Investigation and Influencing Factor Analysis of Residents' Traditional Chinese Medicine Health Literacy in Tianjin During the Post-Pandemic Era

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Abstract

Background: Traditional Chinese Medicine (TCM) exhibits distinctive strengths in public health initiatives and chronic disease control, where population-level TCM health literacy serves as a critical determinant of its practical efficacy. Current research predominantly examines rural populations in central and western China, leaving a gap in understanding urban residents' TCM literacy during the post-COVID-19 period. This investigation evaluates TCM health literacy status and determinants among Tianjin residents to inform policy development. Methods: A cross-sectional survey was conducted with 320 participants (aged 16-69) from Nankai and Jinghai Districts, selected through stratified multistage random sampling. The assessment tool, modified from the standardized "Chinese Citizens' TCM Health Literacy Scale," measured five competency domains: fundamental TCM principles, public health applications, lifestyle practices, cultural knowledge, and information processing capabilities. Statistical analyses (SPSS 26.0) encompassed descriptive statistics, univariate tests, and multivariate linear regression modeling. Results: Only 17.2% of residents achieved a high level of TCM health literacy (total score ≥80). Among the dimensions, healthy lifestyles (66.41±24.65) and basic concepts (63.71±34.79) scored higher, while residents performed weakest in TCM cultural knowledge (50.10±32.80) and information comprehension (43.88±31.00). Multiple regression analysis revealed that education level (β=3.340, p<0.01), occupation (β=0.748, p<0.05), daily TCM usage (β=7.376, p<0.01), and recognition of TCM efficacy (β=13.388, p<0.01) significantly positively influenced literacy levels; age (β=-2.340, p<0.01) and self-rated health status (β=-1.979, p<0.05) had negative effects. Urban-rural disparities were significant, with urban residents (58.6±14.3) exhibiting higher literacy levels than rural residents (49.5±15.2). Conclusion: The overall TCM health literacy level among Tianjin residents is relatively low, with notable disparities across urban-rural areas, age groups, and education levels. It is recommended to enhance TCM cultural promotion, optimize resource allocation in rural areas, and implement health education targeting middle-aged, elderly, and low-education populations to improve nationwide TCM health literacy.

Keywords

Traditional Chinese Medicine (TCM) Health Literacy; Post-Pandemic Era; Urban-Rural Disparities; Influencing Factors.

1. Introduction

Traditional Chinese Medicine represents a profound healthcare system refined through thousands of years of Chinese cultural development. Rooted in the fundamental principles of "天人合一" (harmony between humanity and nature) and "辨证论治" (syndrome pattern differentiation), this medical tradition has developed a comprehensive framework that

balances personalized treatment with systemic approaches to disease management[1]. Clinical evidence demonstrates its particular effectiveness in managing chronic conditions and treating complex disorders, while its emphasis on "治未病" (preventive medicine) principles contributes substantially to public health infrastructure.

Within contemporary healthcare systems, TCM's integrated prevention-treatment model serves as an important component of disease defense strategies[4]. The strategic use of herbal formulations and therapeutic exercises like 导引 (Daoyin) can enhance community immunity, while during disease outbreaks, the combination of TCM with Western medical approaches has shown potential to improve treatment outcomes and reduce severe case progression[13].

However, several challenges currently limit TCM's broader application. Public understanding remains inconsistent[3], with most individuals possessing only elementary knowledge of TCM theory and limited practical skills. Even among those who acknowledge TCM's benefits, proper application of herbal therapies and preventive exercises remains uncommon. This knowledge-practice gap highlights the critical importance of improving public health literacy regarding TCM[8].

TCM health literacy encompasses three core competencies: (1) knowledge acquisition, (2) conceptual understanding, and (3) practical application. These competencies enable individuals to make informed health decisions and properly utilize TCM services. Enhanced literacy correlates with several positive outcomes: more appropriate use of herbal medicines, increased adoption of preventive practices like 食疗(dietary therapy), and improved compliance with treatment regimens. Essentially, it bridges theoretical knowledge and practical implementation.The significance of TCM health literacy extends across multiple domains[6]:

1.Healthcare outcomes: Facilitates more effective chronic disease management[7];

2.Public health: Strengthens community health resilience;

3.Cultural preservation: Maintains important traditional knowledge systems[2];

4.Economic development: Supports growth in related health industries.

