

Urban-Rural Differences in Public Sports Service Demands Among Older Adults and Their Fulfillment Paths: An Empirical Study of Shaanxi Province

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Abstract: To optimize public sports service allocation for older adults under the “Healthy China” initiative, this study investigated urban-rural demand disparities in Shaanxi Province. Surveying 600 older adults, we analyzed sports participation, service demands, satisfaction, and supply-demand matching using Chi-square tests, independent samples t-tests, binary Logistic regression, and the IPA model. Results revealed: (1) A significant urban-rural sports participation gap; urban regular exercise rates (69.83%) substantially exceeded rural rates (27.12%), with urban-rural attributes independently driving exercise behavior ($\text{Exp}(B)=2.000$, $P<0.05$). (2) Highly polarized demands; rural adults focused on basic venues and collective activities, whereas urban adults favored high-level services like scientific lectures and professional guidance. (3) A structural supply mismatch emphasizing hardware over soft services, with professional guidance and normalized activities emerging as core shortcomings. (4) Significantly higher overall satisfaction in urban ($M=4.05$) than rural areas ($M=3.46$). Consequently, this study constructs differentiated strategies: a quality-enhancement path integrating sports and medicine for urban areas, and a baseline-guarantee path upgrading micro-spaces and empowering grassroots leaders for rural areas. Finally, a data-driven financial assessment mechanism is proposed to advance service equalization.

Keywords: Active Aging; Public Sports Services; Urban-Rural Differences; Fulfillment Paths

1. Introduction

Population aging has become a long-term basic national condition in China. As a crucial driver of healthy aging, public sports services for older adults play a pivotal role in reducing disability

rates, delaying the progression of chronic diseases, and alleviating the burden on the medical care system [1]. The degree of aging in Shaanxi Province exceeds the national average, with the population aged 60 and above accounting for 19.2%. Meanwhile, its urban-rural dual structure is highly prominent [2]. Rural areas confront issues such as inadequate facilities, lacking professional guidance, and weak organization, whereas urban communities face problems like “emphasizing construction while neglecting management” and a shortage of specialized services [3]. This urban-rural “sports gap” severely restricts the realization of health equalization [4].

Existing studies predominantly focus on macro-level policies and qualitative analyses, lacking large-sample quantitative empirical research specific to western provinces. Consequently, it is difficult to accurately delineate the differences in urban-rural demands and the root causes of supply-demand mismatches. Grounded in the specific provincial conditions of Shaanxi and taking urban and rural older adults as the research subjects, this study systematically reveals the demand differences, their underlying mechanisms, and the supply-demand conflicts. By constructing differentiated fulfillment paths, this study aims to provide empirical data support and decision-making references for improving the public sports service system for older adults and advancing urban-rural equalization.

2. Research Subjects and Methods

2.1 Research Subjects and Sampling Methods

This study selected urban and rural resident older adults (aged ≥ 60 years) in Shaanxi Province as the general research population. A multi-stage stratified random sampling method was adopted to cover the three major regions of Shaanxi Province: Guanzhong, Southern Shaanxi, and Northern Shaanxi. A total of 700

questionnaires were distributed. After excluding invalid questionnaires and those with missing core variables, 600 valid questionnaires were ultimately obtained, yielding an effective recovery rate of 85.71%. Among them, 305 were from urban areas and 295 from rural areas. The balanced sample structure met the requirements of inferential statistical comparison.

2.2 Measurement Tools

A self-designed questionnaire titled Questionnaire on the Demands and Satisfaction of Public Sports Services among Urban and Rural Older Adults in Shaanxi Province was utilized. It consists of four sections: basic information, sports participation, service demands, and satisfaction. The Cronbach's α coefficients for the service demands scale and the satisfaction scale were 0.885 and 0.890, respectively. The KMO value of the questionnaire was 0.879, and Bartlett's test of sphericity reached a highly significant level ($P < 0.05$), indicating good reliability and validity of the measurement tools.

2.3 Data Processing and Statistical Analysis

Data processing and analysis were conducted using SPSS 26.0 software. The specific methods included: (1) adopting a binary Logistic regression model to explore the driving factors of sports participation among older adults and evaluate the role of macro-environmental variables; (2) employing independent samples

T-tests to compare the mean differences in various demands and satisfaction levels between urban and rural older adults; and (3) utilizing the Importance-Performance Analysis (IPA) model to construct a four-quadrant diagnostic matrix, with the mean demand scores as the vertical axis and the mean satisfaction scores as the horizontal axis. The significance level for all statistical inferences was set at $\alpha = 0.05$.

