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ORIGINAL RESEARCH

Behavioral Determinants of Hospital Selection in Urological Care: Evidence From China's Hierarchical Healthcare System

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Purpose: This study aims to identify the key factors influencing hospital selection among urological patients in China. Despite policy efforts to promote tiered care through the Hierarchical Diagnosis and Treatment (HDT) system, many patients continue to bypass primary care. Understanding the behavioral and psychological drivers of this pattern is essential for improving patient guidance and optimizing healthcare resource allocation.

Patients and Methods: Data were collected from a stratified random sample of 676 patients between June 10 and October 10, 2024 from tertiary, secondary, and community healthcare institutions in Jiangsu Province. We collected detailed information on demographic characteristics, clinical profiles, psychological states, health behaviors, and economic factors. Multinomial logistic regression was employed to identify independent predictors of hospital choice, while Sankey diagrams and multiple correspondence analysis (MCA) were used to visualize patient-level decision pathways and structural patterns.

Results: A substantial proportion of patients sought care at tertiary hospitals for conditions that could be effectively managed at lower levels, reflecting a disconnect between actual patient behavior and the goals of the HDT system. Hospital choice was shaped by clinical needs, emotional responses, and perceived institutional trust. Patients choosing tertiary hospitals were more likely to have undergone surgery, experienced severe pain, and reported negative emotional reactions. Secondary hospital users commonly had benign prostatic hyperplasia, moderate symptom burden, rural residence, and engaged in regular physical activity. Community healthcare facilities users typically presented with mild symptoms, shorter illness duration, mild anxiety, lower financial burden, and closer geographic proximity. Across all tiers, anxiety levels and trust perceptions emerged as key behavioral drivers contributing to the bypassing of primary care.

Conclusion: Despite policy efforts to promote primary care, many patients with manageable conditions continue to bypass lower-tier facilities. Building trust and providing triage support in primary care are essential for achieving the goals of hierarchical healthcare.

Keywords: healthcare equity, urological patients, hierarchical diagnosis and treatment, hdt, hospital selection, multiple correspondence analysis

Introduction

The uneven distribution of healthcare resources remains a global challenge, often reflected in the coexistence of overcrowded tertiary hospitals and underutilized primary care facilities.[1,2] Urological diseases, such as benign prostatic hyperplasia and urolithiasis, contribute significantly to this strain.[3,4] Traditionally more common among older adults, these conditions are increasingly affecting younger populations, amplifying demand across all tiers of the healthcare system.[5–7] To address such pressures, China has promoted the Hierarchical Diagnosis and Treatment (HDT) system, which seeks to match patients to care levels according to disease severity.[2,8,9] However, the success of such structural reforms depends not only on institutional design but also on how patients respond in practice. Understanding the behavioral logic behind healthcare-seeking decisions is therefore essential to achieving the intended function of the

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HDT framework.[10–12] In practice, the absence of a mandatory referral mechanism allows patients to bypass primary and secondary care.[13] As a result, even individuals with manageable urological symptoms often self-refer to tertiary hospitals, contributing to resource congestion at the top of the system and undermining the efficiency of tiered care delivery.

Recent empirical studies conducted in cities such as Wuhan and Shanghai suggest that this divergence from policy design is shaped not only by clinical needs but also by behavioral factors, including institutional trust, perceptions of diagnostic capacity, and the desire for emotional reassurance.[14,15] Even when patients report satisfaction with community health center services, concerns about continuity of care, provider experience, and equipment often lead them to bypass lower-tier institutions.[9] These findings underscore a persistent gap between system structure and patient preferences, limiting the effectiveness of HDT implementation.

To better understand this misalignment, a behavioral perspective is needed. This study draws conceptually on the Behavioral Model of Health Services Use developed by Ronald Andersen, which categorizes healthcare utilization into predisposing characteristics, enabling resources, and need factors.[16] Psychological elements such as anxiety and emotional response have also been integrated into more recent application of the model.[17] It serves as a useful reference point for structuring our analysis and interpreting observed patterns in hospital selection.

Cross-national experiences further highlight the limits of institutional design alone in shaping care-seeking behavior. The United Kingdom's National Health Service enforces gatekeeping through general practitioners, helping regulate specialist access, although issues such as long wait times and satisfaction persist.[18] Japan adopts a soft referral approach: while financial incentives are provided to encourage proper referral pathways, many patients still bypass lower-tier care due to concerns over quality.[19] In other high-income settings such as Denmark and Australia, stronger referral systems are supported by digital tools and navigation services.[20,21] In contrast, low- and middle-income countries face more prominent barriers related to affordability, trust, and health literacy.[22]

Yet across these contexts, there remains limited empirical research examining how multiple behavioral factors, demographic, clinical, psychological, interact in shaping hospital choice within specialty care domains such as urology. Moreover, few studies have attempted to visualize how these determinants influence actual patient pathways, which limits their applicability for policy design.

Purpose of the Research

In response, our study focuses on urological patients in Jiangsu Province, China. This study aims to identify key demographic, clinical, and psychological determinants influencing hospital choice among urological patients and to visualize their decision pathways within the HDT framework. Rather than just describing usage patterns, we use Andersen's model as a conceptual lens and apply various visualization methods to better understand decision-making pathways. Our findings are intended to support more targeted strategies for improving the HDT system and helping patients receive the right care in the right place.

Material and Methods

Participants

This study targeted adult patients (aged 18 years and above) with confirmed or physician-suspected urological conditions, recruited from tertiary, secondary, and community healthcare institutions across northern, central, and southern Jiangsu Province, China. Jiangsu was selected as the study setting due to its socioeconomic diversity and representative medical infrastructure, encompassing both urban and semi-urban populations.

A stratified random sampling strategy was applied to ensure proportional representation across different geographic regions and healthcare facility levels. Inclusion criteria were: (1) age ≥18 years; (2) current or recent urological diagnosis; and (3) ability to complete the questionnaire independently or with assistance. Exclusion criteria included cognitive impairment, severe psychiatric illness, or incomplete responses to key variables. While the study was limited to one province, the sampling method and institutional diversity increase the generalizability of findings to other regions in China with similar demographic and healthcare system profiles.

Data Collection Procedures

Data collection was conducted between June 10 and October 10, 2024, using a mixed-mode approach that combined digital and face-to-face methods to reach a wide demographic spectrum. Online surveys were distributed via the Wen Juan Xing platform (Changsha Ranxing Information Technology Co., Ltd., Hunan, China), disseminated through official hospital WeChat accounts and verified patient support groups. For older or less digitally literate participants, trained research assistants conducted paper-based, face-to-face interviews within outpatient departments. All responses from paper questionnaires were independently entered by two researchers to ensure accuracy.

The survey began with an informed consent section outlining the study's purpose, voluntary participation, data confidentiality, and estimated completion time. Online participants were required to confirm consent before proceeding, while written consent was obtained for face-to-face surveys. No personally identifiable data were collected, and responses were anonymized for analysis. Ethical approval was obtained from the Ethics Committee of Xuzhou Medical University (Approval No. XZHMU-2024Z021), and the study complied with the principles of the Declaration of Helsinki.

Sample Size Calculation

Recent epidemiological studies have reported a prevalence ranging from 10% to 30% for major urological conditions such as benign prostatic hyperplasia, nephrolithiasis, and urinary tract infections among Chinese adults, with higher rates observed in aging populations and urban areas.[23] In the absence of definitive prevalence for direct tertiary care utilization among urological patients, a conservative estimate of 50% was applied to maximize sample size, aligning with standard epidemiological practice for variability maximization.[24,25] The minimum required sample size was estimated using a standard formula (Equation (1)) for cross-sectional studies:

$$n = \frac{Z^2 p(1-p)}{d^2} \tag{1}$$

Assuming a 95% confidence level (Z = 1.96), a margin of error (d) of 5%, and an expected prevalence (p) of 50% for tertiary care utilization among urological patients, the calculated sample size was 385. Considering a potential 20% non-response or data loss rate, we applied an oversampling strategy, resulting in a final target sample size of approximately 482 participants at least. Although the calculation was based on simple random sampling, the stratified sampling design may introduce intraclass correlation within regions or facility levels. This potential design effect was acknowledged; however, the final achieved sample size substantially exceeded the minimum requirement, partially offsetting any reduction in statistical efficiency.

Instruments

Demographic and Socioeconomic Characteristics

Data were collected on participants' age, sex, ethnicity, education level, residence location, type of health insurance, occupational status, and average monthly household income. Additionally, whether any family members in healthcare were recorded as a proxy for potential health literacy and influence on care-seeking behavior. These variables were selected based on Andersen's Behavioral Model, in which demographic and socioeconomic factors function as key predisposing and enabling components influencing healthcare utilization.[26] Prior research has consistently shown their relevance to hospital choice, health service access, and perceptions of care quality.[10,27]

Disease Profile and Symptomatology

Urological diagnoses were extracted from hospital records or self-reported physician-confirmed conditions. Details on disease type, treatment modality, illness duration, and pain severity were recorded. The emotional response to symptoms on daily functioning was assessed via structured questionnaire items (eg, urinary frequency/urinary retention symptoms).

Health Behaviors and Psychological Assessment

Health-related behaviors included smoking status, alcohol consumption, and physical activity intensity/frequency/duration. The number of chronic conditions was also recorded. Health information-seeking behavior was assessed using a dedicated item: "How often do you learn about health-related information?" with response options: Never/

Occasionally/Regularly. Preventive screening awareness was captured by asking "When was your last medical physical examination?" with categorical responses ranging from within 1 month to more than half a year ago. This served as a proxy for engagement with preventive screening awareness.

Psychological well-being was assessed using two validated scales. The Insomnia Severity Index (ISI) was used to measure the severity of sleep disturbances. Each item is scored on a 5-point Likert scale (0 = no problem to 4 = very severe), producing a total score ranging from 0 to 28, with higher scores indicating more severe insomnia.[28,29] The Generalized Anxiety Disorder-7 (GAD-7) scale was used to evaluate symptoms of anxiety. This 7-item tool measures the frequency of anxiety symptoms on a 4-point scale (0 = not at all to 3 = nearly every day), yielding a total score between 0 and 21. Standard cut-off points of 5, 10, and 15 were used to classify mild, moderate, and severe anxiety, respectively.[30,31]

Economic Burden and Accessibility

Economic burden was evaluated in two ways. First, objective financial cost was captured by asking participants to report their medical expenditures after insurance reimbursement (post-reimbursement medical expenses). Second, subjective affordability was assessed through a 3-point item: "Can your current income cover your medical expenses?", with responses ranging from fully able to unable. Accessibility was evaluated based on travel time (in minutes) to the nearest tertiary hospital and community health center, with predefined time categories: within 10 minutes, 10–30 minutes, and more than 30 minutes. The complete survey instruments were provided in Appendix 1.