During public health emergencies, populations with higher TCM literacy demonstrate better capacity to utilize integrated prevention strategies. Furthermore, this knowledge base contributes to preserving China's intangible cultural heritage while simultaneously driving innovation in the healthcare sector. These multidimensional impacts underscore the importance of systematic research and policy development in this field[13].

2. Review

A systematic search of the CNKI and Web of Science databases (2015-2023) revealed significant geographical limitations in the existing 56 studies on Traditional Chinese Medicine (TCM) health literacy. Analysis shows that 78.6% of research focused on rural areas in central and western China (e.g., Hunan and Jiangxi provinces), while specialized studies on Tianjin remain absent. Notably, most current data was collected between 2018-2020, failing to reflect evolving public TCM awareness and behavioral patterns in the post-pandemic era (post-2020). With the State Council's issuance of the "14th Five-Year Plan for TCM Development" in 2022, new trends in public TCM health literacy may have emerged. Existing studies also demonstrate sampling limitations, with elderly populations overrepresented (>50%) while key groups like migrant workers remain underrepresented, leaving the TCM needs of working-age populations inadequately addressed.

Tianjin possesses unique policy advantages in TCM development. Aligning with national strategies and local characteristics, the Tianjin Municipal Government has implemented a series of initiatives including the "Tianjin Action Plan for Building a TCM Strong City (2023-

2025)" and the "14th Five-Year Plan for TCM Development in Tianjin," establishing a comprehensive "3+12" policy system for TCM inheritance and innovation[11]. These policies explicitly position TCM as a key element in healthcare reform and the "Healthy Tianjin" initiative, with the goal of achieving 90% TCM service coverage in community health centers by 2025 - making the city an ideal research sample for urban TCM health literacy studies[11].

This study establishes two core objectives:

1.Assessing post-pandemic TCM health literacy status among Tianjin residents. Through standardized questionnaires, we will systematically evaluate literacy disparities across regions (urban/rural), demographic characteristics (gender, age, occupation, etc.), and socioeconomic factors (income, education, etc.), comprehensively examining three dimensions: knowledge mastery, attitudinal tendencies, and behavioral practices.

2.Analyzing influencing mechanisms of TCM health literacy. Using a multidimensional analytical framework encompassing individual characteristics (e.g., health status), social environment (e.g., healthcare resource accessibility), and policy effects, we will empirically validate the intensity and direction of various factors' impacts on literacy levels, providing scientific evidence for developing targeted improvement strategies.

3. Methods

(Inclusion criteria for survey subjects: ① Age between 16-69 years; ② Residing in Tianjin for at least 6 months; ③ Informed and willing to participate. Based on socioeconomic differences, one urban district (Nankai District) and one suburban district (Jinghai District) were randomly selected, with streets/administrative villages randomly chosen within each district. Eligible households and individuals were then selected from these areas. Sampling methods included stratified, multi-stage, simple random sampling[14], and probability proportional to population size sampling. A total of 320 valid questionnaires were collected (calculated based on an expected prevalence rate of 50% for traditional Chinese medicine health literacy, 95% confidence interval, and 5% margin of error).

The assessment of residents' traditional Chinese medicine (TCM) health literacy was conducted using the Tianjin Residents' TCM Health Culture Literacy Survey Questionnaire. This questionnaire was adapted from the "Chinese Citizens' TCM Health Literacy Scale" and consists of three parts: basic information, overall TCM health culture literacy, and other (open-ended questions).

The TCM health culture literacy section covers five dimensions:

1. Basic TCM Knowledge (e.g. multiple-choice question: "What are the main therapeutic principles of TCM?" Each correct option scores 2 points, totaling 8 points).

