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RESEARCH

The impact of perceived value, customer expectations, and patient experience on the satisfaction of contracted patients in hospitals

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Abstract

Background There is a growing focus on researching healthcare services to identify factors associated with satisfaction in family contract services in China. However, previous satisfaction studies have mainly focused on the primary healthcare. Currently, the primary healthcare service capacity in China is relatively insufficient, necessitating the involvement of upper-level hospitals in contracted services Thus, the study significantly deepens and broadens previous research on satisfaction in family contract services of hospital.

Methods A conceptual model was developed and tested on a sample of customers and patients with hospital contract service ($n = 624$). Partial least-squares structural equation modelling (PLS-SEM) was used to analyse the data with SmartPLS4.0 software in two steps involving a measurement model and a structural model. Mediation analysis was used to test the proposed indirect effects.

Results Contracted patient satisfaction is directly and positively associated with Perceived value ($\beta = 0.223$), Patient experience ($\beta = 0.613$) and Customer expectations ($\beta = 0.129$). The relationships between Customer expectations, Patient experience and contracted patient satisfaction are all mediated by Perceived value. Patient experience mediates the relationship between Customer expectations and contracted patient satisfaction. Overall, the proposed model explains 61.3% of the variance in customers and patients with hospital contract service' satisfaction.

Conclusions This study reveals a complex pattern of links between satisfaction and Customer expectations, Perceived value and Patient experience. However, the findings indicate that Customer expectations has an influential and multifaceted impact on satisfaction of customers and patients with hospital contract service satisfaction.

Keywords Family doctor contract service, Perceived value, Patient experience, Structural equation model

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Introduction

There is a growing focus on researching healthcare services to identify factors associated with satisfaction in family contract services in China [1, 2]. However, previous satisfaction studies have mainly focused on the primary level [3, 4]. Currently, the primary-level health service capacity in China is relatively insufficient, necessitating the involvement of upper-level hospitals in contracted services [5, 6]. In reality, the interactive operating mechanism between upper-level hospitals and primary-level hospitals is "fragmented," and the collaborative operating mechanism of family doctor contract services is incomplete, hindering the rapid development of contracted services.

In 2023, the National Health Commission of China and the National Administration of Traditional Chinese Medicine issued the "Notice on Carrying Out Activities to Improve Medical Experience and Enhance Patient Experience", once again shifting the focus of medical and health service evaluation to the patient perspective, which highlight the service concept of "patient-centered." Therefore, how to combine the customer perceived value theory and its measurement with actual situations at the specific level has become a new research direction.

How does patient satisfaction affect their intention to sign contracts services offered by hospitals? Thus, satisfaction, as a crucial outcome indicator, requires more substantial and in-depth analysis.

Literature review and theory foundation

Literature review of satisfaction healthcare contract services

Many scholars in the field of health management have conducted various studies in the medical field based on satisfaction index models, including research on the satisfaction of medical institution customers, the satisfaction of medical service customers, and the satisfaction of medical insurance participants [7]. These studies have yielded numerous theoretically and practically significant research findings, providing a reference for subsequent research. Currently, in the medical field, the theory of customer satisfaction is mostly applied in the study of hospital customer satisfaction [8]. From the framework and indicator connotations of satisfaction itself, studies on the satisfaction of family doctor services initially emerged in the UK [9–11], and then countries such as the United States, Australia, and Canada conducted systematic reviews and large-scale mature surveys on the satisfaction of family doctor services. In the UK at the national level [12], the General Practitioner Service Patient Survey is also a large-scale national survey funded by the NHS, primarily covering eight dimensions: local general practitioner services, appointment services, the last appointment, overall experience, health status, when the general practice clinic is closed, dental services, and demographic and sociological information. The results indicated that 83.8% of patients were satisfied with the overall service. Additionally, there are 55 items in the National Primary Care Trust Patient Survey in the UK that encompass all aspects of general practitioners' services. The Patient Participation Program [13] (PPP) is a patient satisfaction survey recognized by the Royal Australian College of General Practitioners, aiming to assist general practitioners in continuously enhancing quality. From 1994 to 2003, a total of 3,500 doctors and more than 1 million patients participated in this survey. Logistic generalized estimating equations were utilized to analyse the data, revealing that Australians are highly satisfied with general practice (99%), and patients who are male, older, did not participate in the relevant survey, or had a smaller survey size tend to be more satisfied. Moll van Charante E et al. (2006) conducted a national survey in the Netherlands [11], mailing a survey to 14,400 patients, and developed a patient satisfaction questionnaire for general practitioner services, mainly including four indicators: telephone nurses, doctors, organizations, and follow-ups. Ludmila Marcinowicz et al. (2009) [8] conducted in-depth interviews with 36 patients in Polish clinics and utilized qualitative methods to explore how to understand satisfaction from the perspective of patients receiving family doctor services, proposing six core characteristics of satisfaction. They suggested that since patients' understanding of satisfaction varies, the focus of the assessment should be on the composition of satisfaction rather than satisfaction itself. There is relatively less satisfaction with the contracted services of large hospitals. From the perspective of combining satisfaction with the corresponding theoretical framework, Hu Cuiling (2020) [14, 15] explored the establishment of a practical family doctor contracted service resident satisfaction index model, employing SEM to obtain the path coefficients and their effect values between the latent variables; the importance-satisfaction matrix method was utilized to analyse the measurement indicators of the quality perception dimension. Mai Thi Thuy My et al. (2017) [16] utilized convenient sampling to survey 250 patients aged 18 and above in family doctor clinics in Ho Chi Minh City, Vietnam, and discovered that perceived quality and reputation are factors influencing patient satisfaction, and by affecting satisfaction, they further affect loyalty. Among them, perceived management quality is the strongest predictor.

Rao *et al. BMC Health Services Research* (2025) 25:7

Page 3 of 16

Generally, although different studies have investigated the association between the satisfaction of family doctors with contracted services and the utilization of contracted services by family doctors and analysed the specific influencing factors of satisfaction and service utilization under different practical backgrounds, the main focus of the research has been on the influencing factors themselves. For the connotation relationship of the influence of satisfaction factors on service utilization and continuous contracted utilization need deeply and formed path correlation analysis.

Theory foundation of satisfaction and implication of contracted service between hospitals and patients

*Perceived value theory

Perceived value theory [16] is central to understanding consumer decisions, focusing on how consumers evaluate the worth of products or services. Valarie A. Zeithaml pioneered the concept, defining it as a comprehensive assessment of gains versus costs, and emphasizing its individualized and dynamic nature. Zeithaml's model includes product characteristics and higher-level concepts, significantly influencing marketing and consumer behavior studies. Later study keeps broadening the measurement approach. This comprehensive framework has been applied across various industries, enhancing consumer re-engagement. In healthcare, the theory is adapted to consider the unique aspects of medical services, focusing on patient perceptions of quality, efficiency, safety, and satisfaction. It aids healthcare providers in aligning services with patient expectations, improving communication, and shaping healthcare policies to ensure patient well-being and resource optimization.Family doctor contract service is a comprehensive medical and health service. For the current family doctor contract service in China, the utilization rate of the contract is not as expected. Whether it can reflect the logic embodied by the perceived value theory needs to be further refined based on the perceived value theory to extract the conceptual model of this study.