Statistical Analysis

All analyses were conducted using R software (version 4.4.2). Descriptive statistics were presented as means ± standard deviations for continuous variables, and frequencies and percentages for categorical variables. Group comparisons across healthcare facility types (community, secondary, tertiary) were performed using chi-squared tests or Fisher's exact tests, as appropriate. To identify independent predictors of healthcare facility selection, a multinomial logistic regression model was constructed with secondary hospitals as the reference category. This method allows estimation of relative odds of choosing community or tertiary care over secondary care when the outcome variable is nominal and unordered. Covariates with $p < 0.10$ in univariate analyses were entered into the model. Results were expressed as odds ratios (ORs) with 95% confidence intervals (CIs). Model adequacy was assessed using likelihood ratio tests and pseudo R^2 indices. Multicollinearity was assessed using variance inflation factors (VIF), all of which were within acceptable thresholds.

To visualize patterns of patient flow from characteristics to care destination, Sankey diagrams were generated using the ggalluvial package, illustrating proportional trends across care settings. In addition, Multiple Correspondence Analysis (MCA) was performed using the FactoMineR package to explore underlying associations among categorical variables and to reveal structural dimensions influencing decision pathways.[32,33]

To enhance interpretability, radar charts were constructed based on normalized regression coefficients from the multinomial models, providing a comparative visualization of each factor's relative impact on healthcare facility choice. All variables included in the regression analysis had complete data, and complete-case analysis was applied without any reduction in sample size or compromise in statistical power. Statistical significance was defined as $p < 0.05$ (two-tailed).

Results

Participant Characteristics

A total of 800 questionnaires were distributed, including 200 via face-to-face interviews and 600 via online platforms. Of the face-to-face surveys, 167 were completed completely and 190 surveys were returned as valid. Among the online surveys, 546 valid and fully completed responses were obtained. After combining both sources, a total of 713 valid and complete questionnaires were collected, yielding an overall effective response rate of 89.1%. Subsequently, 37 questionnaires were excluded due to inconsistencies with basic physiological plausibility criteria, resulting in a final analytic sample of 676 participants (Figure 1). Among all respondents, 46.0% (n = 311) selected tertiary hospitals, 44.1% (n = 298) chose secondary hospitals, and 9.9% (n = 67) sought care at community healthcare facilities. The sample comprised 76.6% men and 23.4% women, consistent with the typical sex distribution of urological patients (Table 1).

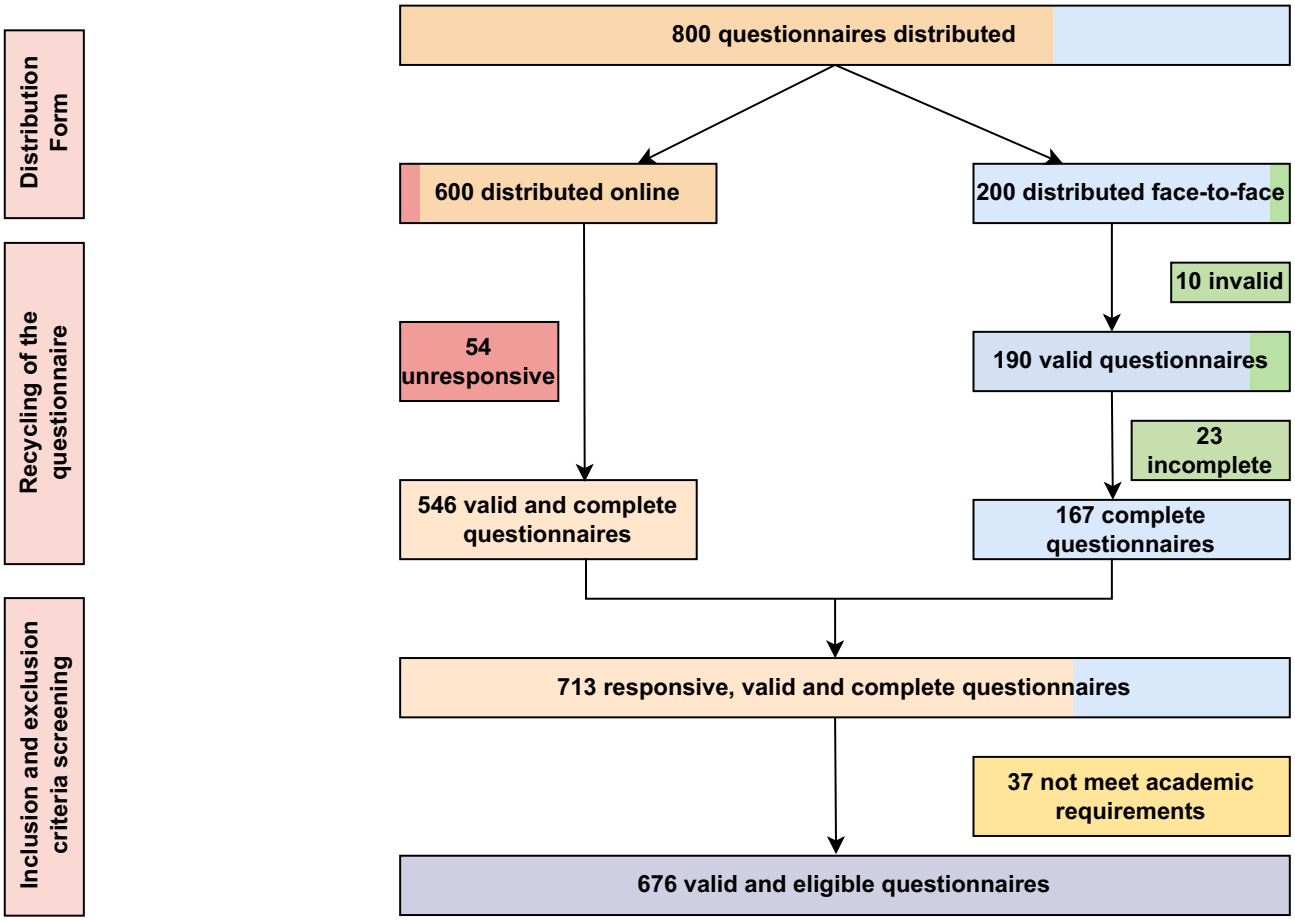

Figure 1 Flow Chart of Participants.

Group Differences Across Facility Types

Comparative analyses revealed statistically significant differences among the three hospital choice groups across multiple domains. Demographic characteristics were observed in sex, age, ethnicity, education level, residence location, type of health insurance, occupational status, average monthly household income, and whether respondents had family members in healthcare. Clinical and disease-related factors significantly associated with healthcare facility selection included urological diagnoses, treatment modality, illness duration, urinary frequency, urinary retention symptoms, pain severity, and emotional response to symptoms. Health-related behavioral factors exhibited significant variations across different hospital types, encompassing smoking status and alcohol consumption, physical activity frequency, health literacy levels,

Table 1 Participant Characteristics: Demographic, Clinical, Behavioral, Psychological, and Socioeconomic (n = 676)

Characteristics	Total Participants, n (%)	Medical Institution Selection			*P*
		Secondary Hospitals, n (%)	Tertiary Hospitals, n (%)	Community Healthcare Facilities, n (%)	
Total	676 (100.0)	298 (44.1)	311 (46.0)	67 (9.9)	
Sex					<0.001
Male	518 (76.6)	260 (87.2)	209 (67.2)	49 (73.1)	
Female	158 (23.4)	38 (12.8)	102 (32.8)	18 (26.9)	

(*Continued*)

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Table 1 (Continued).

Characteristics	Total Participants, n (%)	Medical Institution Selection			*P*
		Secondary Hospitals, n (%)	Tertiary Hospitals, n (%)	Community Healthcare Facilities, n (%)	
Age, year					<0.001
<40	199 (29.4)	61 (20.5)	109 (35.0)	29 (43.3)	
40-	256 (37.9)	130 (43.6)	105 (33.8)	21 (31.3)	
>60	221 (32.7)	107 (35.9)	97 (31.2)	17 (25.4)	
Ethnic group					<0.001
Han	607 (89.8)	267 (89.6)	289 (92.9)	51 (76.1)	
Others	69 (10.2)	31 (10.4)	22 (7.1)	16 (23.9)	
Education level					<0.001
Illiterate/Primary school	189 (28.0)	139 (46.6)	38 (12.2)	12 (17.9)	
Junior/Senior high school (Vocational)	290 (42.9)	113 (38.0)	142 (45.7)	35 (52.2)	
Bachelor's degree and above	197 (29.1)	46 (15.4)	131 (42.1)	20 (29.9)	
Residence location					<0.001
Urban	294 (43.5)	55 (18.5)	207 (66.6)	32 (47.8)	
Rural	382 (56.5)	243 (81.5)	104 (33.4)	35 (52.2)	
Type of health insurance					<0.001
Urban and rural resident medical insurance	264 (39.0)	162 (54.4)	86 (27.7)	16 (23.9)	
Urban employee medical insurance	239 (35.4)	56 (18.8)	161 (51.8)	22 (32.8)	
New rural cooperative medical insurance	111 (16.4)	59 (19.8)	36 (11.5)	16 (23.9)	
No insurance/Commercial/Public free/Others	62 (9.2)	21 (7.0)	28 (9.0)	13 (19.4)	
Occupational status					<0.001
Off-duty/Retired/Unemployed	248 (36.7)	86 (28.9)	135 (43.4)	27 (40.3)	
Workers	139 (20.6)	82 (27.5)	42 (13.5)	15 (22.4)	
Private Sector/Self-employed	172 (25.4)	95 (31.9)	62 (19.9)	15 (22.4)	
Students/Civil Servants/SOE/Employees	117 (17.3)	35 (11.7)	72 (23.2)	10 (14.9)	
Monthly income, yuan					<0.001
<3000	157 (23.2)	40 (13.4)	97 (31.2)	20 (29.9)	
3000-	267 (39.5)	158 (53.0)	89 (28.6)	20 (29.9)	
5000-	159 (23.5)	79 (26.5)	66 (21.2)	14 (20.9)	
>10,000	93(13.8)	21 (7.1)	59 (19.0)	13 (19.3)	
Having family member in healthcare					<0.001
Immediate family members	111(16.4)	27 (9.1)	63 (20.3)	21 (31.3)	
Extended family members	297 (44.0)	204 (68.5)	77 (24.7)	16 (23.9)	
None	268 (39.6)	67 (22.5)	171 (55.0)	30 (44.8)	
Urological diagnosis					<0.001
Prostate cancer/Nephrolithiasis	254 (37.5)	72 (24.2)	152 (48.9)	30 (44.8)	
Benign Prostatic Hyperplasia (BPH)	206 (30.5)	154 (51.7)	46 (14.8)	6 (9.0)	
Urinary Tract Infection (UTI)	152 (22.5)	62 (20.8)	64 (20.5)	26 (38.8)	
Balanitis/Others	64 (9.5)	10 (3.3)	49 (15.8)	5 (7.4)	
Treatment modality					<0.001
Medication only	229 (33.9)	122 (40.9)	77 (24.8)	30 (44.8)	
Surgery only	149 (22.0)	37 (12.4)	107 (34.4)	5 (7.4)	
Regular followup only	118 (17.5)	72 (24.2)	29 (9.3)	17 (25.4)	
Comprehensive treatment	180 (26.6)	67 (22.5)	98 (31.5)	15 (22.4)	
Duration of illness, month					<0.001
<3	275 (40.7)	88 (29.5)	143 (46.0)	44 (65.7)	
3-	251 (37.1)	156 (52.3)	80 (25.7)	15 (22.4)	
>12	150 (22.2)	54 (18.1)	88 (28.3)	8 (11.9)	