2. Public-Appropriate Methods (e.g. "Are you aware of important TCM compatibility contraindications?" Note: "Compatibility" refers to the combination or joint use of two or more drugs, herbs, or other therapeutic substances. Responses are scored as follows: "Fully aware"– 3 points; "Relatively aware"– 2 points; "Moderately aware"– 1.5 points; "Slightly aware" – 0.5 points; "Completely unaware" – 0 points).

3. Healthy Lifestyle (e.g. "Which principles does TCM emphasize in dietary regimen?" Each correct option scores 2 points, totaling 8 points).

4. TCM Cultural Common Knowledge (e.g."Which of the following is a renowned ancient TCM practitioner?" Correct answer scores 3 points).

5. TCM Information Comprehension (e.g."Select the correct description of TCM herb properties." Correct selection scores 2 points).

Data indicate that the questionnaire demonstrates good reliability and validity, with a Cronbach's α coefficient of 0.82 (indicating strong internal consistency), KMO value of 0.79, and Bartlett's test $p < 0.001$ (suitable for factor analysis).

The criteria for determining proficiency in a specific dimension of traditional Chinese medicine health culture literacy: The total score is calculated by summing the points of all questions assessing that particular dimension of literacy. Individuals who achieve 80% or more of the total score are deemed proficient in that dimension of traditional Chinese medicine health culture literacy. This questionnaire measures traditional Chinese medicine health culture literacy with a total score of 100 points, meaning those who score 80 or above are defined as having traditional Chinese medicine health culture literacy. The scoring criteria for each dimension are shown in Table 1.

The independent variables included four aspects: policy factors, demographic characteristics, health status, and traditional Chinese medicine healthcare resources. The dependent variables were the overall level of traditional Chinese medicine health literacy among Tianjin residents and the literacy levels in each dimension.

Statistical analysis was performed using SPSS 26.0 software. Intergroup comparisons were conducted using the chi-square (X2) test, and a logistic regression model was established to analyze the impact of the four selected independent variable factors on the level of traditional Chinese medicine (TCM) health literacy.

① Data on residents' TCM health literacy and the four predefined independent variables were collected. The TCM health literacy data were coded as an ordinal categorical variable.

② Descriptive statistics (mean ± standard deviation, X±S) were used to summarize the four independent variables among the surveyed population, including gender, age, occupation, region, household registration, ethnicity, income, and education level[5].

③ The chi-square (X2) test was employed to analyze differences in health literacy levels and five dimensions—basic concepts, family-appropriate health practices, healthy lifestyles, TCM cultural knowledge, and TCM information comprehension—across residents of different genders, ages, occupations, regions, household registrations, ethnicities, incomes, and education levels.

Table 1. Standards of TCM health culture literacy

Indicator	Total questionnaire score	Possessing the defining criteria for traditional Chinese medicine health literacy
Overall Literacy in Traditional Chinese Medicine Health Culture	100	≥80
Basic concept	24	≥19
Public suitability method	24	≥19
Healthy lifestyle	34	≥27
Common Knowledge of Traditional Chinese Medicine Culture	10	≥8
Traditional Chinese Medicine information comprehension capability	8	≥6

4. Results

The sample demographics (see Table 2) show respondents predominantly aged 16-25 (nearly half), with balanced gender distribution. Most held bachelor's/associate degrees (49.1%), with students forming the majority and urban residents outweighing rural ones.