*Customer satisfaction theory

Professor Claes Fornell and his team proposed the American Customer Satisfaction Index model (ACSI), which was developed based on the Swedish Customer Satisfaction Barometer (SCSB). In the ACSI model, customer satisfaction is the core, affected by customer expectations, perceived quality, and perceived value, and affects customer complaints and loyalty. Customer expectations are measured by three indicators: overall expectations, reliability expectations, and the degree of needs satisfaction. Perceived quality is the customer's evaluation of the recently consumed product or service, including customization and reliability. Perceived value is measured by two indicators: price perception under given quality and quality perception under given price. Customer satisfaction is assessed by three indicators: overall satisfaction, the gap with the ideal, and the fulfillment of expectations, belonging to cumulative customer satisfaction.

*Service Quality Evaluation Model (SERVQUAL)

The SERVQUAL model is a multi-dimensional tool for evaluating service quality, proposed by Parasuraman and Zeithaml. The core of the model is the service quality gap model, which means that service quality depends on the difference between user expectations and perceptions. It measures through five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. The SERVQUAL model uses questionnaire surveys to let customers score items under each dimension and assess service quality by calculating the gap between expected values and actual perceptions. The model helps service providers understand customer expectations and perceptions and provides directions and basis for improvement. In medical and health services, due to its operability and dimension compatibility, the SERVQUAL model has been widely applied and is being used in recent years in the practice and research of medical and health services, especially in services with close doctor-patient relationships.

*Integrated model construction of residents' satisfaction with family doctor contract service in large hospitals

Evaluating medical services from patient's 'perceived quality' may be biased, while 'patient experience' is easier to measure.The study combines theories to formulate a model with eight variables: satisfaction, perceived value, expectations, patient experience, and five service quality dimensions. It swaps 'perceived quality' for 'patient experience' to address healthcare challenges. The model excludes 'customer complaints' and 'loyalty' to focus on service utilization.Patient satisfaction hinges on meeting expectations, amplified by perceived value and overall patient experience. Healthcare professionals' empathy and communication drive satisfaction. Providers can improve services, communication, and care quality to enhance patient experience. This is crucial in family doctor services.Understanding satisfaction mechanisms in contracted hospital services is vital for China's healthcare system progress and efficient health service use.

This paper is structured as follows: First, the conceptual model is briefly described. Second, the content and links between the concepts are discussed. Third, the methods, statistical analysis, and results of the empirical hypothesis tests are presented. The paper concludes with a discussion of the findings and recommendations for further research. The final section also includes an overall conclusion from this study.

Conceptual Model of the Study: Fig. 1 illustrates the conceptual model. As noted in the introduction, the overall aim of this study is to contribute to research on contracted patient satisfaction in healthcare settings, integrated modelling by the combined theory of the American customer satisfaction theory model (ACSI scale) [17, 18], the service quality evaluation model (SERVQUAL scale) [19, 20], and the Chinese customer satisfaction theory model (CCSI theory) [21, 22]. Modelling was conducted as shown in Fig 1 and Table 1.

Patient satisfaction

From the Anderson Health Services Utilization Model [23, 24], satisfaction is as an outcome variable will further influence patients' behavioral choices, we draw the hypothesis: patient satisfaction positively affects patient behavioral intentions of family doctor contracted service.

In the study context, satisfaction refers to the customer satisfaction of family doctor contracted service users in hospitals and refers to the satisfaction degree of family

Table 1 Hypotheses leading this study

Hypotheses Hypothesized relationships
H1PC is positively related to CPS
H2CE is negatively related to PC
H3CE is negatively related to CPS
H4The relationship between CE and CPS is mediated by PC
H5PE is positively related to CPS
H6PE is positively related to PC
H7The relationship between PE and CPS is mediated by PC
H8CE is not related to PE
H9Tangibility is positively related to PE
H10Reliability is positively related to PE
H11Responsiveness is positively related to PE
H12Empathy is positively related to PE
H13Continuity is positively related to PE

CPSis Contracted patient satisfaction, *PCis* Perceived value, *CEis* Customer expectations, *PEis* Patient experience

doctor contracted service residents with the family doctor contracted service they experience [25, 26]. The ACSI customer satisfaction dimension and the actual situation of family doctor contract service are based on the mature scales used in previous studies. According to the expected confirmation model (CCSI), both Bhattacherjee (2010) and subsequent studies have confirmed that satisfaction is the factor that determines the continuous use intention of contracted family doctor service users in
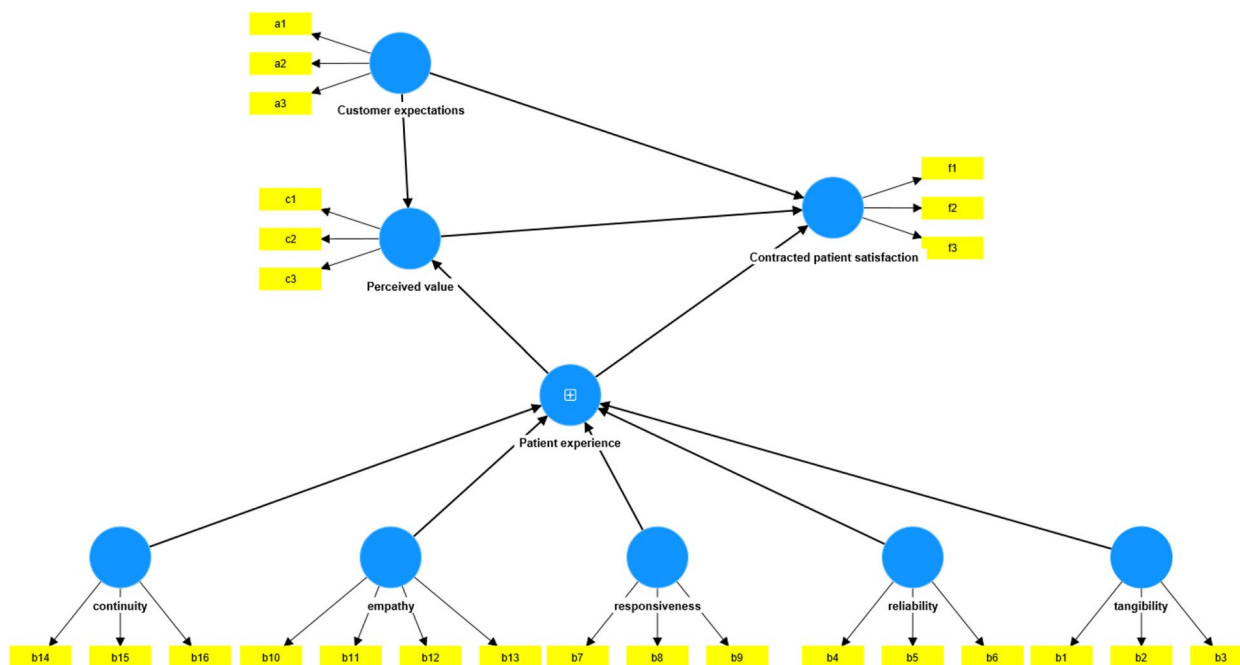

Fig. 1 Conceptual model to analyse the impact of perceived value, patient experience and customer expectations on patient satisfaction with the contracted hospital service

hospitals. The more satisfied the family doctor contract service users of the family doctor contract service experience and experience evaluation are, the stronger their intention to continue to use the contracted service will be, so the following assumptions are proposed:

Perceived value

Perceived value [27] refers to the evaluation of the overall utility of a product (or service) on the basis of its "gain and pay" balance. In this study,perceived value refers to the perceived usefulness of contracted services by contracted users to maintain improved health. Perceived value can affect not only the first adoption of contracted service users of family doctors in hospitals but also the satisfaction and continuous use intention of contracted service users of family doctors in hospitals.