(*Continued*)

Table 1 (Continued).

Characteristics	Total Participants, n (%)	Medical Institution Selection			*P*
		Secondary Hospitals, n (%)	Tertiary Hospitals, n (%)	Community Healthcare Facilities, n (%)	
Pain severity					<0.001
Low	198 (29.3)	76 (25.5)	102 (32.8)	20 (29.9)	
Medium	246 (36.4)	173 (58.1)	54 (17.4)	19 (28.3)	
High	232 (34.3)	49 (16.4)	155 (49.8)	28 (41.8)	
Urinary retention symptom					<0.001
Never	176 (26.0)	30 (10.1)	124 (39.9)	22 (32.8)	
Less than half of time	304 (45.0)	172 (57.7)	112 (36.0)	20 (29.9)	
More than half of time	196 (29.0)	96 (32.2)	75 (24.1)	25 (37.3)	
Urination frequency					<0.001
Never	165 (24.4)	31 (10.4)	106 (34.1)	28 (41.8)	
Less than half of time	327 (48.4)	187 (62.8)	123 (39.5)	17 (25.4)	
More than half of time	184 (27.2)	80 (26.8)	82 (26.4)	22 (32.8)	
Impact Of symptoms on daily life					<0.001
Never	162 (24.0)	24 (8.1)	121 (38.9)	17 (25.4)	
Occasionally	214 (31.6)	155 (52.0)	43 (13.8)	16 (23.9)	
Often	231 (34.2)	101 (33.9)	110 (35.4)	20 (29.9)	
Always	69 (10.2)	18 (6.0)	37 (11.9)	14 (20.8)	
Frequency of disease concerns					<0.001
Never	130 (19.2)	26 (8.7)	85 (27.3)	19 (28.3)	
Occasionally	163 (24.1)	99 (33.2)	46 (14.8)	18 (26.9)	
Often	289 (42.8)	146 (49.0)	126 (40.5)	17 (25.4)	
Always	94 (13.9)	27 (9.1)	54 (17.4)	13 (19.4)	
Emotional response to symptoms					<0.001
Positive	223 (33.0)	148 (49.7)	57 (18.3)	18 (26.9)	
Neutral	151 (22.3)	75 (25.2)	67 (21.5)	9 (13.4)	
Negative	302 (44.7)	75 (25.1)	187 (60.2)	40 (59.7)	
Smoking status					<0.001
Never smoked	256 (37.9)	60 (20.1)	167 (53.7)	29 (43.3)	
Less than 20 years	266 (39.3)	142 (47.7)	94 (30.2)	30 (44.8)	
More than 20 years	154 (22.8)	96 (32.2)	50 (16.1)	8 (11.9)	
Smoking frequency					<0.001
No smoker/Occasional smoker	328 (48.5)	76 (25.5)	208 (66.9)	44 (65.7)	
Light smoker (1–10 Cigarettes/day)	244 (36.1)	173 (58.1)	56 (18.0)	15 (22.4)	
Heavy smoker (More than 10 Cigarettes/day)	104 (15.4)	49 (16.4)	47 (15.1)	8 (11.9)	
Alcohol consumption					<0.001
Never	173 (25.6)	32 (10.7)	123 (39.5)	18 (26.9)	
Occasionally	373 (55.2)	225 (75.5)	124 (39.9)	24 (35.8)	
Always	130 (19.2)	41 (13.8)	64 (20.6)	25 (37.3)	
Physical activity frequency					<0.001
Never exercise	82 (12.2)	18 (6.0)	52 (16.7)	12 (17.9)	
Exercise 1–2 times/week	276 (40.8)	120 (40.3)	128 (41.2)	28 (41.8)	
Exercise 3–5 times/week	247 (36.5)	143 (48.0)	85 (27.3)	19 (28.4)	
Everyday	71 (10.5)	17 (5.7)	46 (14.8)	8 (11.9)	
Physical activity duration per session					<0.001
Less than 30 minutes	239 (35.4)	64 (21.5)	140 (45.0)	35 (52.2)	
30 minutes to 1 hour	392 (58.0)	221 (74.2)	146 (46.9)	25 (37.3)	
More than 1 hour	45 (6.6)	13 (4.3)	25 (8.1)	7 (10.5)	

(*Continued*)

Table 1 (Continued).

Characteristics	Total Participants, n (%)	Medical Institution Selection			*P*
		Secondary Hospitals, n (%)	Tertiary Hospitals, n (%)	Community Healthcare Facilities, n (%)	
Physical activity intensity per session					<0.001
Low intensity	312 (46.2)	68 (22.8)	212 (68.2)	32 (47.8)	
Moderate intensity	324 (47.9)	216 (72.5)	83 (26.7)	25 (37.3)	
High intensity	40 (5.9)	14 (4.7)	16 (5.1)	10 (14.9)	
Health information-seeking behavior					<0.001
Never	50 (7.4)	21 (7.1)	22 (7.1)	7 (10.4)	
Occasionally	413 (61.1)	237 (79.5)	147 (47.3)	29 (43.3)	
Regularly	213 (31.5)	40 (13.4)	142 (45.6)	31 (46.3)	
Time since last medical physical examination					<0.001
Recent, within the last month	111 (16.4)	23 (7.7)	74 (23.8)	14 (20.9)	
Short-term, within the last three months	191 (28.3)	86 (28.8)	88 (28.3)	17 (25.4)	
Mid-term, within the last six months	211 (31.2)	134 (45.0)	63 (20.3)	14 (20.9)	
Long-term, more than half a year ago	163 (24.1)	55 (18.5)	86 (27.7)	22 (32.8)	
Sleep quality					0.001
No significant insomnia	404 (59.8)	200 (67.1)	175 (56.3)	29 (43.3)	
Subthreshold insomnia	129 (19.1)	53 (17.8)	64 (20.6)	12 (17.9)	
Moderate to severe insomnia	95 (14.1)	30 (10.1)	46 (14.7)	19 (28.3)	
Severe insomnia	48 (7.0)	15 (5.0)	26 (8.4)	7 (10.4)	
Anxiety level					<0.001
No anxiety	377 (55.8)	197 (66.1)	161 (51.8)	19 (28.4)	
Mild anxiety	158 (23.4)	46 (15.4)	89 (28.6)	23 (34.3)	
Moderate anxiety	90 (13.3)	36 (12.1)	39 (12.5)	15 (22.4)	
Severe anxiety	51 (7.5)	19 (6.4)	22 (7.1)	10 (14.9)	
Number of channels for health information-seeking					<0.001
1	300 (44.4)	176 (59.1)	105 (33.8)	19 (28.4)	
2	211 (31.2)	81 (27.2)	105 (33.8)	25 (37.3)	
≥ 3	165 (24.4)	41 (13.7)	101 (32.4)	23 (34.3)	
Number of chronic conditions					<0.001
none	262 (38.8)	67 (22.5)	161 (51.8)	34 (50.7)	
1	336 (49.7)	202 (67.8)	108 (34.7)	26 (38.8)	
≥ 2	78 (11.5)	29 (9.7)	42 (13.5)	7 (10.5)	
Post-reimbursement medical expenses, yuan					<0.001
< 1000	128 (18.9)	32 (10.7)	75 (24.2)	21 (31.3)	
1000-	289 (42.8)	161 (54.0)	104 (33.4)	24 (35.8)	
5000-	186 (27.5)	100 (33.6)	70 (22.5)	16 (23.9)	
≥ 20,000	73 (10.8)	5 (1.7)	62 (19.9)	6 (9.0)	
Income affordability for medical care					<0.001
Fully able	185 (27.4)	48 (16.1)	117 (37.6)	20 (29.9)	
Moderately able	428 (63.3)	227 (76.2)	163 (52.4)	38 (56.7)	
Unable	63 (9.3)	23 (7.7)	31 (10.0)	9 (13.4)	
Travel time to nearest tertiary hospital					<0.001
< 10 minutes	57 (8.4)	13 (4.4)	29 (9.4)	15 (22.4)	
10–30 minutes	300 (44.4)	134 (45.0)	141 (45.3)	25 (37.3)	
≥ 30 minutes	319 (47.2)	151 (50.6)	141 (45.3)	27 (40.3)	

(*Continued*)

Table 1 (Continued).