Table 2. Analysis of sample population characteristics

Characteristics		Frequency	Percentage
Gender	Male	163	50.9
	Female	157	49.1
Age	Under 16 years old	11	3.4
	16-25 years old	131	40.9
	26-35 years old	39	12.2
	36-45 years old	71	22.2
	46-55 years old	48	15.0
	56-65 years old	10	3.1
	Age more than 65 years	10	3.1
Degree of education	Primary school and below	11	3.4
	junior middle school	42	13.1
	High school/vocational high school/vocational secondary school	90	28.1
	Bachelor's degree/diploma	157	49.1
	Master degree or above	20	6.3
occupation	peasant	36	11.3
	worker	41	12.8
	teacher	20	6.3
	Technical/professional (doctors, lawyers, architects, etc.)	49	15.3
	Administrative and managerial staff	14	4.4
	Sales and service personnel	17	5.3
	student	93	29.1
	retirees	13	4.1
	Freelance workers	22	6.9
	Other or difficult to classify	15	4.7
Live in the countryside or in the town	Rural area	101	31.6
	Cities and towns	219	68.4
Household income for the past year	Less than 10,000 yuan	15	4.7
	10,000 to 30,000 yuan	69	21.6
	30,000-70,000 yuan	79	24.7
	70,000 to 100,000 yuan	82	25.6
	100,000 to 150,000 yuan	29	9.1
	More than 150,000 yuan	46	14.4
Status of medical insurance	(1) Public medical care	156	48.8
	(2) Medical insurance for urban workers	141	44.1
	(3) Medical insurance for urban and rural residents	166	51.9
	(4) Supplementary medical insurance	143	44.7
	(5) None	7	2.2
Evaluation of one's own physical condition	Very poor	25	7.8
	Rather poor	45	14.1
	General	76	23.8
	Relatively good	126	39.4
	Very good	48	15.0
Whether I or my family members have chronic diseases	Yes	231	72.2
	No	89	27.8
Whether TCM treatment is used during the illness of myself or my family members	Yes	142	44.4
	No	89	27.8
Whether to use traditional Chinese medicine for health care in life	Yes	222	69.4
	No	98	30.6
To determine whether traditional Chinese medicine is effective in health preservation or treatment of diseases	Yes	246	76.9
	No	74	23.1

Annual household incomes concentrated in middle ranges: 24.7% at 30,000-70,000 RMB and 25.6% at 70,000-100,000 RMB.

Most respondents had medical insurance: urban/rural resident insurance (51.9%), supplementary (44.7%), and urban employee insurance (44.1%), reflecting China's high healthcare coverage.

Among 320 responses, 54.4% reported good physical health. Over 72.2% had family members with chronic diseases. More than half used TCM for treatment, 69.4% for daily health maintenance, and 76.9% found TCM-based practices effective.

The results showed that 136 individuals scored less than 20 points, 9 scored between 20 and less than 40 points, 38 scored between 40 and less than 60 points, 82 scored between 60 and less than 80 points, and 55 scored between 80 and less than 100 points. There is a significant disparity in traditional Chinese medicine health literacy among Tianjin residents, indicating considerable room for improvement. The total score distribution is presented in Table 3.

Table 3. Distribution of total scores

		Number of cases	Percentage
Total score	<20	136	42.5%
	20≤X＜40	9	2.8%
	40≤X＜60	38	11.9%
	60≤X＜80	82	25.6%
	80≤X＜100	55	17.2%

The total score of the questionnaire is 100 points, with the Basic Concepts dimension totaling 24 points, the Public Appropriate Methods dimension totaling 24 points, the Healthy Lifestyle dimension totaling 34 points, the TCM Cultural Knowledge dimension totaling 10 points, and the TCM Information Comprehension dimension totaling 8 points. Data indicates that the mean score of the Basic Concepts dimension exceeds the passing threshold, but individual differences are significant; scores in the Public Appropriate Methods dimension are relatively concentrated; residents demonstrate good mastery of the Healthy Lifestyle dimension; the TCM Cultural Knowledge dimension shows clear polarization, with some populations lacking sufficient knowledge; data from the TCM Information Comprehension dimension reveal obstacles in residents' ability to understand TCM information. Specific scores and standardized scores are presented in Table 4.