Based on this, the study makes the following assumptions:

> H1:PC is positively related to CPS

Perceived value in this study includes the following measures: according to the quality of the contracted service, you are satisfied with the personal cost; compared with the personal cost, you are satisfied with the quality of the contracted service, and the contracted service meets your expectations.

Customer expectations

Customer Expectations [28, 29] refers to the confirmation degree evaluation made by family doctor contract service users after use. According to the expected confirmation model, expected confirmation directly affects the perceived value of the hospital family doctor signing service user and the key factors of satisfaction. The more users of the hospital's family doctor signing service expect to receive confirmation, the higher their satisfaction with the service will be, and they will find the service more useful. Therefore, the following assumptions are proposed:

> H2:CE is negatively related to PC.
> H3: CE is negatively related to CPS.
> H4: The relationship between CE and CPS is mediated by PC.

In this context, customer expectation refers to an expectation of residents' family doctor contract services based on prior personal experience before receiving family doctor contract services.

Customers expect to include the following measures in this study: before signing, you expect to receive help from the contracted family doctor team when you have

needed, before signing, you expect to sign the family doctor team, and before signing the contracted family doctor service to be three reliable indicators.

Patient experience

Patient experience [30, 31] refers to the actual feelings of residents at or after receiving contracted family doctor services. With respect to the ACSI quality perception dimension, the SERVQUAL model, the connotation of the family doctor contract service and its actual situation were constructed. Due to the particularity of the medical industry (including the complexity of medical activities, the evaluation of medical results, the information asymmetry between doctors and patients, etc.), the quality perception and main patient experience in medical services are more directly reflected.

> H5:PE is positively related to CPS.
> H6:PE is positively related to PC.
> H7:The relationship between PE and CPS is mediated by PC.
> H8:CE is not related to PE.

Patient experience refers to all aspects that patients experience during the whole medical process, including the interaction with the medical team, the comfort of the medical environment, the clarity of information communication, and the feeling of the treatment process. It focuses not only on patient satisfaction but also on a wider range of feelings and experiences. Patient expectations are the expectation and hope of the service before receiving the medical service. Patients may have specific expectations for medical outcomes, medical processes, attitudes of healthcare providers, etc. However, the need to follow medical service norms and quality safety makes the patient experience different from satisfaction and expectations. Medical service norms and quality safety are important principles for ensuring that patients have access to appropriate, safe and effective treatment. These norms may include standard procedures for diagnosis and treatment, cleaning and safety of medical facilities, qualification and training of healthcare personnel, etc. The importance of following medical service standards and quality and safety lies in ensuring the health of patients: ensuring the quality and safety of medical services is the primary task, which is directly related to the treatment effect and health status of patients. Building trust: Patients' trust in healthcare institutions depends largely on whether they see services as standard and safe. Avoiding risks and errors: Following norms can reduce medical errors and risks and improve the success rate of treatment. Maintaining professional standards: The medical industry has its own professional norms and

standards, and following these standards helps to maintain its professionalism and reputation. For example, even if patients are satisfied with the attitudes of healthcare workers, medical services that do not follow appropriate norms may affect treatment effectiveness and thus the overall patient experience. Similarly, patients' expectations may be beyond those actually available, and the regulation and quality and safety of medical services must be given priority. In practice, medical institutions need to always follow medical service norms and quality and safety requirements while meeting patient expectations and providing a good patient experience. This means balancing the needs of patients with medical expertise and providing high-quality, safe and patient-satisfying services. Care providers should communicate effectively with patients to understand the basis and limitations of treatment to adjust their expectations and optimize the patient experience where possible. Patient experience was included in the present study: service portability and service reliability. There are five primary latent variable indicators: service responsiveness, service empathy and service continuity. The measurements of each latent variable are described later, with the following assumptions:

> H9:Tangibility is positively related to PE.
> H10: Reliability is positively related to PE.
> H11: Responsiveness is positively related to PE.
> H12: Empathy is positively related to PE.
> H13: Continuity is positively related to PE.

Service tangibility
In this study, situation refers to the external performance of family doctor contracted services, including environmental sanitation, facilities, etc. The following measurement indicators were used: your comfort with the clinical environment, the fluency of service during the whole process of medical treatment, and the reasonable arrangement of each medical item.

Service reliability
In this study, context refers to the ability to fulfil the service commitment to the contracted residents, that is, the services provided by the family doctor are effective for the contracted residents, who regard the skill level and expertise of the family doctor as reliable. The indicators included family doctor service ability, service effectiveness, etc. Service reliability was included in this study: the professional skill level of doctors, the service time of family doctors, and the improvement or control of chronic diseases.

Service responsiveness
In the context of this study, service responsiveness refers to the ability of the family doctor service team to be willing and quickly provide services and specifically refers to the subjective intention and psychological state reflected in providing services to contracted residents, including waiting time and service timeliness. Service responsiveness was included in this study as the following measures: your waiting time, the doctor's patient and meticulous explanation of the condition, and the timeliness of contacting your family doctor.

Service empathy
Enterprises and service personnel can put themselves in the shoes of customers and strive to meet the requirements of customers. This requires the service personnel to have a spirit of input, think what the customer thinks, urgent customer needs, understand the actual needs of customers, and even special needs, do everything possible to meet, give customers full care and corresponding consideration so that the service process is full of human kindness, which is the embodiment of empathy. Empathy has the following characteristics: the ability to approach customers, sensitivity, and the ability to effectively understand customer needs. In the context of this study, service empathy refers to the personalized needs of contracted residents; that is, family doctors can flexibly use their professional knowledge and skills, provide differentiated and personalized services to different contracted residents, and pay attention to the interests of contracted residents.

In this study, perceived interactivity was used to measure the interactive system design characteristics of family doctor contracted services from the perceived level of family doctor contracted service users in hospitals, and it was used as an external variable influencing the perceived value and perceived ease of use in the TAM. Therefore, the present study makes the following assumptions. In this study, the following measures are used: the active care of the family doctor team, the service attitude of the medical team and the service staff, the convenience of the contracted family doctor, and the provision of personalized medical services.

Service continuity
In this study, service continuity refers to ensuring the completeness of subsequent results when providing services. Service continuity in this study included the following three indicators: the establishment of perfect electronic health records, the provision of regular

physical examination services, and the provision of continuous health management.