Characteristics	Total Participants, n (%)	Medical Institution Selection			*P*
		Secondary Hospitals, n (%)	Tertiary Hospitals, n (%)	Community Healthcare Facilities, n (%)	
Travel time to nearest community hospital					0.090
< 10 minutes	304 (45.0)	122 (40.9)	151 (48.6)	31 (46.3)	
10-30 minutes	280 (41.4)	136 (45.6)	122 (39.2)	22 (32.8)	
≥ 30 minutes	92 (13.6)	40 (13.5)	38 (12.2)	14 (20.9)	

health information-seeking behavior, preventive screening awareness, number of chronic conditions, and psychological factors such as insomnia and anxiety. Additionally, economic considerations emerged as crucial determinants, with significant differences observed in post-reimbursement medical expenses, income affordability for medical care, and travel time to healthcare facilities across different hospital choice groups. These findings suggest that healthcare facility selection reflects a multifaceted behavioral and contextual profile rather than a single determinant.

Determinants of Healthcare Facility Choice

A Multinomial logistic regression (using secondary hospitals as the reference group) identified predictors across five domains: demographic, clinical, behavioral, psychological, and economic (Table 2). The multinomial logistic regression model showed good overall fit ($G^2 = 342.84$, $p < 0.001$). Pseudo R^2 values indicated acceptable explanatory power (McFadden's $R^2 = 0.268$, Cox & Snell $R^2 = 0.398$, and Nagelkerke $R^2 = 0.468$). VIF values were below 1.2, suggesting

Table 2 Determinants of Hospital Choice Among Tertiary, Secondary, and Community Healthcare Facilities

Characteristics	Medical Institution Selection			
	Tertiary Hospital/Secondary Hospital		Community Healthcare Facility/Secondary Hospital	
	OR (95% CI)	*P*	OR (95% CI)	*P*
Residence location				
Rural/Urban	0.264 (0.160–0.436)	<0.001	0.691 (0.347–1.374)	0.292
Urological diagnosis				
Balanitis or others/Prostate cancer or nephrolithiasis	1.491 (0.596–3.731)	0.393	0.641 (0.174–2.361)	0.504
UTI/Prostate cancer or nephrolithiasis	0.620 (0.335–1.149)	0.129	0.875 (0.411–1.862)	0.729
BPH/Prostate cancer or nephrolithiasis	0.417 (0.219–0.794)	0.008	0.350 (0.118–1.041)	0.059
Treatment modality				
Comprehensive treatment/Medication only	1.316 (0.719–2.409)	0.373	0.709 (0.306–1.639)	0.421
Regular followup only/Medication only	0.691 (0.329–1.451)	0.328	1.385 (0.594–3.231)	0.451
Surgery only/Medication only	3.192 (1.557–6.541)	0.002	0.674 (0.205–2.222)	0.517
Duration of illness				
>12 months/<3 months	1.236 (0.628–2.430)	0.540	0.453 (0.166–1.236)	0.122
3–12 months/<3 months	0.782 (0.453–1.352)	0.379	0.353 (0.165–0.754)	0.007
Pain severity				
High/Low	1.637 (0.919–2.918)	0.094	1.271 (0.577–2.799)	0.551
Medium/Low	0.503 (0.277–0.913)	0.024	0.799 (0.345–1.853)	0.602
Urination frequency				
More than half of time/Never	0.798 (0.380–1.679)	0.553	0.655 (0.262–1.639)	0.366
Less than half of time/Never	0.699 (0.371–1.317)	0.268	0.263 (0.111–0.620)	0.002

(*Continued*)

Table 2 (Continued).

Characteristics	Medical Institution Selection			
	Tertiary Hospital/Secondary Hospital		Community Healthcare Facility/Secondary Hospital	
	OR (95% CI)	*P*	OR (95% CI)	*P*
Emotional response to symptoms				
Negative sentiment/Positive sentiment	2.835 (1.569–5.123)	0.001	1.843 (0.842–4.035)	0.126
Neutral sentiment/Positive sentiment	2.191 (1.095–4.385)	0.027	1.215 (0.440–3.360)	0.707
Physical activity intensity per session				
High intensity/Low intensity	0.206 (0.076–0.560)	0.002	1.146 (0.372–3.525)	0.813
Moderate intensity/Low intensity	0.399 (0.232–0.686)	0.001	0.609 (0.291–1.273)	0.188
Time since last medical physical examination				
Long-term, more than half a year ago/Recent, within the last month	0.647 (0.298–1.406)	0.272	1.774 (0.645–4.881)	0.267
Mid-term, within the last six months/Recent, within the last month	0.333 (0.159–0.698)	0.004	0.533 (0.191–1.483)	0.228
Short-term, within the last three months/Recent, within the last month	0.785 (0.378–1.629)	0.515	0.922 (0.353–2.408)	0.869
Number of chronic conditions				
2 or more/none	0.705 (0.318–1.560)	0.388	1.219 (0.394–3.774)	0.732
1 disease/none	0.570 (0.333–0.974)	0.040	0.893 (0.437–1.825)	0.757
Anxiety level				
Severe anxiety/No anxiety	0.761 (0.310–1.868)	0.551	1.579 (0.502–4.971)	0.435
Moderate anxiety/No anxiety	0.483 (0.245–0.953)	0.036	1.346 (0.533–3.400)	0.529
Mild anxiety/No anxiety	1.302 (0.718–2.363)	0.384	2.489 (1.089–5.691)	0.031
Post-reimbursement medical expenses, yuan				
≥ 20,000/< 1000	5.931 (1.814–19.392)	0.003	3.927 (0.878–17.559)	0.073
5000–20,000/< 1000	0.685 (0.328–1.429)	0.313	1.222 (0.454–3.291)	0.691
1000–5000/< 1000	0.551 (0.288–1.057)	0.073	0.778 (0.325–1.865)	0.574
Travel time to nearest tertiary hospital				
≥ 30 minutes/< 10 minutes	0.654 (0.266–1.608)	0.355	0.283 (0.101–0.795)	0.017
10–30 minutes/< 10 minutes	1.152 (0.465–2.852)	0.759	0.374 (0.133–1.050)	0.062

no multicollinearity concerns. Patients were more likely to choose tertiary hospitals if they had undergone surgical treatment (OR = 3.192, 95% CI: 1.557–6.541), reported negative or neutral emotional responses to symptoms (OR = 2.835, 95% CI: 1.569–5.123; OR = 2.191, 95% CI: 1.095–4.385), or incurred high post-reimbursement costs (>20,000 yuan; OR = 5.931, 95% CI: 1.814–19.392). Patients were more likely to choose community hospitals if they had mild anxiety symptoms (OR = 2.489, 95% CI: 1.089–5.691).

Patients were more likely to select secondary hospitals if they had a BPH diagnosis (OR = 0.417, 95% CI: 0.219–0.794), rural residence (OR = 0.264, 95% CI: 0.160–0.436), moderate pain (OR = 0.503, 95% CI: 0.277–0.913), moderate anxiety (OR = 0.483, 95% CI: 0.245–0.953), fewer chronic conditions (≤1; OR = 0.570, 95% CI: 0.333–0.974), recent routine physical exams (OR = 0.333, 95% CI: 0.159–0.698), or maintained moderate- or high-intensity exercise (OR = 0.399 and 0.206, respectively). In addition, symptom duration of 3–12 months (OR = 0.353, 95% CI: 0.165–0.754) and frequent recent symptoms (OR = 0.263, 95% CI: 0.111–0.620) were also associated with preference for secondary hospitals. Compared with patients with illness duration <3 months, those with 3–12 months (OR = 0.353, 95% CI: 0.165–0.754) or longer travel time to the nearest tertiary hospital (>30 minutes; OR = 0.283, 95% CI: 0.101–0.795) were also less likely to choose community facilities.

Visual Summary of Facility Selection Patterns

To enhance interpretability, visual analyses were conducted. The radar chart (Figure 2) illustrated the magnitude of each determinant's influence on facility selection. Tertiary hospital choice was driven by clinical intensity (eg, surgery treatment,

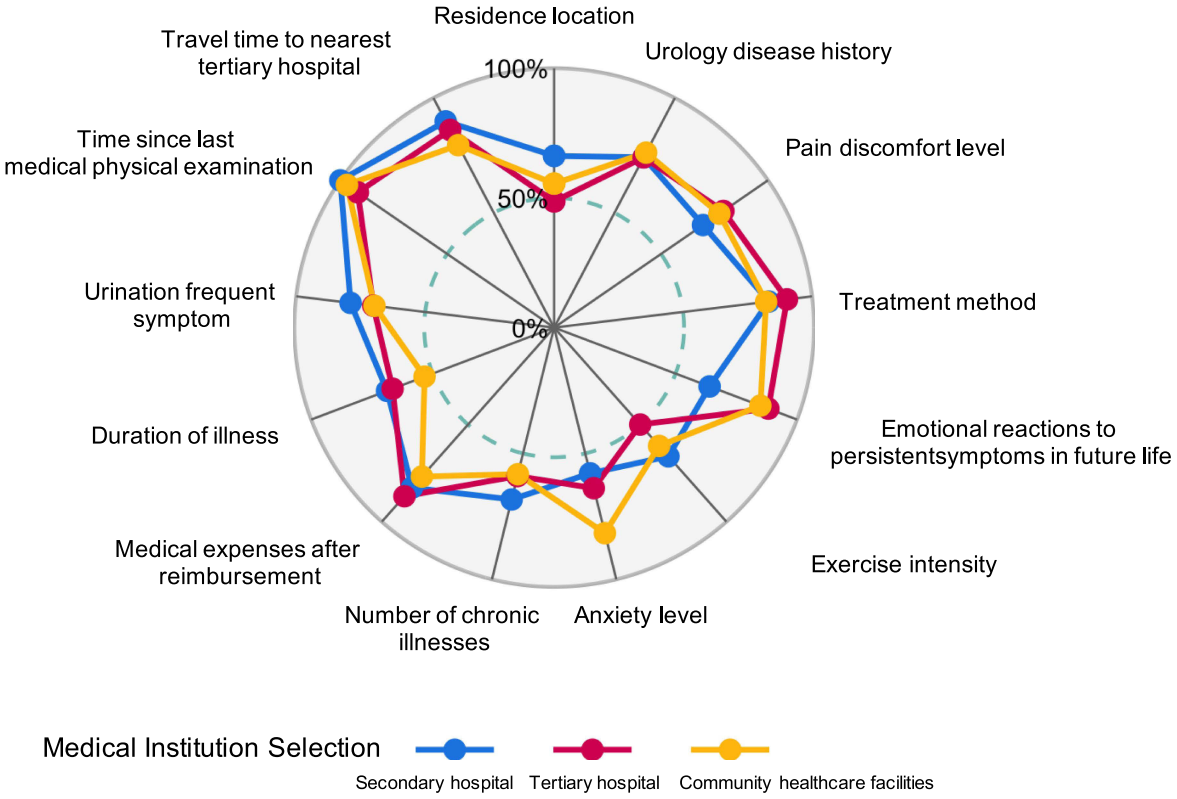

Figure 2 Radar Chart Illustrating Distinctive Patterns Across Healthcare Tiers.

emotional response to symptoms, financial cost), Community care was associated with psychological and behavioral simplicity, Secondary hospital selection was linked to moderate clinical needs and demographic factors like rural residence.

