dimension ($P<0.05$). Additionally, employment status, family doctor enrollment, and pilot zone were significant factors influencing the scores for the remaining four dimensions, as well as the total ASPC scale score ($P<0.05$).

Specifically, after adjusting for other factors, patients aged 60 years and above scored higher on the "first-contact" care dimension compared to those under 60 ($P<0.05$). Unemployed patients had lower scores across all five dimensions and the total ASPC scale score compared to employed patients ($P<0.05$). Patients who had signed a family doctor scored higher across all dimensions and the total ASPC scale score compared to those who had not signed a family doctor ($P<0.05$). Patients from Changting County and Xishui County had higher total ASPC scale scores than those from Jiexiu City ($P<0.05$), while those from Haiyan County, Luxian County, and Dongfang City had lower total ASPC scale scores than those from Jiexiu City ($P<0.05$). No significant differences were found in the total ASPC scale scores among patients from Suixi County, Shouguang City, Jia County, Xinyuan County, Miyun District, Shangsi County, and Jiexiu City ($P>0.05$), as shown in Table 4.

Discussion

The ASPC scale scores reflect the current status of primary care services in China

The 2008 World Health Organization (WHO) World Health Report highlighted that the key functions of primary care include "first-contact" care, continuity of service, comprehensiveness, coordination,

Table 4
Multivariate analysis of the scores of ASPC scale of general practice of the surveyed patients in 2023.

Factor	First consultation/primary care ($\bar{x}\pm s$)	Service accessibility ($\bar{x}\pm s$)	Doctor-patient relationship continuity ($\bar{x}\pm s$)	Comprehensive service ($\bar{x}\pm s$)	Coordinated service ($\bar{x}\pm s$)	Total score ($\bar{x}\pm s$)
Constant	63.026 (57.331–68.722) [a]	66.745 (61.268–72.222) [a]	65.550 (59.975–71.125) [a]	68.404 (62.567–74.241) [a]	63.893 (58.074–69.713) [a]	65.524 (60.868–70.180) [a]
Age (Reference: <60 years)						
≥60 years	3.358[a]	2.549	2.741	2.044	0.565	2.251
Education Level (Reference: below junior high school)						
High school/technical school	-2.746	-1.986	-0.695	-1.429	-1.360	-1.643
College and above	-3.117	0.584	-0.122	1.364	0.978	-0.063
Employment status (Reference: employed)						
Retired	-1.629	3.062	-0.474	1.485	1.204	0.730
Unemployed	-9.429[a]	-7.558[a]	-7.583[a]	-9.563[a]	-9.446[a]	-8.716[a]
None	-1.795	0.824	-0.449	0.111	0.572	-0.147
Student	4.320	3.137	1.797	3.400	1.630	2.857
Family doctor contracted service (Reference: not enrolled)						
Contracted	7.263[a]	6.694[a]	8.476[a]	6.550[a]	8.013[a]	7.399[a]
Self-reported chronic conditions (Reference: no)						
Yes	1.408	-0.547	1.350	2.633	1.709	1.311
Pilot (Reference:Jiexian City)						
Haiyan County	-4.927	-7.590[a]	-9.885[a]	-9.000[a]	-8.804[a]	-8.041[a]
Suixi County	-1.589	-2.835	-4.796	-6.285[a]	-2.268	-3.554
Changting County	5.753[a]	12.745[a]	8.927[a]	6.287[a]	11.687[a]	9.080[a]
Shouguang City	-0.253	1.596	2.386	3.043	5.309	2.416
Jia County	-1.354	-5.031	3.522	0.432	-10.571[a]	-2.600
Lu County	-11.964[a]	-12.651[a]	-8.598[a]	-8.062[a]	-14.011[a]	-11.057[a]
Xinyuan County	-2.078	-3.740	-7.829[a]	-3.127	-4.595	-4.274
Miyun District	-2.135	-0.381	-1.970	2.339	2.761	0.123
Shangsi County	6.664[a]	6.488[a]	-11.152[a]	0.888	-7.908[a]	-1.004
Dongfang City	-9.034[a]	-6.239[a]	-8.971[a]	-10.899[a]	-8.647[a]	-8.758[a]
Dongfang City	2.188	5.583[a]	3.411	4.545	8.884[a]	4.922[a]

Note: [a]indicates $p < 0.05$.

and a focus on family-centered, community-oriented care.[4] The internationally recognized core features of primary care, namely first-contact care, accessibility, continuity, comprehensiveness, and coordination, have been widely adopted in evaluating the performance of primary care facilities and the capabilities of family doctor services in China.[5-7]

The five dimensions of the ASPC scale used in this study closely align with these core elements. The scale was developed using rigorous, scientifically sound methods, with adjustments made by the research team based on an extensive review of the literature. The questionnaire demonstrated good reliability and validity. Patients, as both participants and recipients of healthcare services, provide one of the most direct perspectives on the quality of medical care, apart from healthcare providers. Their evaluations offer valuable and detailed feedback on healthcare quality. The ASPC scale, which is based on patients' experiences, effectively reflects the current status of primary care services in China.