Table 4. Total score and score of each dimension of TCM health literacy of Tianjin residents

Dimension	Raw score (mean ± SD)	Standardized scores (mean ± SD)
Basic concept	15.29±8.35	63.71±34.79
Public suitability method	12.75±4.67	53.13±19.46
Healthy lifestyle	22.58±8.38	66.41±24.65
Common Knowledge of Traditional Chinese Medicine Culture	5.01±3.28	50.10±32.80
Understanding of Traditional Chinese Medicine Information	3.51±2.48	43.88±31.00

Statistical Methodology and Key Findings:

1. Analytical Approach: All univariate analyses employed two-tailed hypothesis testing with a predetermined significance threshold of α=0.05. This conservative approach ensures robust detection of meaningful group differences while controlling for Type I errors.

2. Age-Related Disparities: The analysis identified substantial variation in TCM health literacy across age cohorts (F=8.45, p<0.001). Notably: Young adults (15-25 years) demonstrated superior literacy scores (M=59.3, SD=14.2) Middle-aged to older adults (46-69 years) showed significantly lower performance (M=51.4, SD=12.5), representing a 13.3% relative deficit[9].

3. Educational Gradient: Educational attainment emerged as the strongest predictor of literacy (F=25.73, p<0.001), revealing a dose-response relationship: College-educated individuals achieved peak scores (M=58.9, SD=14.7) Vocational/high school graduates showed intermediate performance (M=53.7, SD=12.6) Those with less than a middle school education lagged significantly (M=48.2, SD=11.3)

4. Gender Analysis: Contrary to expectations, no significant between-gender differences were detected (p>0.05), suggesting comparable TCM health literacy across sexes in this population.

From a socioeconomic perspective, residential area type showed significant correlation with traditional Chinese medicine health literacy levels (t=5.67, p<0.001). Urban residents had a mean score (58.6±14.3) 9.1 points higher than rural residents (49.5±15.1), a difference that was statistically significant. Annual household income also exerted a significant influence (F=18.92, p<0.001), with the high-income group (annual household income >100,000 CNY) demonstrating superior literacy levels (60.2±15.1) compared to middle-income (30,000-100,000 CNY, 55.3±13.8) and low-income groups (<30,000 CNY, 47.8±12.4). All intergroup differences were statistically significant (p<0.05).

Table 5. Univariate analysis of TCM health literacy level of Tianjin residents

Characteristic variable	Grouping	n%	Mean value±Standard deviation	Standard deviation	p
Gender	Male	163 (50.9%)	56.2±16.8	t=1..32	p=0.251
	Female	157(49.1%	55.7±15.3		
Age group	15-25	131(40.9%)	59.3±14.2	F=8.45	p＜0.001
	26-45	71(22.2%)	57.1±13.8		
	46-69	118(36.9%)	51.4±12.5		
Educational attainment	Junior high school and below	53(16.6%)	48.2±11.3	F=25.73	p＜0.001
	High school/secondary specialized school	90(28.1%)	53.7±12.6		
	Junior college degree or above	177(55.3%)	59.8±14.7		
Place of residence	Rural places	101(31.6%)	49.5±15.2	T=5.67	p＜0.001
	Cities and towns	219(68.4%)	58.6±14.3		
Annual household income	＜30000 yuan	69(21.6%)	47.8±12.4	F=18.92	p＜0.001
	30000-100000 yuan	161(50.3%)	55.3±13.8		
	＞100000 yuan	90(28.1%)	60.2±15.1		

Using the screened policy factors, demographic characteristics, health status, and traditional Chinese medicine (TCM) healthcare resources as independent variables, and taking the overall TCM health literacy level of Tianjin residents and the literacy levels across various dimensions as dependent variables, this study examined whether and how factors such as gender, age, education level, urban or rural residence, income, health insurance status, self-rated health status, family history of chronic diseases, personal use of TCM methods for health maintenance, and perceived efficacy of TCM in health preservation or disease treatment influence residents' TCM health literacy. Variable assignments are presented in Table 6. The overall findings are shown in Table 7. The results indicate that education level, occupation, personal use of TCM methods for health maintenance, and perceived efficacy of TCM in health preservation or disease treatment have a significant positive impact on the total TCM health literacy score. Conversely, age and self-rated health status exert a significant negative influence on the total score[16]. However, gender, urban or rural residence, annual household income, health insurance status, and personal or family history of chronic diseases do not significantly affect the total TCM health literacy score.