Methods

The focus of this paper is on the contracted patient satisfaction of customers and patients with hospital contract services. After adjusting the initial questionnaire combined with the results of the presurvey, the author designed the final web survey questionnaire through the Questionnaire Star (http://www.sojump.com/). The final questionnaire was mainly delivered to the users of the family doctor contract service in the form of group text messages through the enterprise information service platform (https://sc.ums86.com/index. Jsp), and a total of 624 valid responses were received with the coordination and help of the User Experience Department of the Family Doctor Contract Service in hospitals.

Table 2 provides information on the personal characteristics of the participants. The participants were customers and patients with hospital contract services at West China Hospital.

Questionnaire is based on the literature and the hospitals' own situation attend as supplementary file < Satisfaction Questionnaire for Contract Service > and Constructs used in this study was draw as Table 3

Data analysis

Partial least-squares structural equation modelling (PLS-SEM) [32–35] was used to test the conceptual models and hypothesized relationships using SmartPLS4.0 software. The first step in evaluating the PLS-SEM results was to assess a set of criteria for the reflective measurement model, and the second step involved evaluating the structural model. Next, the hypothesized mediating effects were estimated and analysed. Following the recommended steps of Hair [36] et al., the quality of the measurement model results and the structural model results could be assessed.

As a robustness check of the PLS-SEM results, we also tested whether the following sociodemographic control variables influenced contracted patient satisfaction: age, sex, education level, and frequency of service use. No significant differences were found for the sociodemographic variables, so the control variables were excluded from further analysis.

Results

Measurement model

In evaluating the reflective measurement model, we followed the recommendations of the following: internal consistency reliability and discriminant validity. Internal consistency reliability validity is measured by Cronbach's

Table 2 Personal characteristics of the participants ($N = 624$)

Content		Number	Proportion
Sex	Man	452	72.44%
	Woman	172	27.56%
Age group	Under 18 years old	3	0.48%
	18~25	1	0.16%
	26~30	3	0.48%
	31~40	12	1.92%
	41~50	53	8.49%
	51~60	207	33.17%
	More than 60	345	55.29%
Education background	High school	134	21.47%
	College	178	28.53%
	Undergraduate	210	33.65%
	Graduate student or above	102	16.35%
Marital status	Be unmarried	25	4.01%
	Be married	599	95.99%
The average number of outpatient visits per year	0–1 times	135	21.63%
	2–3 times	260	41.67%
	4 times or more	229	36.70%
The average number of inpatient visits per year	0 times	413	66.19%
	1–2 times	182	29.17%
	3 times or more	29	4.65%
Other value-added services	frequently use	156	25%
	Do not use it much	468	75%

Rao *et al. BMC Health Services Research*   (2025) 25:7

Page 8 of 16

Table 3 Constructs (customer expectations, PE, IC and contracted patient satisfaction) and items used in this study

Construct	Definition	Claims label	Name of the variable of the measurement problem	Source claim
Customer expectations	Customer expectations	1. Before signing the contract, you can expect to get help from the contracted family doctor team when you need it	A1	[14, 15]
		2. Before signing the contract, you expect the medical skill of the family doctor team to be high	A2	Self-made
		3. Before signing the contract, you expect to sign up for the family doctor service to be reliable	A3	[14, 15]
Patient experience	Tangible	4. Your comfort with the medical environment	B1	Self-made
		5. Fluency of service throughout the medical treatment process	B2	[15, 16]
		6. Reasonable arrangement of each medical treatment project	B3	[15, 16], Self-made
	Reliability	7. Doctor's professional and technical level	B4	Self-made
		8. Family doctor's consultation service hours	B5	[14, 15]
		9. Chronic disease has been improved or controlled	B6	[14], Self-made
	Responsiveness	10. Waiting time for your visit	B7	[14, 16],Self -made
		11. The doctor explains the condition patiently and carefully	B8	[14, 16]
		12. Timeliness of contacting a family doctor	B9	[14, 16]
	Empathetic	13. The family doctor team takes the initiative to care	B10	[14, 16], Self-made
		14. Service attitude of medical team and service personnel	B11	Self-made
		15. Signed family doctors bring convenience to medical treatment	B12	[14, 16], Self-made
		16. Provide personalized medical services	B13	Self-made
	Continuance	17. Establish a perfect electronic health file	B14	[14], Self-made
		18. Provide regular physical examination services	B15	[14, 16], Self-made
		19. Provide continuous health management	B16	[14, 16], Self-made
Value perception	Value perception	20. According to the quality of the contracted service, you are satisfied with the personal expenses	C1	Self-made
		21. Compared with your personal expenses, you are satisfied with the quality of the contracted service	C2	[14], Self-made
		22. The contracted service meets your expectations	C3	[14], Self-made
Satisfaction	Satisfaction	23. You are more satisfied with H Hospital than before signing the contract	F1	Self-made
		24. You will recommend a contracted family doctor to your relatives, friends and neighbors	F2	Self-made
		25. Your overall satisfaction with the contracted service	F3	[14], Self-made

alpha and CR(Composite reliability) and discriminant validity is measured by the average variance extracted (AVE), which estimates the average variance shared between the studied constructs and their individual indicators. As reported in Table 4, all loadings of Cronbach's alpha and CRwere above the recommended criterion of 0.7. In addition, the AVE values of the constructs in this study were well above the recommended 0.5. Therefore, it could be concluded that the measurement model exhibited a satisfactory degree of convergent validity.

The factor load or weight of the measurement variable factors is shown in Tables 5 and 6. The factor load should be reported for reactive indicators, and the weights should be reported for formative indicators. In this study,

Rao *et al. BMC Health Services Research* (2025) 25:7

Page 9 of 16

Table 4 Results of the measurement model for the CE, PE IC and CPS

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Value perception	0.935	0.936	0.959	0.886
Reliability	0.867	0.872	0.918	0.790
Responsiveness	0.866	0.869	0.918	0.789
Tangible nature	0.925	0.925	0.952	0.869
S satisfaction	0.928	0.929	0.954	0.874
Empathetic	0.933	0.935	0.952	0.833
Continuance	0.911	0.913	0.944	0.850
Customer expectations	0.914	0.914	0.946	0.853

CE, PC, and CPS were measured with reactive indicators, and PE was measured with formative indicators.

Structural model

As the reflective measurement model was confirmed, we then continued to assess the studied structural model. We first evaluated the studied constructs to determine multicollinearity issues. Following the recommended steps of Hair et al. [33], we examined model collinearity issues by observing the variance inflation factor (VIF) to ensure that all the VIF values were below 3. The results of the structural model collinearity revealed VIF values below 2, suggesting no multicollinearity issues. This allowed us to examine and test the size and significance of the proposed path coefficients, as shown in Fig. 2. In addition, to measure the structural model prediction, we assessed the in-sample prediction of all endogenous constructs using R square. According to the suggestions of Hair et al. [33, 34], the R-squared values for PC (0.463) are moderate, while those for CPS (0.746) and PE (0.998) are relatively high.

The path coefficient values were standardized and revealed statistically significant values at the 1% significance level (the coefficient between customer expectations and contracted patient satisfaction at the 5% level). The relationship between PC and contracted patient satisfaction was positive (b=0.223), supporting H1.