Family doctor contracted services as an important factor for improving the patient experience at primary care facilities

Family doctor contracted services are a healthcare model characterized by fundamental, comprehensive, continuous, accessible, and coordinated features.[8] According to the ASPC scale scores across its five dimensions and the total score, patients in the pilot zones who had signed a family doctor scored higher than those who had not. The multivariate linear regression analysis, after adjusting for other confounding factors, revealed that family doctor contracted services are a significant factor influencing the ASPC scale scores. This result aligns with the conclusions of studies by Wang Xin et al.[9-10] and Yang Jinhong et al.,[11] which suggests that family doctor contracted services contribute to improving the experience of patients visiting primary care facilities.

By signing a family doctor contract, patients' experiences of primary care core functions were enhanced. This improvement was evident in aspects such as "first-contact" care, service accessibility, continuity of the doctor-patient relationship, comprehensiveness, and coordination of services. Currently, China's family doctor contract services focus on strengthening the connection between family doctors and contracted residents. These services offer integrated care, including medical treatment, prevention, rehabilitation, and health promotion. They also provide referral pathways for contracted patients through green channels. Such initiatives have increased patients' attachment to their family doctors, thereby improving the continuity of the doctor-patient relationship. The establishment of a contractual relationship has also strengthened service accessibility. Furthermore, services such as health consultations, medication guidance, and chronic disease management have enhanced service comprehensiveness. These measures have strengthened the relationship between patients and primary care facilities, playing a key role in encouraging residents to seek care at primary care facilities.

The impact of demographic factors on the patient experience at primary care facilities

Among various demographic factors, only age and employment status were found to influence the ASPC scale scores for patients seeking care at primary care facilities. After controlling for other confounding factors, patients aged 60 and above scored higher than those under 60 on the "first-contact" care dimension. This suggests that elderly patients tend to rate first-contact care more positively. One possible explanation is that elderly patients, who often require regular medication or follow-up visits, are more likely to choose nearby, low-cost primary care facilities, facilitating continuous health management and follow-up care.

In contrast, after controlling for other confounding factors, unemployed patients scored lower across all dimensions and the total score compared to employed patients. The China National Report on Mental Health Development (2019–2020)[12] found that depression levels were highest among the unemployed, retired, or inactive populations. Whether the mental health challenges faced by unemployed individuals affect their primary care experience requires further investigation.

Differences in patient experience scores at primary care facilities across different pilot zones

The comprehensive reforms and innovative approaches at primary care facilities across the pilot zones vary, with each area focusing on different aspects. In Changting County, the primary health care reform has driven continuous improvements in the capabilities of healthcare institutions. Family doctor contracted services and integrated medical and elderly care services were implemented in recent years. By leveraging family doctor contracted services, the county has adopted a "prevention-screening-diagnosis-treatment-management" model to offer classified and categorized management for chronic disease patients, such as those with hypertension and diabetes.

Residents' healthcare experiences was improved by optimizing the layout of primary care facilities and enhancing their capabilities in Xishui County. Significant progress has been made in the informatization of primary care facilities in Shouguang City, implementing "management of hypertension, diabtetes, and dislipidemia; prevention of coronary heart disease, stroke, kidney disease, fundus disease, peripheral neuropathy, and peripheral vascular disease", and promoting rural integrated management. Jiaxian County was the first in the country to launch the "Health Cloud Mobile Clinic," which provides healthcare services directly to village clinics. The test results are then sent to residents' mobile phones, greatly improving accessibility. Jiexiu City has focused on reshaping the county-level healthcare service system, introducing a series of initiatives to ensure that "patients do not need to travel, while experts, medical resources, management, and information remain mobile," covering the entire life cycle and health process.

These pilot zones recorded relatively high total patient experience scores: Changting County (84.0), Xishui County (76.9), Shouguang City (76.5), Jiaxian County (73.7), and Jiexiu City (73.4). In contrast, Haiyan County and Suixi County, which rank highly in primary care facilities evaluations due to Haiyan's innovation in fiscal subsidy mechanisms and Suixi's breakthroughs in capitation payment and "chronic disease package" payment (42 types of chronic diseases are included), had lower patient experience scores: Haiyan County (65.6) and Suixi County.

These findings suggest that all pilot zones should continue to improve and focus on patient-centered approaches and convenience measures.