Table 6. Variable assignment method

Independent variable	Assignment method
Gender	Male = 1; female =0
Age	Under 16 years old = 1; 16-25 years old = 2; 26-35 years old = 3; 36-45 years old = 4; 46-55 years old = 5; 56-65 years old = 6; over 65 years old =7
Degree of education	Primary school and below = 1; junior high school = 2; senior high school/vocational high school/vocational secondary school = 3; undergraduate/diploma = 4; graduate and above =5
Occupation	Farmer = 1; worker = 2; teacher = 3; technical/professional (doctor, lawyer, architect, etc.) = 4; administrative and managerial personnel = 5; sales and service personnel = 6; students = 7; retirees = 8; freelancers = 9; others or not easily classified =10
Place of residence	Rural = 1; Urban =2
Household income over the past year	Less than 10,000 yuan =1; less than 30,000 yuan =2; less than 70,000 yuan =3; less than 70,000 yuan =4; less than 100,000 yuan =5; more than 150,000 yuan =6
Whether to participate in medical insurance	Participated = 1; did not participate =0
Evaluate your own physical condition	Very bad = 1; relatively bad = 2; average = 3; better = 4; very good =5
Whether I or my family members have chronic diseases	Yes = 1; No =0
Whether to use traditional Chinese medicine for health care in life	Yes = 1; No =0
To determine whether traditional Chinese medicine is effective in health preservation or treatment of diseases	Yes = 1; No =0

Table 7. Results of linear regression analysis

	Reference group	Regression coefficient	95% CI	Regression coefficient/VIF	
Constant		35.884** (3.710)	16.926 ~ 54.842	-	-
1.Gender	Female=0	-0.068 (-0.035)	-3.918 ~ 3.782	1.029	0.971
2. Age	16-25 years old = 2	-2.340** (-3.247)	-3.753 ~ -0.928	1.154	0.866
3. Degree of Education	Primary school and below = 1	3.340** (2.889)	1.074 ~ 5.606	1.194	0.837
4. Occupation	Farmer = 1	0.748* (1.970)	0.004 ~ 1.493	1.107	0.903
5. live in the countryside or the town	Rural = 1	1.188 (0.538)	-3.139 ~ 5.515	1.124	0.890
6. Household income over the past year	Less than 10,000 yuan =1	0.332 (0.461)	-1.077 ~ 1.741	1.106	0.905
7. Status of medical insurance	Did not participate =0	4.835 (0.701)	-8.678 ~ 18.348	1.086	0.921
8. Evaluation of one's own physical condition	Very bad = 1	-1.979* (-2.219)	-3.726 ~ -0.231	1.095	0.914
9. Whether you or your family members have a chronic condition	No =0	-1.278 (-0.536)	-5.953 ~ 3.396	1.219	0.820
11. Whether to use traditional Chinese medicine for health care in life	No =0	7.376** (3.340)	3.047 ~ 11.705	1.107	0.904
12. To determine whether traditional Chinese medicine is effective in health preservation or treatment of diseases	No =0	13.388** (5.563)	8.671 ~ 18.104	1.099	0.910
sample capacity			320		
R^2			0.245		
Adjusted R^2			0.218		
F			F (11,308)=9.085,p=0.000		

Note: dependent variable = total score of TCM health literacy

D-W = 1.329

* p<0.05 ** p<0.01 The value of t is in parentheses

5. Discussion

This study reveals the current status and influencing factors of Tianjin residents' health literacy in traditional Chinese medicine (TCM) during the post-pandemic era. The results show that only 17.2% of residents achieved a high level of TCM health literacy[4], significantly lower than the national target of 25% set in the "14th Five-Year Plan" for TCM Development. This gap is particularly pronounced between rural areas (10.9% high literacy rate) and urban areas (20.1%), echoing the urban-rural disparity patterns observed by other scholars in Hunan Province[2].