H2 and H3, however, were contrary to reality because the relationships between CE and contracted patient satisfaction and between CE and PC were positive (b=0.129 and b=0.165, respectively). Finally, the structural model revealed a positive relationship between PE and PC (b=0.571) and between PE and CPS (b=0.613), supporting H4, H5, H6 and H7.

This finding that CE is positively related to PC and CPS is counterintuitive. Usually, the greater the expectation is, the greater the disappointment. However, sometimes,

this is not necessarily the case. For example, sometimes the actual result may exceed expectations, or personal values may affect satisfaction. Additionally, adjusting expectations can increase satisfaction. Other factors that affect satisfaction include mindset, views on failure, and recognition of effort. In the contract of family doctors in hospitals, a more objective understanding of contracted patients, as well as the impact on shared decision-making between doctors and patients, health awareness, and health enabling behaviors, will all have a positive impact on satisfaction.

The five primary latent variable indicators, service responsiveness, service empathy and service continuity, were all positively related to PE (b=0.391, b=0.247, b=0.256, b=0.289, b=0.181), which is consistent with H9, H10, H11, H12, and H13.

The test of the mediator and specific path effect is shown in Table 7.

The model's predictive power indicators are shown in Table 8.

Discussion

This study aimed to increase our understanding of the foundations of satisfaction with family contract services in hospitals. The contributions of this study can be summarized as follows.

The impact of patient experience on contracted services

Patient experience has an important influence on the doctor–patient relationship of contracted family doctor services. A good patient experience can enhance the trust, communication and cooperation between doctors and patients and help to build a positive doctor–patient relationship. From the five dimensions of patient experience designed by the author's survey, the satisfaction of contract signing and exchange combination can be improved from the following aspects:

Table 5 Factor load or weight of the measurement variable factors

	Path	OuterLoadings	LoadOrWeight
Items below are formative measurement and present by outer weights			
Your comfort in the medical environment	B1 → Patient experience		0.028
Waiting time for your visit	B10 → Patient experience		0.030
The doctor explained the condition patiently and carefully	B11 → Patient experience		0.034
Timeliness of contacting a family doctor	B12 → Patient experience		0.031
The family doctor team takes the initiative to care	B13 → Patient experience		0.033
Service attitude of medical team and service personnel	B14 → Patient experience		0.026
Signed family doctor to bring convenience to medical treatment	B15 → Patient experience		0.033
Provide personalized medical services	B16 → Patient experience		0.035
Before signing, you expect to have a high level of medical technology in the family doctor team	B2 → Patient experience		0.036
Before signing, you expect the family doctor service to be reliable	B3 → Patient experience		0.038
Your comfort in the medical environment	B4 → Patient experience		0.027
Fluency in service throughout the medical treatment process	B5 → Patient experience		0.028
Reasonable arrangement of each visit	B6 → Patient experience		0.030
The doctor's professional and technical level	B7 → Patient experience		0.030
Service hours of family doctors	B8 → Patient experience		0.031
Chronic disease is improved or controlled	B9 → Patient experience		0.033
Items below are reflective measurement and present by outer loading			
Before signing the contract, you expect to get help from the contracted family doctor team when you need it	A1 ← Customer expectations	0.904	
Before signing, you expect to have a high level of medical technology in the family doctor team	A2 ← Customer expectations	0.923	
Before signing, you expect the family doctor service to be reliable	A3 ← Customer expectations	0.943	
Your comfort in the medical environment	B1 ← tangible	0.919	
Waiting time for your visit	B10 ← empathetic	0.913	
The doctor explained the condition patiently and carefully	B11 ← empathic	0.890	
Timeliness of contacting a family doctor	B12 ← empathic	0.919	
The family doctor team takes the initiative to care	B13 ← empathetic	0.928	
Service attitude of medical team and service personnel	B14 ← Continuance	0.894	
Signed family doctor to bring convenience to medical treatment	B15 ← Continuance	0.926	
Provide personalized medical services	B16 ← Continuance	0.945	
Before signing, you expect to have a high level of medical technology in the family doctor team	B2 ← tangible	0.942	
Before signing, you expect the family doctor service to be reliable	B3 ← Tangible	0.935	
Your comfort in the medical environment	B4 ← Reliability	0.856	
Fluency in service throughout the medical treatment process	B5 ← Reliability	0.894	
Reasonable arrangement of each visit	B6 ← Reliability	0.915	
The doctor's professional and technical level	B7 ← responsiveness	0.891	
Service hours of family doctors	B8 ← responsiveness	0.869	
Chronic disease is improved or controlled	B9 ← responsiveness	0.904	
Based on the quality of the contracted service, you are satisfied with the cost paid by the individual	C1 ← Value Perception	0.929	
Compared to the cost you paid personally, you are satisfied with the quality of the contracted service	C2 ← Value Perception	0.951	
The contract service has met your expectations	C3 ← Value Perception	0.944	
You are more satisfied with Huaxi Hospital than before signing the contract	F1 ← S satisfaction	0.926	
Neighbors recommend signing a contract with a family doctor	F2 ← S satisfaction	0.933	
Your overall satisfaction with the contracted service	F3 ← S satisfaction	0.946	

The factor loading should be reported for reactive indicators, and weights should be reported for formative indicators

1. Tangibility includes aspects such as the service environment, equipment and facilities, and the image of medical staff. These factors directly affect patients' perceptions and evaluations of contracted family doctor services. A clean, tidy, and comfortable service environment can make patients feel relaxed and

Table 6 Path coefficients of IC, CE, PE and CPS

Path	Coefficients	SD	LBCI	UBCI	T	*P* value
PC → CPS	0.223	0.042	0.130	0.299	5.253	0.000
Reliability → PE	0.247	0.043	0.166	0.338	5.706	0.000
Responsive → PE	0.256	0.050	0.163	0.361	5.113	0.000
PE → PC	0.571	0.043	0.494	0.661	13.208	0.000
PE → CPS	0.613	0.041	0.542	0.704	15.072	0.000
Tangibility → PE	0.391	0.050	0.292	0.484	7.861	0.000
Empathy → PE	0.289	0.046	0.195	0.376	6.296	0.000
Continuity → PE	0.181	0.034	0.112	0.247	5.270	0.000
CE → PC	0.165	0.042	0.079	0.238	3.963	0.000
CE → CPS	0.129	0.034	0.062	0.196	3.829	0.000

LBCI lower bound of a confidence interval, *UBCI* upper bound of a confidence interval

comfortable, thereby increasing their satisfaction with the service. In addition, advanced and complete equipment and facilities can improve the work efficiency and service quality of family doctors and further increase patient satisfaction. The image and professional quality of medical staff also have an impact on patient satisfaction. Medical staff who are dressed neatly, professionally, and have a friendly and enthusiastic attitude can make patients feel respected and cared for, thereby increasing their satisfaction with the service. Clear and explicit service information allows patients to better understand the content and process of contracted family doctor services and

increases their satisfaction with the service. Family doctors can improve patient satisfaction by improving the service environment, upgrading equipment and facilities, enhancing the image and professional quality of medical staff, and providing clear service information.