Limitations of the study

Government-led patient experience evaluations in healthcare services, implemented by third parties, are currently the mainstream model for such assessments internationally.[13] This survey was organized by local health authorities and conducted by healthcare staff from local primary care facilities, who were not third-party evaluators in the strict sense. This may impact the research results. However, the Health Development Research Center instructed that investigators be selected from all primary care facilities within the respective counties (cities/districts) and explicitly advised them not to participate in surveys within their own facilities, thus minimizing potential bias from their affiliations. Due to the constraints of the questionnaire content, it was difficult to pinpoint the specific effects of various primary health care reform measures on patient experience scores in the different pilot zones, future research should focus on improving the analysis of this aspect.

Authors' contributions

Conceptualization, Q.J.; Methodology, L.C., Z.Y., Z.L. and Q.J.; Data curation, L.C. and L.S.; Formal analysis, L.C. and L.S.; Funding acquisition, Q.J.; Investigation, L.C., Z.Y., Z.L.; Methodology, Q.J., L.C., Project administration, Q.J., Z.Y., Z.L.; Resources, L.C., Z.Y., Z.L; Supervision, Q.J.; Validation, Q.J.; Writing—original draft, L.C.;4;review and editing, L.S. All authors have read and agreed to the published version of the manuscript.

Authors' other information

Not applicable.

Ethical approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

Not applicable.

Funding

Not applicable.

Declaration of competing interest

Q.J. is the editor of Chinese General Practice Journal, she is not envolved in the editorial review or the decision to publish this article. All authors declare that there are no competing interests.

Acknowledgements

Not applicable.

References

1. Doyle C, Lennox L, Bell D. A systematic review of evidence on the links between patient experience and clinical safety and effectiveness. *BMJ Open*. 2013;3(1):e001570. doi:10.1136/bmjopen-2012-001570.
2. Li L, Kuang L, Zhong CW. Development of the Chinese version of the core features and functions of primary care patient experience scale. (Chinese). *Chin Gen Pract*. 2021;24(13):1629–1636. doi:10.12114/j.issn.1007-9572.2020.00.497.
3. Kuang L, Li L, Luo ZJ, et al. Development and validation of the Chinese version of the core features and functions of primary care patient experience scale. (Chinese). *Chin Gen Pract*. 2021;24(13):1621–1628 1643. doi:10.12114/j.issn.1007-9572.2020.00.496.
4. Zhao R. *The World Health Report 2008: Primary health Care—Now More Important Than ever. (Chinese)*. Beijing: People's Medical Publishing House; 2008.
5. WONCA Europe. *The European definition of General Practice/Family Medicine*. Barcelona: WONCA Europe; 2002.
6. Peng YC, Wang Y, Chang WH, et al. Study on the quality evaluation index system for general practice. (Chinese). *Chin Gen Pract*. 2004;7(3):158–160. doi:10.3969/j.issn.1007-9572.2004.03.010.
7. Luo XL, Huang YL, Hao J, et al. Research on the construction of an evaluation index system for family doctor team contracted service capacity. (Chinese). *Chin Gen Pract*. 2019;22(13):1554–1558. doi:10.12114/j.issn.1007-9572.2019.00.216.
8. Wang F. Family doctor contracted services: Opening the path for high-quality development. (Chinese). *China Health*. 2022(5):66–68. doi:10.15973/j.cnki.cn11-3708/d.2022.05.024.
9. Wang X, Zhang YC, Qin JM, et al. Impact of family doctor contracted services on the core characteristics of general practice in Ningbo City. (Chinese). *Soft Sci Health*. 2023;37(4):51–55. doi:10.3969/j.issn.1003-2800.2023.04.013.
10. Wang X, Zhang YC, Qin JM, et al. Impact of core characteristics of general practice on patient satisfaction with visits under the family doctor contracted service model: A case study of J County in Henan Province. (Chinese). *Chin Prim Health Care*. 2023;37(1):22–25. doi:10.3969/j.issn.1001-568X.2023.01.0007.
11. Yang JH, Zhou MP, Liang CY, et al. Impact of family doctor contracted services on the core characteristics of general practice in urbanized areas of the Pearl River Delta. (Chinese). *Chin J Soc Med*. 2021;38(4):441–445.
12. Fu XL, Zhang K, Chen XF, et al. *The National Mental Health Development Report of China (2019-2020). (Chinese)*. Beijing: Social Sciences Academic Press; 2021.
13. Hu GY, Liu YL. Concept and evaluation practice of patient experience in medical services. (Chinese). *Chin J Health Pol*. 2019;12(3):24–31. doi:10.3969/j.issn.1674-2982.2019.03.004.