To visually illustrate the patient-level determinants influencing hospital choice, a Sankey diagram was constructed based on the significant predictors identified in the multinomial logistic regression model (Figure 3). Patients who ultimately sought care at tertiary hospitals were predominantly characterized by having undergone surgical treatment, experienced severe pain, and reported negative emotional reactions to persistent symptoms. These individuals were also more likely to incur high post-reimbursement medical expenses and face longer travel times to reach a tertiary hospital, suggesting that they were willing to overcome logistical and financial barriers to access what they perceived as higher-quality, specialist care.

In contrast, those choosing secondary hospitals exhibited a relatively moderate clinical burden. These patients tended to report moderate pain, engage in moderate levels of physical activity, and have undergone routine health checkups within the past six months. Clinically, they were more likely to present with BPH and illness durations ranging from three to twelve months. Their overall health status was relatively stable, often involving ≤1 chronic conditions, and they commonly reported moderate levels of anxiety. This pattern suggests that secondary hospitals may serve as an optimal middle ground, offering patients both access to specialized care and shorter waiting times compared to tertiary centers.

Meanwhile, the flow of patients toward community healthcare facilities was shaped by a different set of factors. These individuals were more likely to report high-intensity physical activity, mild anxiety symptoms, and shorter illness durations. They typically incurred low medical expenses and lived closer to tertiary hospitals, which indirectly reflects their geographic proximity to urban areas where community services are more developed. This group's profile aligns with a pattern of seeking quick, convenient care for self-limited or mild conditions.

Overall, these diagrams highlight the multidimensional decision pathways underlying patient choices. It underscores the fact that healthcare-seeking behavior is not driven by a single dominant factor but by an interplay of clinical severity, emotional state, lifestyle behavior, financial burden, and access logistics.

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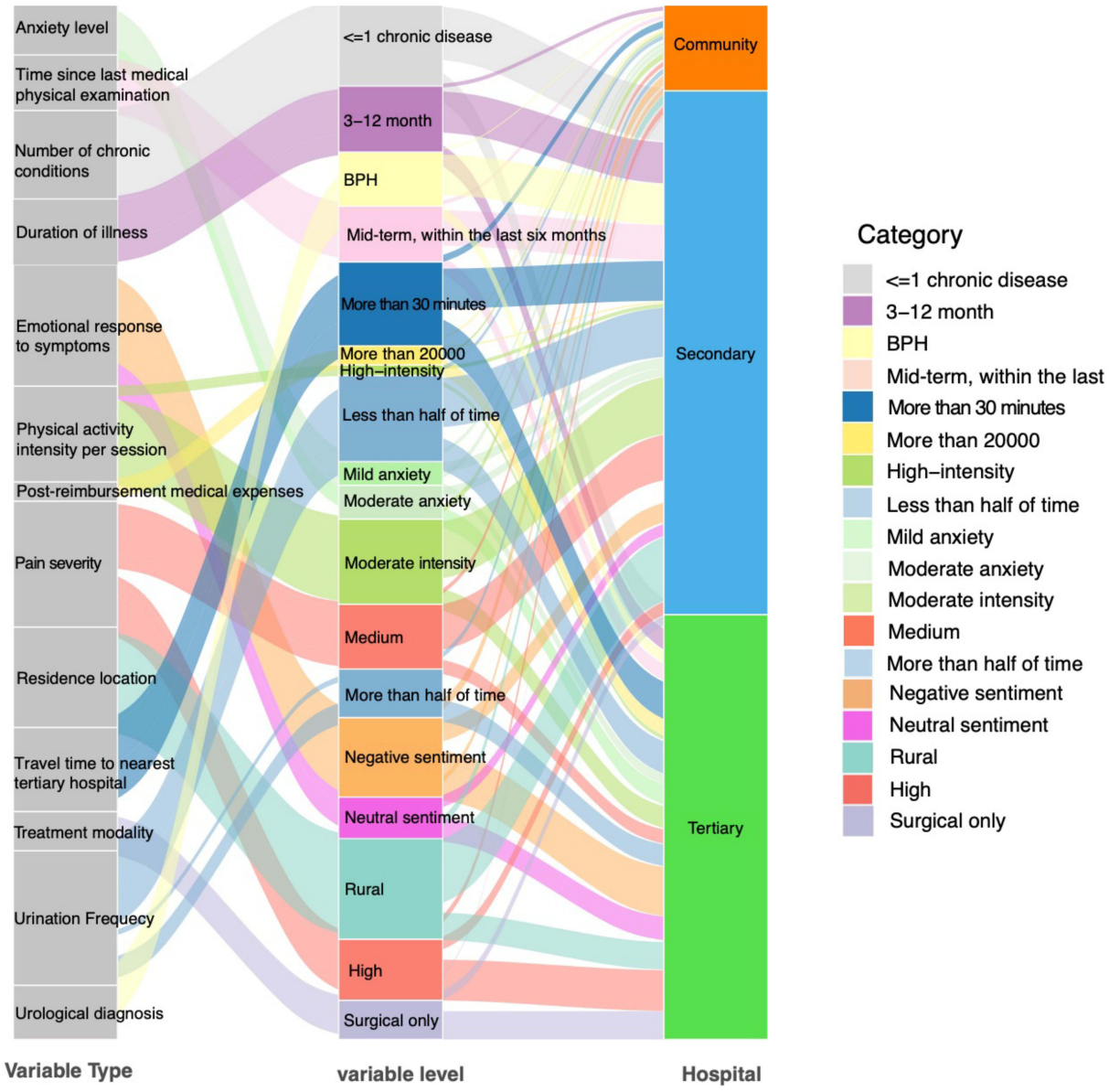

Figure 3 Sankey Diagram Depicting Patient-Level Determinants of Hospital Selection.

Multiple Correspondence Analysis Results

MCA identified two dominant dimensions explaining a cumulative 19.3% of total variance (Figure 4). Based on clustering patterns: Community healthcare users were characterized by high intensity physical activity, shorter symptom duration (less than 3 months), severe anxiety, lower financial burden (< 1000 yuan), and proximity to the facility (less than 10 minutes). Secondary hospital users tended to reside in rural areas, experience medium pain discomfort, have BPH, symptoms lasting 3–12 months, and engaged in moderate physical activity. Tertiary hospital users were more likely to have multiple chronic conditions (2 or more), surgical treatment, negative emotional responses, low physical activity, and higher financial burden (> 20,000 yuan). These profiles mirrored the regression outcomes and added structural insight into patient typologies.

Thematic Dimensions Underlying Facility Selection

Dimension analysis extracted four core themes influencing hospital preference professional expertise (Figure 5A), consultation time (Figure 5B), hospital characteristics (Figure 5C), and family support (Figure 5D). Professional expertise was

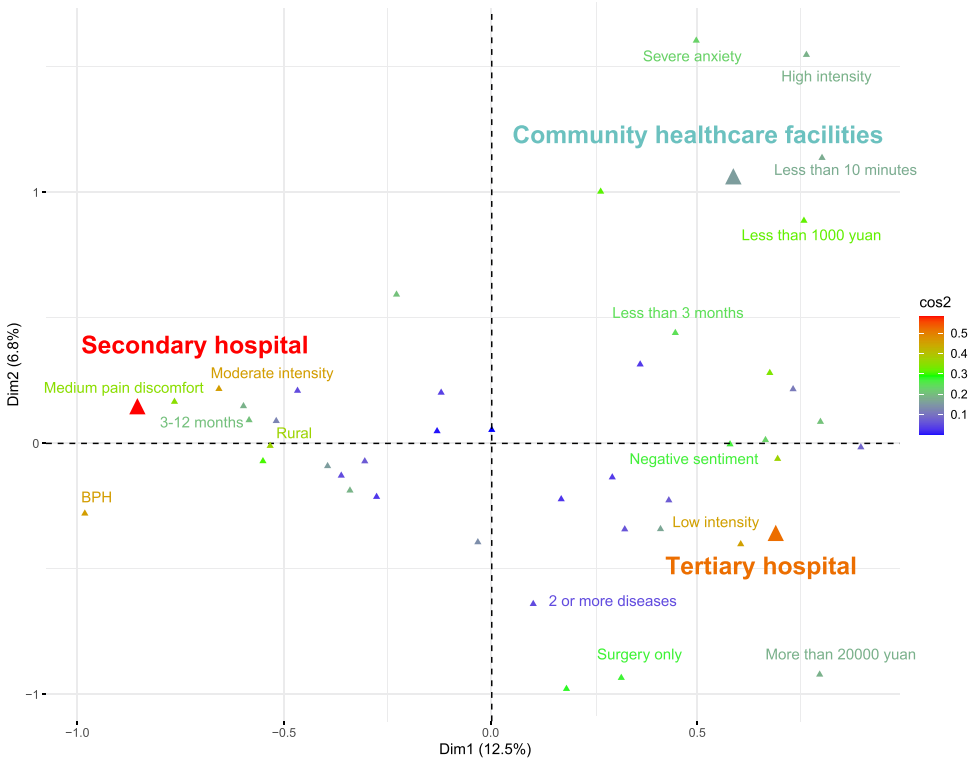

Figure 4 Multiple Correspondence Analysis of Hospital Selection Patterns.

the dominant driver for tertiary hospital selection, whereas consultation time-particularly transportation and medication waiting times-was crucial for community facilities. Hospital characteristics, including reputation, qualifications, and overall environment, were prioritized by tertiary hospital patients, while price reasonability was consistently considered across all tiers. Facility completeness and sanitation were valued particularly in community and tertiary hospitals. In terms of family support, psychological assistance and accompaniment were important for both tertiary and community hospitals, whereas financial support and family diagnostic abilities exerted minimal influence. These themes highlight that patients weigh not only clinical needs but also logistical, experiential, and relational factors when choosing care.