2. Reliability is very important for the impact of contracted family doctor services. Reliability means that family doctors can consistently provide high-quality medical services, making patients feel at ease and trusted. If contracted family doctor services are reliable, patients will be more willing to choose and maintain a cooperative relationship with them. Reli-
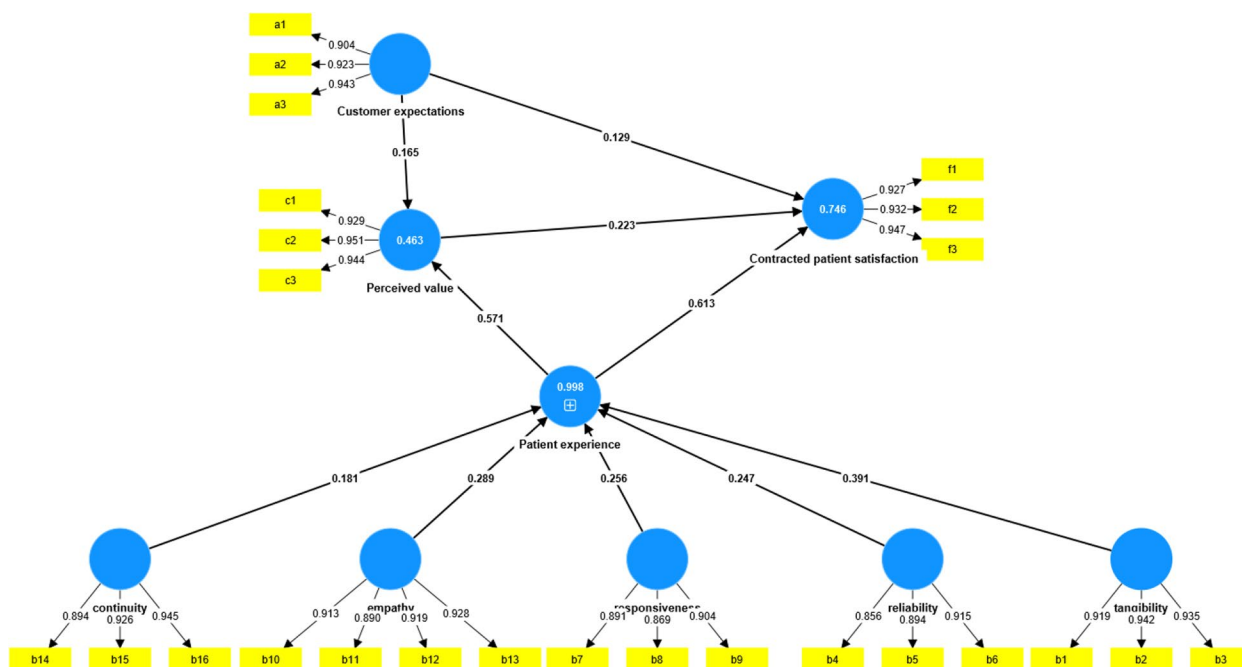

Fig. 2 Results of the structural model of the effect of customer expectations, PE and creativity on the satisfaction of customers and patients with hospital contract services. Standardized coefficients (** < 0.05, *** < 0.01)

Table 7 Test of the indirect and specific effects of IC, CE, PE and CPS

Path	Effects	SD	LBCI	UBCI	T	*P* value
Reliability → PE → PC	0.141	0.028	0.093	0.204	5.003	0.000
Reliability → PE → PC → CPS	0.031	0.009	0.015	0.050	3.443	0.001
Reliability → PE → CPS	0.152	0.029	0.101	0.215	5.175	0.000
Responsiveness → PE → PC	0.146	0.031	0.093	0.215	4.718	0.000
Responsiveness → PE → PC → CPS	0.032	0.009	0.017	0.053	3.563	0.000
Responsive → PE → CPS	0.157	0.035	0.098	0.233	4.545	0.000
PE → PC → CPS	0.127	0.028	0.072	0.185	4.467	0.000
Tangibility → PE → PC	0.223	0.032	0.163	0.293	6.885	0.000
Physicality → PE → PC → CPS	0.050	0.013	0.026	0.076	3.895	0.000
Physicality → PE → CPS	0.240	0.033	0.177	0.307	7.233	0.000
Empathic → PE → PC	0.165	0.027	0.112	0.220	6.100	0.000
Empathetic → PE → PC → CPS	0.037	0.010	0.018	0.058	3.574	0.000
Empatibility → PE → CPS	0.177	0.028	0.122	0.233	6.306	0.000
Continuity → PE → PC	0.103	0.021	0.063	0.148	4.807	0.000
Continuity → PE → PC → CPS	0.023	0.007	0.011	0.037	3.368	0.001
Continuity → PE → CPS	0.111	0.023	0.071	0.158	4.881	0.000
CE → PC → CPS	0.037	0.011	0.014	0.058	3.277	0.001

LBCI lower bound of a confidence interval, *UBCI* upper bound of a confidence interval

Table 8 Rsquare fsquare and Qsquare

Dependent variable	Independent variable2	Rsquare	Fsquare	Qsquare
Value perception	Customer expectations	0.463	0.034	0.405
Value perception	Patient experience		0.400	
Satisfaction	Customer expectations	0.746	0.042	0.645
Satisfaction	Value perception		0.105	
Satisfaction	Patient experience		0.697	

ability includes the following aspects: professional knowledge and skills: Family doctors need to have solid professional knowledge and rich clinical experience to accurately diagnose and treat various common diseases. They should also constantly update their knowledge to keep up with the latest medical advances. Service quality: Family doctors should provide high-quality medical services, including listening carefully to the needs and problems of patients, developing personalized treatment plans, and maintaining attention and communication during the treatment process. Reliability is a key factor in the success of contracted family doctor services. Only by providing high-quality, punctual, confidential, and continuous medical services can family doctors win the trust and loyalty of patients, thereby increasing the satisfaction and utilization rate of contracted services. Of course, in the process of implementing contracted family doctor services in the top three hospitals, the medical technology level, especially the

identification and disposal level of difficult and complicated diseases, should itself be one of the special advantages. In the entire process, the top three hospitals should pay more attention to connections with medical technology at the grassroots level so that the medical quality, safety and medical experience of patients in the entire process of medical treatment can be greatly improved.

3. The impact of responsiveness on contracted family doctor services mainly lies in the following aspects: highly responsive family doctors can respond to the needs and problems of patients in a timely and effective manner, making patients feel cared for and valued. This helps to build a good doctor–patient relationship and increase patient satisfaction with contracted family doctor services. Enhance patient trust: When family doctors can provide help quickly and accurately, patients are more likely to develop trust. This trust is very important for patients to

follow the doctor's treatment recommendations, actively participate in health management, and maintain a long-term doctor–patient cooperative relationship. Improving the quality of medical care: A highly responsive family doctor can detect a patient's health problems more promptly and take appropriate intervention measures. This helps to improve the quality of medical care and reduce the deterioration and complications of the disease. Improving service efficiency: Family doctors respond to the needs of patients in a timely manner, which can prevent patients from turning to other medical institutions for help due to long waiting times. This helps to improve the efficiency of contracted family doctor services and rationalize the use of medical resources. At the same time, responsiveness is also conducive to word-of-mouth communication: When patients are satisfied with the responsiveness of family doctors, they are more likely to share this positive experience with others. This is very beneficial for the promotion and development of contracted family doctor services and can attract more patients to choose contracted services.