3. Research Results

3.1 Status and Influencing Factors of Sports Participation among Urban and Rural Older Adults

Descriptive statistics revealed that the regular exercise rate of the entire sample was 48.83% ($n = 293$). The Chi-square (χ^2) test, grouped by urban-rural attributes, indicated a significant difference in participation rates between the two groups ($\chi^2 = 109.516$, $P < 0.05$). The regular exercise participation rate for the urban sample was 69.83%, whereas it was only 27.12% for the rural sample, demonstrating a prominent urban-rural participation gap.

To further explore the key variables driving this gap, a binary Logistic regression model was constructed with "whether participating in regular physical exercise" (0=No, 1=Yes) as the dependent variable, incorporating macro-environmental conditions and individual characteristics. The analysis results are shown in Table 1.

Table 1. Binary Logistic Regression Analysis of Influencing Factors on Regular Sports Participation among Older Adults

Variables	B	SE	Wald	Sig.(P)	Exp(B)
Individual characteristics					
Self-rated health (higher level)	1.152	0.328	12.345	0.000	3.165
Educational attainment (higher level)	0.875	0.278	9.871	0.002	2.399
Personal monthly income (higher level)	0.231	0.097	5.678	0.017	1.260
Macro-environmental variables					
Urban-rural attribute (Rural = reference group, Urban = 1)	0.693	0.178	15.211	0.000	2.000
Constant	-2.543	0.550	21.452	0.000	0.079

The data in Table 1 indicate that physical health ($\text{Exp}(B) = 3.165$), educational attainment ($\text{Exp}(B) = 2.399$), and personal monthly income ($\text{Exp}(B) = 1.260$) are significant individual-level determinants. After controlling for individual characteristics, the environmental factor of the urban-rural attribute remains significant ($P < 0.05$). The likelihood of urban older adults engaging in regular exercise is twice that of their rural counterparts ($\text{Exp}(B) = 2.000$, $P < 0.05$), demonstrating that environmental factors play an

independent and decisive role.

3.2 Structural Differences in Service Demands and Satisfaction between Urban and Rural Older Adults

To quantitatively analyze the targeted allocation of limited public resources, differences in the multidimensional demand items and satisfaction evaluation items within the questionnaire were examined. Independent samples T-tests were employed to compare the means between the

urban and rural sample groups.

Table 2. Analysis of Differences in Public Sports Service Demands and Satisfaction between Urban and Rural Older Adults

Evaluation Dimensions and Indicators	Overall Mean (M)	Urban Group (M1)	Rural Group (M2)	T-value	Sig. (P)
1. Demands for Venues and Facilities					
(1) Walking-friendly fitness trails	4.08	3.85	4.32	-5.730	0.000
(2) Free or low-cost parks and squares	4.01	3.75	4.28	-6.140	0.000
(3) Age-friendly indoor activity centers	3.86	4.20	3.51	6.450	0.000
2. Demands for Activity Programs					
(4) Group activities such as square dancing and aerobics	4.02	3.50	4.56	-12.500	0.000
(5) Lectures on scientific fitness	4.07	4.45	3.68	9.140	0.000
3. Demands for Organization and Guidance					
(6) Regular and free physical fitness monitoring	4.00	4.30	3.69	7.440	0.000
(7) Guidance from professional social sports instructors	3.91	4.25	3.56	7.850	0.000
(8) Regular activities organized by community/village committees	3.57	3.35	3.80	-4.950	0.000
4. Perceived Satisfaction					
(9) Availability and hardware of nearby venues	3.91	4.15	3.66	5.250	0.000
(10) Professionalism of locally available guidance	3.75	4.02	3.47	5.880	0.000
5. Overall Evaluation of Sports Services	3.76	4.05	3.46	6.150	0.000

As shown in Table 2, the service demands of the urban and rural samples exhibited statistically significant differences ($P < 0.001$):

The preferences of the rural group were characterized by a typical “baseline-guarantee” pattern. Constrained by the scarcity of physical venues in rural areas, their demands for “free parks/squares” ($M=4.28$) and “fitness trails” ($M=4.32$) were exceptionally robust. Simultaneously, restricted by the traditional acquaintance society (Gemeinschaft) and the digital divide among older adults, the rural group relied heavily on “group activities” with social bonding functions ($M=4.56$). Furthermore, they possessed a stronger expectation for “regular activities organized by village committees” within the institutional hierarchy ($M=3.80$).