Discussion

This study provides a comprehensive, multi-dimensional analysis of healthcare-seeking behavior among urological patients, revealing that hospital selection is not solely based on clinical needs but shaped by an interplay of psychosocial, economic, and behavioral determinants. While disease severity and treatment requirements remain foundational, factors such as psychological distress, preventive behavior, geographic access, and health-related cost perception significantly influence patient decision-making. These findings offer both theoretical insight into patient behavior and practical implications for the improvement of hierarchical healthcare delivery in China.

Patient Profiles and Demographic Determinants

Our MCA results identified clearly segmented patient profiles aligned with healthcare facility choice. Individuals selecting community healthcare facilities tended to live within walking distance, exhibited high physical activity intensity, and incurred low healthcare costs-demonstrating a preference for efficiency, convenience, and self-managed care. These findings align with the "low-acuity, high-frequency" user profile often seen in primary care utilization, where care decisions are driven more by logistical than clinical factors.[34–36]

By contrast, rural residents, patients with BPH, and those with moderate chronic disease burdens predominantly utilized secondary hospitals. These choices likely reflect not only disease characteristics, but also the relative strength of

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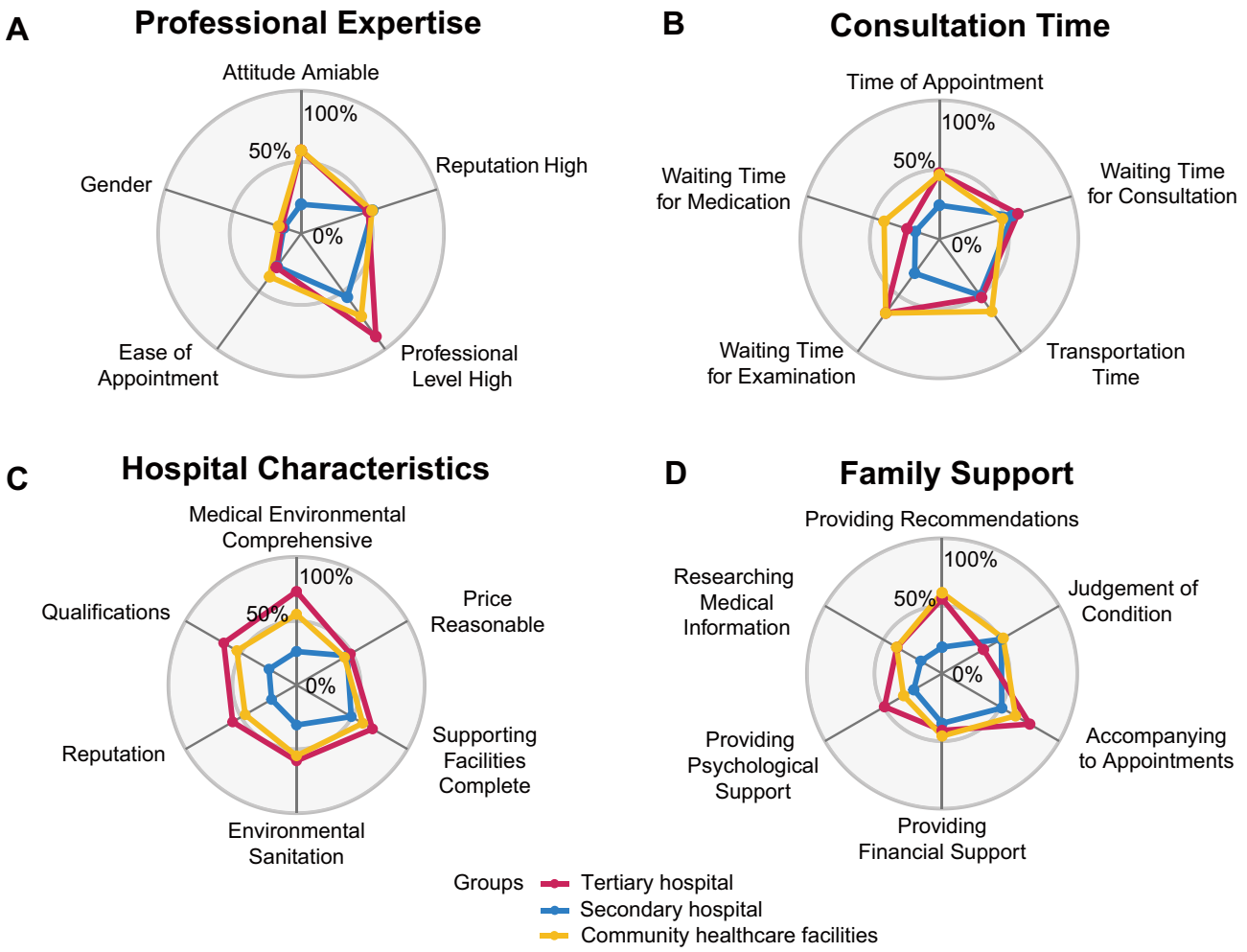

Figure 5 Radar Plots of Key Patient Priorities in Hospital Selection Across Four Thematic Dimensions: (**A**) Professional Expertise, (**B**) Time Efficiency, (**C**) Facility Characteristics, and (**D**) Family Support.

secondary-level urology services and the perceived inefficiencies in tertiary settings, such as long wait times and over-specialization.[37,38] Moreover, Chinese patients' traditional pattern of "self-assessment and self-referral" often bypasses the primary system, especially when illness duration exceeds several months, further reinforcing this bifurcation.[39]

Clinical Burden and Healthcare System Navigation

The relationship between disease severity and facility selection presents a nuanced spectrum. Patients with acute symptoms such as pain preferred secondary hospitals, likely due to an optimal balance between access speed and perceived medical competence.[40] Community healthcare centers, while convenient, lacked sufficient clinical depth for acute symptom management. In contrast, patients with chronic, treatment-resistant symptoms, especially those requiring surgery, gravitated toward tertiary hospitals, demonstrating the role of perceived expertise, comprehensive diagnostic capacity, and procedural availability in decision-making.[9,41] Additionally, access to medications was an implicit factor, with tertiary hospitals offering broader pharmaceutical formularies and greater treatment continuity, especially relevant for long-term urological disorders.[42,43]

Psychological Factors: Anxiety and Perceived Risk

This study reaffirms the behavioral economics perspective that healthcare choices are not purely rational but emotion-laden.[44,45] Anxiety emerged as a key variable, mild anxiety prompted visits to community centers for reassurance and

immediacy, while moderate anxiety shifted preferences toward secondary hospitals, seen as a "safe compromise" between resource access and complexity.[2,46]

This risk-avoidant behavior reflects a deeper psychological mechanism: as uncertainty increases, patients are more likely to overestimate the value of high-tier hospitals, regardless of medical necessity.[10,47] This has implications for health communication strategies-improving patient confidence in community-based care may relieve unnecessary tertiary-level demand.

Cost, Coverage, and Geographic Access

Financial and spatial access remained central to patients' decisions.[48,49] As expected, tertiary hospitals were associated with higher post-reimbursement medical expenses, acting as a barrier for many, yet still attracting patients with urgent needs.[47] The cost-effectiveness of secondary hospitals and the reimbursement advantages of community clinics did impact patient flow but did not fully offset behavioral or cultural biases toward higher-level care.[1,50,51]

This reflects a systemic gap: while China's hierarchical system is structurally sound, financial incentives alone have not sufficiently realigned patient behavior.[52] Moreover, our findings show that geographic proximity alone does not determine facility use-patients near community clinics still bypass them, indicating that perceived quality and trustworthiness remain decisive.

Institutional Trust, Health Literacy, and Strategic Reform

Our findings indicate that professional medical expertise and perceived institutional trust-not family advice or cost considerations-were primary drivers in hospital selection.[53,54] This aligns with evidence that strong doctor-patient relationships, built through consistent communication and clinical credibility, drive care satisfaction and adherence.[55,56]

However, health information asymmetry persists. Patients' decisions are often shaped by access to diagnostic knowledge, online information literacy, and social networks. This underlines the need for targeted health education, especially in rural and low-income populations, to bridge gaps in understanding and reduce inappropriate tertiary care utilization.[57] Equally important, community facilities must go beyond basic services and actively build perceived value-through standardization, public transparency, and training investments.[58] In the absence of trust, structural reform alone cannot correct behavioral inertia.

Interpreting Healthcare Choice Through Andersen's Behavioral Model

Although our study was not explicitly structured around Andersen's Behavioral Model, its core domains offer a valuable lens to interpret the complex determinants of hospital choice.[16,17] Predisposing factors, such as age, education, and rural residence location, influenced perceived suitability of different care levels. For example, rural patients and those with lower education were more likely to choose secondary hospitals, possibly due to habitual patterns or limited health literacy. Enabling resources, including income, insurance, and travel time, also shaped decisions, though not always predictably; many patients bypassed nearby community clinics in favor of higher-level institutions, underscoring the role of perceived quality over convenience. Need factors, both evaluated (eg, diagnosis, surgery) and perceived (eg, anxiety, symptom burden), were particularly influential. Moderate anxiety was associated with secondary care use, while more severe or persistent symptoms drove tertiary hospital selection, even at higher financial cost. Thus, the model served not as a strict template, but as a conceptual guide for contextualizing patients' healthcare choices.

Policy Implications

This study offers actionable insights for tiered care optimization and demand-side reform: Tertiary hospitals should consolidate their role in complex care by investing in sub-specialization and post-operative continuity. Secondary hospitals should be promoted as core anchors in chronic disease management through expanded diagnostics, reduced wait times, and professional outreach. Community clinics require public investment in clinical credibility, digital health tools, and emotional support services, especially for anxiety-prone populations. Policymakers must reframe financial levers to include non-monetary incentives: health education campaigns, triage navigation apps, and patient empowerment

models. Finally, trust-building and literacy improvement should be treated as central pillars of health system reform-not merely as behavioral side notes.