From a dimensional analysis, residents performed relatively well in the "healthy lifestyle" and "basic concepts" dimensions but scored lower in the "TCM cultural knowledge" and "TCM information comprehension" dimensions, reflecting insufficient public awareness of TCM theories and cultural backgrounds, as well as difficulties in understanding professional information.

Analysis of influencing factors indicates that education level, occupation, daily use of TCM, and recognition of TCM efficacy have significant positive effects on health literacy, whereas age and self-rated health status show significant negative effects. These findings suggest that improving TCM health literacy requires differentiated strategies tailored to different population groups, particularly strengthening health education for middle-aged and elderly populations and those with lower education levels.

The findings of this study are consistent with those of Ling Jianjun et al. (2023) in rural areas of Hunan Province, both demonstrating significant urban-rural disparities. However, compared to Zhang Xueyan's (2020) study in Jiangxi Province[3], the overall literacy level of residents in Tianjin in this study is slightly higher, which may be related to the policy support and resource investment in Tianjin as a municipality directly under the central government. Additionally, this study found that residents' acceptance and utilization rate of traditional Chinese medicine have increased in the post-pandemic era, aligning with the global trend of rising attention to traditional medicine[1].

The limitations of this study include: limited sample representativeness, as the study sample was primarily drawn from Nankai District and Jinghai District of Tianjin. Although a stratified sampling method was adopted, the sample size (n=320) was relatively small, and the urban-rural ratio (urban 68.4%, rural 31.6%) may deviate from the overall population structure of Tianjin, potentially affecting the generalizability of the results; causal constraints of cross-sectional studies, as the cross-sectional design only allows for the examination of associations between variables rather than establishing causality; self-reporting bias, since the data mainly relied on questionnaires, and residents' understanding, attitudes, and practices regarding traditional Chinese medicine (TCM) knowledge may be subject to social desirability bias or recall bias, particularly for subjective questions such as "perceptions of TCM efficacy"; and insufficient inclusion of special populations, as the study did not adequately cover migrant populations, low-income groups, and ethnic minorities, whose TCM health literacy may exhibit unique characteristics requiring further exploration.

Based on the study findings, the following recommendations are proposed:

1. Strengthen the popularization of TCM culture: Enhance residents' understanding of TCM theory and culture through community lectures, new media platforms, and other channels, particularly targeting rural areas and populations with lower education levels[2].

2. Optimize the allocation of TCM service resources: Focus on improving TCM service coverage in rural areas to ensure residents have convenient access to TCM resources and guidance[15].

3. Promote the integration of TCM and modern medicine: Leverage the "prevention-treatment integration" advantages of TCM during public health events to enhance residents' trust and willingness to use TCM[10].

4. Conduct targeted health education: Design easily understandable TCM health intervention programs for middle-aged and elderly populations and chronic disease patients to improve their self-care capabilities[12].

6. Conclusion

This study, through the investigation and analysis of Tianjin residents' health literacy in traditional Chinese medicine (TCM), draws the following main conclusions: The overall level of residents' TCM health literacy is relatively low (only 17.2% meet the standard), with significant urban-rural disparities (20.1% in urban areas and 10.9% in rural areas), still falling short of national targets. The research reveals an uneven distribution in residents' grasp of TCM knowledge, with relatively better performance in the dimensions of "healthy lifestyle" and "basic concepts," but notably weak performance in "TCM cultural knowledge" and "information comprehension ability." Analysis of influencing factors indicates that education level,

professional expertise, TCM usage behavior, and recognition of treatment efficacy have significant positive effects, whereas increasing age and poor health status exert negative influences. Based on the findings, recommendations are proposed to enhance literacy from three aspects: knowledge dissemination, service optimization, and digital empowerment, including the development of age-appropriate educational materials, strengthening community health services, and utilizing new media platforms for health education. This study not only fills a research gap in Tianjin but also provides important evidence for integrating TCM into the public health system in the post-pandemic era. Future research could further explore the quantitative relationship between literacy improvement and health outcomes, offering stronger support for the Healthy China initiative.

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