Conversely, the preferences of the urban group exhibited a typical “advanced professional intervention” pattern. Because outdoor public spaces in cities are often compressed, they showed a strong preference for “age-friendly indoor centers” ($M=4.20$). Moreover, the urban cohort’s inclination toward scientific and rehabilitative interventions has become dominant, manifesting as significant demands for “scientific lectures” ($M=4.45$), “free physical fitness monitoring” ($M=4.30$), and “exercise guidance from professional instructors”

($M=4.25$).

Overall, perceived satisfaction in terms of both “hardware” and “software” indicators was significantly higher in the urban group than in the rural group. The overall satisfaction with public sports services in rural areas merely hovered at a moderate level of 3.46, which indirectly corroborates the lagging delivery of public goods at the grassroots level.

3.3 IPA Quadrant Matrix Analysis of Supply-Demand Matching

To intuitively illustrate the service indicators that require prioritized interventions, an Importance-Performance Analysis (IPA) matrix was utilized to assess the supply-demand match. Setting the mean demand score of older adults for various service items as the Y-axis and the mean actual satisfaction score as the X-axis, a “four-quadrant matrix” was constructed, which was divided by the grand means ($X=3.76$, $Y=3.85$) as the cutoff points (as illustrated in Figure 1).

(1) Maintenance Quadrant (High Demand - High Satisfaction)

This quadrant contains only two infrastructure-based services: nearby community fitness paths and walking-friendly fitness trails. This indicates that the supply of basic fitness facilities in urban and rural areas of Shaanxi

Province is relatively sufficient, effectively satisfying the core demands of older adults for convenient and accessible workouts. The

supply-demand matching degree is high, and these areas should be continuously consolidated and refined [5].

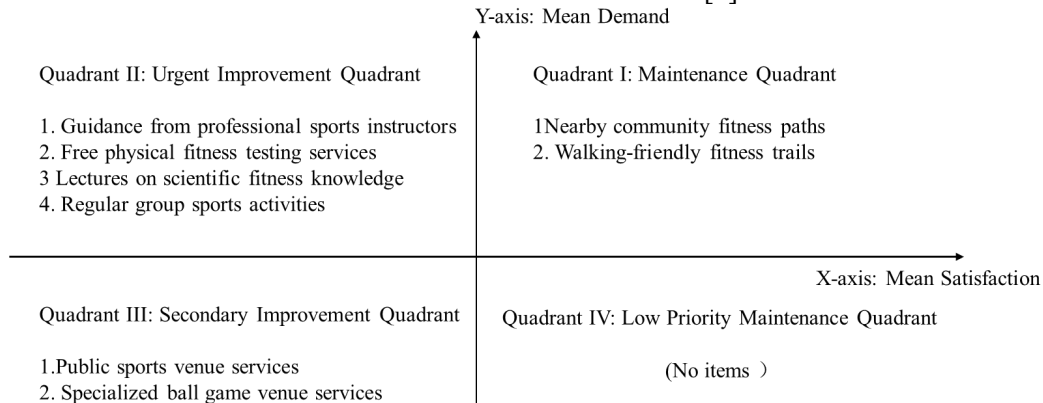


Figure 1. Demand-Satisfaction Quadrant Matrix of Public Sports Services for Older Adults in Shaanxi Province

(2) Urgent Improvement Quadrant (High Demand - Low Satisfaction)

Four services are concentrated here: guidance from professional social sports instructors, regular and free physical fitness monitoring, lectures on scientific fitness knowledge, and regular sports activities organized within communities or villages. These services exhibit a high intensity of demand but suffer from insufficient supply and low satisfaction. They represent the most prominent and core supply-demand mismatch in the current public sports services for older adults in Shaanxi Province.

(3) Secondary Improvement Quadrant (Low Demand - Low Satisfaction)

Public sports venue services and specialized ball games, such as table tennis and gateball, fall into this quadrant. The demand for these services is limited and does not constitute a universal rigid demand (essential need) for the older adult cohort [6]. Since both the supply level and satisfaction are low, this is categorized as a secondary area for consideration.

(4) Low Priority Maintenance Quadrant (Low Demand - High Satisfaction)

No items are distributed in this quadrant in the current analysis, indicating that there are no service types exhibiting a relative supply surplus alongside insufficient demand.

4. Empirical Analysis Conclusions

4.1 Significant Urban-Rural Gap in Sports Participation

There is a prominent difference in the sports participation behavior between urban and rural

older adults. The participation level in urban areas is substantially higher than that in rural areas, forming an obviously unbalanced urban-rural sports development pattern. After controlling for individual characteristics, the urban-rural external environment still exerts an independent and significant impact on sports participation among older adults, acting as the key structural factor causing the participation gap. Issues in rural areas, such as inadequate facilities, absence of organizational structures, and a weak fitness atmosphere, directly constrain the sports participation of the older adult cohort [7].