International Comparison: Cross-Country Parallels and Divergences

Although China's hierarchical system operates within a unique institutional and cultural context, similar healthcare-seeking behaviors are observed globally. For example, in South Korea, psychological reassurance significantly influences hospital selection, aligning with our observation that anxiety levels play a critical role in patients' decisions between facility types.[59] Likewise, patients in Japan often prefer tertiary institutions based on perceptions of superior expertise and procedural efficiency, despite having access to local care options.[19] Countries like the UK and the Netherlands have implemented effective gatekeeping systems led by general practitioners, supported by mandatory referrals and continuity-of-care frameworks.[18,20] These mechanisms successfully contain unnecessary tertiary care utilization by fostering trust in primary-level services.[60,61]

These international comparisons suggest that emotional factors, institutional trust, and access dynamics are universally influential-but their impact depends heavily on how well system design aligns with behavioral drivers. China may benefit from selectively adopting international practices such as digital triage tools, mandatory referral pathways, and primary care quality transparency-while remaining sensitive to its own systemic and cultural constraints.

Comparison with Prior Literature

Previous studies have highlighted the psychological and behavioral dimensions of hospital selection in China. For instance, Tang et al identified anxiety as a key factor behind tertiary hospital preference-a pattern consistent with our findings among urological patients experiencing emotional distress.[10] Yu et al emphasized institutional distrust and misconceptions about primary care as major barriers, which we similarly observed in patients bypassing community facilities.[62] Sun et al further argued that behavioral alignment is essential for the success of structural reforms like the HDT system.[63]

Our study extends the existing literature in several important ways. First, we simultaneously analyzed behavioral, clinical, and socioeconomic variables within an integrated quantitative framework, offering a more holistic understanding of healthcare-seeking behavior. Second, we used visual tools (eg, Sankey diagrams, MCA) to map patient flow across different care levels-an innovative approach rarely applied to China's HDT system. Finally, our use of Andersen's model as a conceptual scaffold allowed us to systematically interpret the dynamic interaction between patient characteristics and institutional factors.

Study Limitations

This study has several limitations. First, it was conducted in Jiangsu Province, which may limit generalizability to less-developed regions. Second, the cross-sectional design prevents causal inference. Third, all psychological and behavioral data were self-reported, raising the possibility of recall or social desirability bias. In addition, the use of both online and in-person surveys may have introduced mode-related response differences, particularly for subjective measures, despite standardized procedures. Fourth, the sample included fewer female participants (23.4%), reflecting the sex distribution of urological patients; however, this may limit the generalizability of sex-specific findings. Lastly, the focus on urological conditions may limit applicability to other disease contexts.

Conclusion

This study demonstrates that hospital selection among urological patients is influenced by a combination of clinical needs, emotional responses, lifestyle behaviors, and system-level conditions. Among the 676 respondents, 46.0% selected tertiary hospitals, 44.1% chose secondary hospitals, and 9.9% sought care at community healthcare facilities, reflecting a persistent imbalance in service use. Multinomial regression revealed that prior surgery (OR = 3.192), high post-reimbursement costs (OR = 5.931), and negative emotional responses significantly predicted tertiary hospital use. In contrast, mild anxiety (OR = 2.489) and geographic proximity were associated with choosing community facilities. These findings align with Andersen's Behavioral Model, illustrating how predisposing characteristics, enabling resources, and perceived needs jointly influence service utilization.

In the context of China's HDT system, structural design alone is insufficient without addressing behavioral drivers. Building trust in primary care, reducing perceived access barriers, and improving public health messaging are critical to aligning patient behavior with policy goals. Integrating behavioral insights into health system planning may enhance efficiency, reduce tertiary overuse, and promote more equitable access to appropriate levels of care.

For practitioners, this study underscores the importance of considering not only clinical indicators but also patients' psychological and socioeconomic contexts. Primary care providers and hospital staff can use these insights to identify patients at risk of bypassing local care due to anxiety, mistrust, or perceived inadequacy, and respond with tailored reassurance, improved communication, and referral support. Health educators and community physicians can strengthen patient trust through targeted outreach and myth-busting public messaging. Future research should examine these behavioral patterns in other specialties and less-developed regions to assess generalizability. Longitudinal studies are needed to clarify causal relationships between psychosocial factors and hospital choice, while qualitative research could further uncover patient narratives and decision logic, enriching the behavioral evidence base.

Ethics Approval and Informed Consent

The study protocol received ethical approval from Xuzhou Medical University (XZHMU-2024Z021) and adhered to the principles outlined in the Declaration of Helsinki.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no potential conflicts of interest in this work.

References

1. Li D, Yamada M, Gao D, Yang F, Nie H. Spatial variations in health service utilization among migrant population: a perspective on health equity. *Front Public Health*. 2024;12:1447723. doi:10.3389/fpubh.2024.1447723
2. Zhang X, Dai J, Li W, et al. Community medical service construction: identifying factors that influence medical choice for patients with non-communicable chronic diseases in the Southwest China. *BMC Public Health*. 2024;24(1):1353. doi:10.1186/s12889-024-18789-z
3. Collaborators GBPH, Han H, Abbasi B. The global, regional, and national burden of benign prostatic hyperplasia in 204 countries and territories from 2000 to 2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Healthy Longev*. 2022;3(11):e754–e776. doi:10.1016/S2666-7568(22)00213-6
4. Wang YB, Yang L, Deng YQ, et al. Causal relationship between obesity, lifestyle factors and risk of benign prostatic hyperplasia: a univariable and multivariable Mendelian randomization study. *J Transl Med*. 2022;20(1):495. doi:10.1186/s12967-022-03722-y
5. Coyne KS, Wein AJ, Tubaro A, et al. The burden of lower urinary tract symptoms: evaluating the effect of LUTS on health-related quality of life, anxiety and depression: epiLUTS. *BJU Int*. 2009;103(Suppl 3):4–11. doi:10.1111/j.1464-410X.2009.08371.x
6. GBD 2019 Ageing Collaborators. Global, regional, and national burden of diseases and injuries for adults 70 years and older: systematic analysis for the Global Burden of Disease 2019 Study. *BMJ*. 2022;376:e068208. doi:10.1136/bmj-2021-068208
7. Huang J, Chan CK, Yee S, et al. Global burden and temporal trends of lower urinary tract symptoms: a systematic review and meta-analysis. *Prostate Cancer Prostatic Dis*. 2023;26(2):421–428. doi:10.1038/s41391-022-00610-w
8. Zhao X, Xiao J, Chen H, et al. Patient preferences and attitudes towards first choice medical services in Shenzhen, China: a cross-sectional study. *BMJ Open*. 2022;12(5):e057280. doi:10.1136/bmjopen-2021-057280