4. The impact of empathy on contracted family doctor services mainly lies in the following aspects: Establish a good doctor–patient relationship; empathy can help family doctors better understand the needs and feelings of patients, thus establishing a more trusting and respectful doctor–patient relationship. This good relationship helps to increase patient satisfaction with family doctors and enhance their loyalty to contracted services. Improving the quality of medical services: Empathic family doctors can better meet the individual needs of patients and provide more humanized medical services. They can provide comprehensive, continuous, and coordinated medical services from the perspective of patients, improving service quality and patient satisfaction.

5. The impact of continuity on contracted family doctor services mainly lies in the following aspects. Through continuous services, family doctors can better understand the health status and needs of patients and provide personalized medical services. This helps to improve the quality of medical services and reduce the occurrence of misdiagnosis and missed diagnosis. Enhance patient trust: Patients and family doctors establish long-term cooperative relationships, which can enhance patient trust in family doctors. This trust helps patients better follow the doctor's treatment recommendations and improve the treatment effect. Improving medical efficiency: Continuous services can avoid duplicate examinations and diagnoses in different medical institutions, improve medical

efficiency, and reduce medical costs. Promote health management: Through continuous services, family doctors can manage and monitor the health of patients comprehensively, detect and address health problems in a timely manner, and prevent the occurrence and development of disease. Improve the medical experience: Continuous services allow patients to enjoy more convenient and efficient medical services, reduce the cumbersome procedures of medical treatment, and improve the medical experience. Overall, continuity is an important feature of contracted family doctor services. Through continuous services, family doctors can better meet the needs of patients, improve the quality and efficiency of medical services, promote health management, and improve the medical experience, thereby promoting the development of contracted family doctor services.

The impact of customer expectations on contracted services

Customer expectation theory applies to family doctor contract services. However, accurately defining patient expectations is also crucial. Patients may have diverse expectations regarding treatment, with some expecting a rapid recovery and others focusing more on comfort during the treatment process. Doctors need to discuss these expectations with patients to clarify treatment goals and feasibility. By doing so, doctors can better manage patient expectations and avoid unnecessary misunderstandings and disappointments. To enhance communication and define patient expectations accurately, doctors can take the following measures: build trust with patients, present clear information using simple and understandable language, listen attentively to patient opinions, and collaboratively develop a treatment plan based on patient expectations and real circumstances. Through improved communication and precise definitions of patient expectations, both doctors and patients can collaborate more effectively, enhancing treatment outcomes and patient satisfaction. Such communication also aids in fostering a positive doctor–patient relationship, enhancing patients' trust and reliance on contracted family doctor services.

The impact of perceived value on contracted family physician services

Specifically, the impact of perceived value on the contracted service satisfaction of family doctors is mainly reflected in the following aspects: Service quality: Customers evaluate the perceived value according to the quality of service they receive. If family doctors are able to provide high-quality medical care, including accurate diagnosis, effective treatment plans, and considerate care,

then customers will expect their high value and thus be satisfied with the service. Cost effectiveness: Customers compare the costs they pay for the contracted service. If the customer believes that the contracted service is reasonable and provides better health outcomes and convenience, he or she will find the service to have high value and be satisfied with the service. Personalized attention: Customers want family doctors to pay attention to their individual needs and health conditions and to provide personalized medical services. If the family doctor can fully understand the needs of the customers and provide targeted advice and treatment plans based on their situation, then the customers will think that they will gain more value and are satisfied with the service. Convenience and accessibility: Customers will consider the convenience and accessibility of contracted services. If family doctors can provide convenient appointments, nearby medical services and online counselling, then customers will see services of greater value and be satisfied with the service. Trust and relationships: Trust and good relationships between customers and family doctors can also affect perceived value. If customers have confidence in the professional ability and character of family doctors and establish close cooperation with family doctors, they will believe that they have gained more value and are satisfied with the service. In conclusion, perceived value has an important impact on GP contracted service satisfaction. Family doctors should pay attention to the needs of customers and provide high-quality and personalized medical services to improve their perceived value and satisfaction.

Implication in practice

The implementation of family doctor contracting services in hospitals is currently in the improving stage, and there may be many visible or hidden deficiencies in each process. Improving satisfaction issues is an effectively way to healthcare service utilization in the context of family doctor contract services.. In the realm of family doctor contract services, the complex interplay between satisfaction, customer expectations, perceived value, and patient experience is essential, shaping patient health outcomes and guiding the evolution of medical service delivery. Customer expectations are the bedrock of satisfaction, which is elevated when family doctors provide services that not only meet but surpass these expectations with a level of personalization and professionalism. The perceived value, a subjective measure of the benefits in relation to the costs, further amplifies this satisfaction, especially when patients feel they are receiving more than what they have invested. The patient experience, which includes every interaction from scheduling appointments to receiving follow-up care, is pivotal in personalizing care and significantly impacts satisfaction. These elements are not independent; they interact in a synergistic manner, where a positive patient experience can reinforce expectations and perceived value, creating a cycle that enhances overall satisfaction. This dynamic is particularly important in family doctor services, as these doctors often serve as the first point of contact, offering continuous and comprehensive care. The trust and rapport developed over time with family doctors can substantially influence patient satisfaction and health outcomes. Understanding these mechanisms is crucial for service providers to refine their processes and communication, thereby improving the quality of care and patient experience. From a policy perspective, recognizing these connections aids in the development of more effective health policies, promoting equitable and accessible medical services, especially in the context of China's tiered medical system and the implementation of family doctor services, where patient satisfaction and experience are critical for the effective utilization of health services.

In summary, to achieve the above points, in-depth exploration and continuous improvement need to take by the institutional managers and general practitioner teams by emphasizing satisfaction and continuously improving the effect of contract service.

Limitations and future research

First, since this study focused on only one medical institution, its universality and robustness in other medical institutions are limited. Since the study adopts a cross-sectional design and collects data using online surveys, the results may be affected by self-selection bias and causal inference. Therefore, future research should use longitudinal data to examine the potential causal relationships between the studied structures.

Second, for the strengthening of the utilization of contracted family doctor services, satisfaction may not be the only influencing factor. The utilization of medical services, especially contracted family doctor services, has more complex influencing relationships, which will provide ideas for analysing the impact path of contracted family doctor services in combination with other models.

Conclusions

This study contributes to our understanding of satisfaction with family contract services from the perspective of customers and patients with hospital contract services. Specifically, it reveals multifaceted associations among contracted patient satisfaction, customer expectations, PE and IC. From a leadership perspective, the findings highlight the core role of customer expectations in promoting satisfaction in family contract service.

Abbreviations
CPS   Contracted patient satisfaction
PC   Perceived value
CE   Customer expectations
PE   Patient experience
SEM   Structural equation modelling
AVE   Average variance extracted

Supplementary Information
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Supplementary Material 1.

Authors' contributions
RX designed the research and was a major contributor in writing the manuscript. LL guided the discussion. WX discussed the results. XJ modified the report. All authors participated in the design of the study, contributed to the drafting of the paper, and read and approved the final manuscript.

Data availability
All data and materials are available. The datasets generated for this study are available by contacting the corresponding author.