4.2 Structural and Hierarchical Polarization of Urban-Rural Demands

Fundamental differences exist in the demands for public sports services between urban and rural older adults. Rural demands are predominantly basic and inclusive, focusing on fundamental fitness venues, accessible public spaces, and local collective sports programs. In contrast, urban demands have upgraded to advanced and precise types, placing greater emphasis on scientific fitness guidance, physical fitness monitoring, and specialized health intervention services. The hierarchy and structure of demands exhibit evident urban-rural disparities.

4.3 Significant Urban-Rural Disparities in Service Satisfaction

The overall satisfaction with public sports services among urban older adults is significantly higher than that of their rural counterparts. The supply level and service

experience in rural areas are generally weak, reflecting a relatively low degree of urban-rural equalization. Supply shortcomings in rural areas—such as facility assurance, activity organization, and professional guidance—directly lead to low satisfaction, becoming prominent obstacles that restrict the high-quality development of older adult sports services.

4.4 Structural Mismatch in the Supply System Characterized by “Emphasizing Hardware While Neglecting Software”

The supply of public sports services for older adults across the province presents an evident mismatched state in which hardware is relatively sufficient while soft services are severely lagging. The insufficient supply of soft services—such as professional guidance, health assessments, scientific lectures, and normalized activity organization—creates a sharp conflict with the demands of the older cohort, constituting the core shortcomings and “pain points” of public sports services.

4.5 Sports Participation Demands are Driven by Multiple Compounding Factors

The sports participation behavior and service demands of older adults are the result of the combined effects of individuals’ internal conditions and external environments. Individual characteristics—including health status, educational attainment, and economic level—interact with macro-environmental factors such as urban-rural resource endowments, service supply, and organizational levels, collectively shaping the differentiated patterns of sports participation and demand characteristics between urban and rural areas.

4.6 Imperative Need to Implement Differentiated and Precise Urban-Rural Supply Strategies

The supply-demand mismatch in public sports services for older adults in Shaanxi Province exhibits significant urban-rural heterogeneity. Urban areas lean toward service quality enhancement, whereas rural areas require a baseline guarantee of fundamental facilities. A uniform, “one-size-fits-all” supply model can hardly accommodate authentic demands. It is imperative to implement differentiated resource allocation and service provision based on urban-rural differences to effectively resolve

supply-demand conflicts and advance the equalization of basic public sports services.

5. Construction of Differentiated Urban-Rural Fulfillment Paths

5.1 Urban Areas Focusing on the “Cross-Integration of Sports and Medicine” and Intellectual Input to Tackle Specialized Quality Enhancement

The paramount step is to deepen cross-departmental collaboration between the sports and public health sectors. Pertaining to routine medical check-ups for older adults, physical fitness and motor function assessment modules should be embedded. Based on the testing data, general practitioners, in collaboration with social sports instructors, can issue non-medical “personalized exercise prescriptions.” [8] Concurrently, normalizing sports risk prevention and chronic disease rehabilitation guidance within community grid services will establish a scientific health safety net for the large-scale aging population in urban areas.

5.2 Rural Areas Anchoring on “Micro-Space Remediation” and Acquaintance Networks to Consolidate the Inclusive Baseline Guarantee

Operating under limited financial constraints, idle lands of village committees, abandoned schools, or threshing floors should be utilized to construct low-cost, age-friendly, and weather-resistant fitness micro-spaces (e.g., anti-slip trails and rain-sheltered workout zones) to ensure safe and convenient exercise for older adults. Regarding organizational mechanisms, indigenous grassroots leaders—such as leading square dancers, Shehuo (traditional rural folk activities) team leaders, and retired teachers—should be identified. By providing training in first-aid and organizational skills, alongside conferring honorary certifications and micro-subsidies, they can be cultivated into local sports liaisons who organize activities relying on the profound rural acquaintance networks [9].

5.3 Coordinately Establishing a Data-Driven Provincial Financial Assessment Leverage

A third-party dynamic evaluation mechanism should be established to conduct blind evaluations every two years regarding the supply-demand gaps and soft-service investments at municipal and county levels [10].

Based on these assessment results, financial rewards and penalties will be executed: deducting sports public welfare funds from administrative units with prominent shortcomings, while implementing the policy of “replacing subsidies with rewards” for units with remarkable achievements. Such a rigid institutional system will compel grassroots departments to rectify deficiencies and proactively advance urban-rural equalization.

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