9. Guo L, Du X, Wu H, et al. Factors associated with patients' healthcare-seeking behavior and related clinical outcomes under China's hierarchical healthcare delivery system. *Front Public Health*. 2024;12:1326272. doi:10.3389/fpubh.2024.1326272
10. Tang L. The patient's anxiety before seeing a doctor and her/his hospital choice behavior in China. *BMC Public Health*. 2012;12(1):1121. doi:10.1186/1471-2458-12-1121
11. Li L, Tian M. The Mechanism of Doctor–Patient Trust in the Hierarchical Diagnosis and Treatment System (HDTS) From the Perspective of Tripartite Evolutionary Game. *Health Soc Care Community*. 2024;2024(1):1117941. doi:10.1155/hsc/1117941
12. Song Y, Wu M, Feng H. Influencing factors of patients' behavior of healthcare seeking: a meta-analysis in China. *Front Public Health*. 2025;13:1583075. doi:10.3389/fpubh.2025.1583075
13. Cui C, Zuo X, Wang Y, Song H, Shi J, Meng K. A comparative study of patients' satisfaction with different levels of hospitals in Beijing: why do patients prefer high-level hospitals? *BMC Health Serv Res*. 2020;20(1):643. doi:10.1186/s12913-020-05507-9
14. Tang C, Fang P, Bai X, Min R, Liu C. Patient experience in community health services and first choice for medical attention: a cross-sectional study in Wuhan, China. *PLoS One*. 2023;18(7):e0288164. doi:10.1371/journal.pone.0288164
15. Liang C, Zhao Y, Yu C, Sang P, Yang L. Hierarchical medical system and local medical performance: a quasi-natural experiment evaluation in Shanghai, China. *Front Public Health*. 2022;10:904384. doi:10.3389/fpubh.2022.904384
16. Andersen RM. National health surveys and the behavioral model of health services use. *Med Care*. 2008;46(7):647–653. doi:10.1097/MLR.0b013e31817a835d
17. Bradley EH, McGraw SA, Curry L, et al. Expanding the Andersen model: the role of psychosocial factors in long-term care use. *Health Serv Res*. 2002;37(5):1221–1242. doi:10.1111/1475-6773.01053
18. Forrest CB. Primary care in the United States: primary care gatekeeping and referrals: effective filter or failed experiment? *BMJ*. 2003;326(7391):692–695. doi:10.1136/bmj.326.7391.692
19. Hashimoto H, Ikegami N, Shibuya K, et al. Cost containment and quality of care in Japan: is there a trade-off? *Lancet*. 2011;378(9797):1174–1182. doi:10.1016/S0140-6736(11)60987-2
20. Weghorst AAH, Sanci LA, Berger MY, Hiscock H, Jansen D. Comparing healthcare systems between the Netherlands and Australia in management for children with acute gastroenteritis. *PLoS One*. 2024;19(7):e0306739. doi:10.1371/journal.pone.0306739
21. Rotenberg DK, Stewart-Freedman B, Søgaard J, Vinker S, Lahad A, Søndergaard J. Similarities and differences between two well-performing healthcare systems: a comparison between the Israeli and the Danish healthcare systems. *Isr J Health Policy Res*. 2022;11(1):14. doi:10.1186/s13584-022-00524-x
22. Witter S, Sheikh K, Schleiff M. Learning health systems in low-income and middle-income countries: exploring evidence and expert insights. *BMJ Glob Health*. 2022;7(Suppl 7):e008115. doi:10.1136/bmjgh-2021-008115
23. Ye Z, Wang J, Xiao Y, Luo J, Xu L, Chen Z. Global burden of benign prostatic hyperplasia in males aged 60–90 years from 1990 to 2019: results from the global burden of disease study 2019. *BMC Urology*. 2024;24(1):1–15. doi:10.1186/s12894-024-01582-w
24. Lwanga SK, Lemeshow S, World Health Organisation. Sample size determination in health studies: a practical manual. 1991. Available from: https://iris.who.int/handle/10665/40062. Accessed Dec 23, 2025.
25. Raza Z, Ul Haq MB, Imtiaz T, Khokhar MA, Inam A. Short-term outcome of metabolic surgery versus intensive medical therapy among obese type 2 diabetics: a quasi-experimental study. *J Pak Med Assoc*. 2025;75(2):186–191. doi:10.47391/JPMA.10425
26. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995;36(1):1–10. doi:10.2307/2137284
27. Liu Y, Kong Q, Yuan S, van de Klundert J. Factors influencing choice of health system access level in China: a systematic review. *PLoS One*. 2018;13(8):e0201887. doi:10.1371/journal.pone.0201887
28. Bastien CH, Vallières A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med*. 2001;2(4):297–307. doi:10.1016/S1389-9457(00)00065-4
29. Emert SE, Dietch JR, Bramoweth AD, Kelly K, Taylor DJ. Psychometric Evaluation of the Insomnia Severity Index in U.S. College Students. *Behav Ther*. 2024;55(5):990–1003. doi:10.1016/j.beth.2024.02.003
30. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10):1092–1097. doi:10.1001/archinte.166.10.1092
31. Niwenahisemo LC, Zhang Q, Wang W, et al. A comparative study of anxiety symptoms in Chinese and Rwandan adolescents: a cross-cultural measurement invariance study of the GAD-7 scale. *Front Psychiatry*. 2025;16:1571753. doi:10.3389/fpsyt.2025.1571753
32. Florensa D, Godoy P, Mateo J, et al. The Use of Multiple Correspondence Analysis to Explore Associations Between Categories of Qualitative Variables and Cancer Incidence. *IEEE J Biomed Health Inform*. 2021;25(9):3659–3667. doi:10.1109/JBHI.2021.3073605
33. Rasmussen A, Dawkins BA, Li C, et al. Multiple Correspondence Analysis and HLA-Associations of Organ Involvement in a Large Cohort of African-American and European-American Patients with Sarcoidosis. *Lung*. 2023;201(3):297–302. doi:10.1007/s00408-023-00626-6
34. Bruni ML, Ugolini C, Verzulli R. Should I wait or should I go? Travelling versus waiting for better healthcare. *Regional Science and Urban Economics*. 2021;62:103697. doi:10.1016/j.regsciurbeco.2021.103697
35. Basu S, Phillips RS. Reduced Emergency Department Utilization after Increased Access to Primary Care. *PLoS Med*. 2016;13(9):e1002114. doi:10.1371/journal.pmed.1002114
36. Sancton K, Sloss L, Berkowitz J, Strydom N, McCracken R. Low-acuity presentations to the emergency department: reasons for and access to other health care providers before presentation. *Can Fam Physician*. 2018;64(8):e354–e360.
37. Luo D, Zhu X, Zhao J, Li X, Du Y, Du Y. Healthcare preferences of chronic disease patients under China's hierarchical medical system: an empirical study of Tianjin's reform practice. *Sci Rep*. 2024;14(1):11631. doi:10.1038/s41598-024-62118-8
38. Ruan Y, Yu M. The mismatch in hierarchical diagnosis and treatment construction and related reasons: a qualitative analysis from ZX City, Hubei Province. *Front Public Health*. 2025;13:1524732. doi:10.3389/fpubh.2025.1524732
39. Xie W, Liu J, Huang Y, Xi X. Capturing What Matters with Patients' Bypass Behavior? Evidence from a Cross-Sectional Study in China. *Patient Prefer Adherence*. 2023;17:591–604. doi:10.2147/PPA.S395928
40. Yan N, Liu T, Xu Y, et al. Healthcare preferences of the general Chinese population in the hierarchical medical system: a discrete choice experiment. *Front Public Health*. 2022;10:1044550. doi:10.3389/fpubh.2022.1044550

41. Chughtai B, Rojanasarot S, Neeser K, Gultyaev D, Amorosi SL, Shore ND. Cost-Effectiveness and Budget Impact of Emerging Minimally Invasive Surgical Treatments for Benign Prostatic Hyperplasia. *J Health Econ Outcomes Res*. 2021;8(1):42–50. doi:10.36469/jheor.2021.22256
42. Lin Y, Zhang G, Fu H. Public satisfaction and trust towards the health system in China and associated factors: a mixed-methods study. *BMC Public Health*. 2025;25(1):3339. doi:10.1186/s12889-025-24612-0
43. Peng N, Du C, Gong Y, Long X, Wang C, Liu P. Systematic review of the impact of the National Medication Price Negotiated Policy on the accessibility of drugs in China, 2016–2024. *BMJ Open*. 2024;14(12):e087190. doi:10.1136/bmjopen-2024-087190
44. Heerema R, Pessiglione M. How mood-related physiological states bias economic decisions. *Commun Psychol*. 2025;3(1):55. doi:10.1038/s44271-025-00241-6
45. Volpp KG, Asch DA. Make the healthy choice the easy choice: using behavioral economics to advance a culture of health. *Qjm*. 2017;110(5):271–275. doi:10.1093/qjmed/hcw190
46. Kozlowski D, Hutchinson M, Hurley J, Rowley J, Sutherland J. The role of emotion in clinical decision making: an integrative literature review. *BMC Med Educ*. 2017;17(1):255. doi:10.1186/s12909-017-1089-7
47. Shi J, Chen N, Liu N, et al. Options for Care of Elderly Inpatients With Chronic Diseases: analysis of Distribution and Factors Influencing Use of Care in Shanghai, China. *Front Public Health*. 2021;9:631189. doi:10.3389/fpubh.2021.631189
48. Domapielle MK, Dassah C, Dordaa F, Cheabu BSN, Sulemana M. Barriers to health care access and utilization among aged indigents under the Livelihood Empowerment Against Poverty Programme (LEAP): the perspective of users and service providers in north-western Ghana. *Prim Health Care Res Dev*. 2023;24:e48. doi:10.1017/S1463423623000385
49. Mseke EP, Jessup B, Barnett T. Impact of distance and/or travel time on healthcare service access in rural and remote areas: a scoping review. *Journal of Transport & Health*. 2024;37:101819. doi:10.1016/j.jth.2024.101819
50. van de Pol JM, van Dijk L, Koster ES, de Jong J, Bouvy ML. How does the general public balance convenience and cognitive pharmaceutical services in community pharmacy practice. *Res Social Adm Pharm*. 2021;17(3):606–612. doi:10.1016/j.sapharm.2020.05.014
51. Fu L, Han J, Xu K, Pei T, Zhang R. Incentivizing primary care utilization in China: the impact of health insurance coverage on health-seeking behaviour. *Health Promotion Int*. 2024;39(5). doi:10.1093/heapro/daae115
52. Cao N, Li X, Jiang J, Xu W. The effect of basic medical insurance on the changes of primary care seeking behavior: an application of hierarchical age-period-cohort analysis. *Front Public Health*. 2022;10:929896. doi:10.3389/fpubh.2022.929896
53. Li L, Zhu L, Zhou X, et al. Patients' trust and associated factors among primary care institutions in China: a cross-sectional study. *BMC Prim Care*. 2022;23(1):109. doi:10.1186/s12875-022-01709-8
54. Blödt S, Müller-Nordhorn J, Seifert G, Holmberg C. Trust, medical expertise and humaneness: a qualitative study on people with cancer' satisfaction with medical care. *Health Expect*. 2021;24(2):317–326. doi:10.1111/hex.13171
55. Lerch SP, Hänggi R, Bussmann Y, Lörwald A. A model of contributors to a trusting patient-physician relationship: a critical review using a systematic search strategy. *BMC Prim Care*. 2024;25(1):194. doi:10.1186/s12875-024-02435-z
56. Zhang X, Li L, Zhang Q, Le LH, Wu Y. Physician Empathy in Doctor-Patient Communication: a Systematic Review. *Health Commun*. 2024;39(5):1027–1037. doi:10.1080/10410236.2023.2201735
57. Wang D, Liu Z, Liu Y, et al. Knowledge, attitudes, and practices among patients with diabetes mellitus and hyperuricemia toward disease self-management. *Front Public Health*. 2024;12:1426259. doi:10.3389/fpubh.2024.1426259
58. Zhong C, Huang J, Li L, et al. Relationship between patient-perceived quality of primary care and self-reported hospital utilisation in China: a cross-sectional study. *Eur J Gen Pract*. 2024;30(1):2308740. doi:10.1080/13814788.2024.2308740
59. Yu SY, Suh EE, Lim S, Kim JY. An Exploratory Study of Ideal Medical Systems Based on the Experiences of Laypeople in South Korea. *SAGE Open*. 2024;14(4). doi:10.1177/21582440241304578
60. Bonciani M, Schäfer W, Barsanti S, Heinemann S, Groenewegen PP. The benefits of co-location in primary care practices: the perspectives of general practitioners and patients in 34 countries. *BMC Health Serv Res*. 2018;18(1):132. doi:10.1186/s12913-018-2913-4
61. Wu S, Lei Z, Liu T, Chen L, Qin Y. The analysis of factors influencing patient choice of healthcare providers between tertiary hospitals and community clinics. *Front Public Health*. 2025;13:1510311. doi:10.3389/fpubh.2025.1510311
62. Yu M, Yang Z, Jiang C, Shi L. Relationship between outpatients' sociodemographic and belief characteristics and their healthcare-seeking behavioral decision-making: evidence from Jiaxing city, China. *PLoS One*. 2022;17(6):e0270340. doi:10.1371/journal.pone.0270340
63. Sun Z, Wang S, Zhao H, Zhou X, Zhang L, Shi J. Does descending health resources reform impact patient low-level hospital selection behavior? Evidence from Zhejiang, China. *Arch Public Health*. 2021;79(1):179. doi:10.1186/s13690-021-00700-6