Declarations

Ethics approval and consent to participate
All methods of this study were carried out in accordance with relevant guidelines and regulations, and the study was approved by the West China Hospital Ethics Committee. No human or animal experimental research was conducted as part of this study. Informed consent to participate was obtained from all of the participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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References
1.   Cao Chenqi. An Empirical Study on the Impact of Hierarchical Medical System on Patient Satisfaction with Medical Services [D]. Capital University of Economics and Business, 2021.
2.   Tao Yinchao. The Impact of Family Doctor Contracting Services on Resident Satisfaction with the Government [D]. Zhejiang University, 2021.
3.   Li Jie, Zhu Xian, and Zeng Zhirong. Research on Satisfaction with Family Doctor Contracting Services from the Perspective of Stakeholders [J]. Health Economics Research, 2022.
4.   Yujie Z, Wenqiang Y, Yan Yu, et al. A Meta-analysis of Chinese Residents' Satisfaction with Family Doctor Contracting Services [J]. Chin J Evid Based Med. 2021;21(10):1148–53.
5.   Cui Yupeng. Research on the Influencing Factors and Countermeasures of "Signing but Not Meeting" in Family Doctor Contracting Services [D]. Jiangsu University, 2022.
6.   Jing Z, Shengran F, Xiaofeng S, et al. Study on the Job Satisfaction of Family Doctors from the Supplier's Perspective [J]. Chinese Primary Health Care. 2021;35(11):14–6.
7.   Dan Wu, Huang Xiaoguang Hu, Cuiling, et al. Research on the Influencing Factors of Satisfaction with Family Doctor Contracting Services for Chronic Disease Patients [J]. J Nanjing Med Univ (Social Sci Ed). 2020;20(1):71–6.
8.   Marcinowicz L, Chlabicz S, Grebowski R. Understanding Patient satisfaction with family doctor care [J]. Wiley. 2010;16(4):712–5.
9.   Marleen Smits, Linda Huibers, Anita Oude Bos, et al. Patient satisfaction with out-of-hours GP cooperatives: A longitudinal study. Informa UK Limited. 2012;30(4):206–213.
10.   Survey Research. Nationally Representative Surveys with Ipsos MORI [Z]. London United Kingdom: SAGE Publications Ltd.; 2017.
11.   van Charante EM. Patient satisfaction with large-scale out-of-hours primary health care in The Netherlands: development of a postal questionnaire [J]. Oxford University Press (oup). 2006;23(4):437–43.
12.   Gravelle H, Liu D, Santos R. How do clinical quality and patient satisfaction vary with provider size in primary care? Evidence from English general practice panel data [J]. Soc Sci Med. 2022;301(301):114936.
13.   Allan James, Schattner Peter, Stocks Nigel, et al. Does patient satisfaction of general practice change over a decade? [J]. Springer Science and Business Media LLC, (1).
14.   Hu Cuiling, Huang Xiaoguang. Investigation and analysis of the satisfaction and its influencing factors of residents in a certain city with family doctor contracting services [J]. Medicine and Society, 2020.
15.   My Mai-Thi-Thuy, Thong Bui-Quang, Chon Le-Van, et al. Springer Singapore [M]. Singapore: Springer Singapore, 2017: 185–190.
16.   Tukiran Martinus, Tan Pauline-Henriette-Pattyranie,Sunaryo Widodo. Obtaining customer satisfaction by managing customer expectation, customer perceived quality and perceived value. Growing Sci. 2021;9(2):481–488.
17.   Claes Fornell,Forrest V. Morgeson,G. Tomas M. Hult,et al. The Reign of the Customer[M]. Cham: Springer International Publishing, 2020: 71–96.
18.   Woo-Hyuk K. The Impact of Online Reviews on Customer Satisfaction: An Application of the American Customer Satisfaction Index (ACSI) [J]. Korea Acad Soc Tourism Manag. 2017;32(5):65–78.
19.   Assessing service quality dimensions in supermarkets using servqual scale[J]. Journal of Xidian University, 2020;14(5):122–127
20.   Augustyn Marcjanna-M.,Seakhoa-king Arthur,Mason Peter. SERVQUAL Scale[M]: Edward Elgar Publishing, 2022: 65–68.
21.   Yufang He, Xinyu Ma, YanYin C, et al. Research on Customer Satisfaction of Pharmaceutical E-Commerce Platform Based on the CCSI Model in China [J]. Chinese Pharmaceutical Industry. 2023;32(04):1–6.
22.   Yanhui Li, Qiuping Li, Jinchen S, et al. An Empirical Analysis of the Satisfaction of the Elderly with Smart Community Elderly Care Services and Its Influencing Factors - A Survey of Smart Elderly Care Bases in Some Areas of Wuhan [J]. Modern Bus Trade Industry. 2023;44(14):126–9.
23.   Andersen RM, Davidson PL, Baumeister SE (2013) Improving access to care. In: Kominski GF (ed) Changing the U.S. health care system: key issues in health services policy and management, 4th edn. Wiley, New York, p33–69
24.   Andersen's expanded behavioral model[J]. Encyclopedia of Gerontology and Population Aging, 2021: 1–448.
25.   Mu Gongyu, Zhang Lin, Ankang, et al. Practice of Family Doctor Contracting Services in the Whole Process Health Management Mode of Top Three Hospitals [J]. Chinese Journal of General Practice, 2023.
26.   Yuan Y, Caizheng Li, Shuyi Li, et al. Research on the Current Situation and Related Influencing Factors of Renewal of Family Doctor

Rao *et al. BMC Health Services Research*   (2025) 25:7

Page 16 of 16

Contracting Services in the Third-Class A Hospitals [J]. Chinese J Soc Med. 2023;40(02):209–13.

27. Rovito Michael. Knowledge and Perceived Value of Health Promotion Scale [DS]: American Psychological Association (APA), 2013.

28. Complications and Patient Expectations [DS]: British Editorial Society of Bone & Joint Surgery, 2022.

29. Hoff Timothy-J.. Oxford University Press [M]: Oxford University Press, 2017.

30. The Patient Experience [DS]: British Editorial Society of Bone & Joint Surgery, 2022.

31. Patient Experience Journal. Patient Experience Journal Awards: Celebrating our 2019 Recipients [J]. The Beryl Institute, 2020;7(1):110-112.

32. Henseler J, Sarstedt M. Goodness-of-fit indices for partial least squares path modeling [J]. Springer Sci Bus Media Llc. 2012;28(2):565–80.

33. Hair J, Alamer A. Partial Least Squares Structural equation modeling (PLS-SEM) in second language and education research: Guidelines using an applied example [J]. Res Methods Appl Linguistics. 2022;1(1):100027.

34. Latan Hengky, Hair Joseph-F., Noonan Richard, et al. Springer International Publishing [M]. Cham: Springer International Publishing, 2023: 3–21.

35. Usakli Ahmet, Rasoolimanesh S.-Mostafa. Emerald Publishing Limited [M]: Emerald Publishing Limited, 2023: 5–28.

36. Jr. Joseph-F.-Hair, Hult G.-Tomas-M., Ringle Christian-M., et al. OmniaScience [M]: OmniaScience, 2019.

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