«ГОСУДАРСТВЕННОЕ И МУНИЦИПАЛЬНОЕ УПРАВЛЕНИЕ ПРОЕКТАМИ И ПРОГРАММАМИ»

Исследование текущего состояния и мер поддержки традиционной китайской медицины для местных жителей на примере Наньнина, провинция Гуанси, Китай

Research on the Current Status and Countermeasures of Traditional Chinese Medicine Health Management Among Community Residents in Nanning, Guangxi, China

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Аннотация

Цель: изучить когнитивные и поведенческие характеристики профилактики и лечения методами традиционной китайской медицины (ТСМ), независимые факторы их развития, а также текущее состояние служб управления здоровьем на основе ТСМ для жителей общин города Наньнин, провинция Гуанси, Китай. Метод: был разработан опросник по управлению здоровью методами ТСМ для жителей общин. Всего распространено 320 анкет, получено 314 достоверных ответов (98,13%). Статистический анализ данных выполнен с использованием *Microsoft Excel*, тесты χ^2 и бинарный логистический регрессионный анализ проведены в ПО *SPSS* 20.0. Результаты: Распространенность болей в шее, плечах ногах, пояснице (*NSLLP*_ составила 69,43%. Уровень образования и район проживания являются независимыми факторами, влияющими на данное состояние ($P < 0,05$). Жители демонстрируют высокую осведомленность о подходах ТСМ: 62,10% предпочитают вмешательство ТСМ при появлении симптомов, общая доля опробовавших методы ТСМ составляет 81,53%. Тем не менее 36,62% жителей никогда не пользовались общинными услугами ТСМ, основными причинами являются недостаточная информированность и несоответствие предложения потребностям населения. Заключение: *NSLLP* широко распространена среди жителей Наньнина, ТСМ имеет прочную общественную базу в лечении хронической боли и пользуется высоким признанием. Однако существует выраженное несоответствие спроса и предложения услуг ТСМ на первичном уровне, что приводит к низкой используемости. В исследовании предлагаются меры: создание многоуровневой системы точной профилактики

Abstract

Objective: To investigate the cognitive and behavioral characteristics of Traditional Chinese Medicine (TCM) prevention and treatment, its independent influencing factors, and the current status of community TCM health management services among residents in Nanning, Guangxi, China.

Method: A self-designed TCM health management questionnaire was distributed to community residents. A total of 320 questionnaires were issued, and 314 valid responses (98.13%) were collected. Statistical analysis was performed using Microsoft Excel, and χ^2 tests and binary logistic regression analysis were conducted with SPSS 20.0. Results: The prevalence of pain in the neck, shoulders, legs, and lower back (NSLLP) was 69.43%. Educational level and residential area were independent influencing factors ($P<0.05$). Residents showed high overall awareness of TCM approaches: 62.10% preferred TCM intervention for symptom relief, with an overall TCM intervention attempt rate of 81.53%. However, 36.62% had never used community TCM health management services, mainly due to insufficient service awareness and a mismatch between service supply and residents' needs. Conclusion: NSLLP is highly prevalent among Nanning residents, and TCM has a solid grassroots foundation in chronic pain management with high resident acceptance. Nevertheless, there is a prominent supply-demand mismatch in primary TCM health management services, leading to low utilization. This study proposes targeted countermeasures, including establishing a tiered precision prevention and control system, closing health education gaps, improving service accessibility, advancing supply-side structural reform, and developing an AI-powered integrated TCM health management platform.

и контроля, совершенствование медицинского просвещения, повышение доступности услуг, продвижение структурных реформ предложения и разработка интегрированной платформы управления здоровьем ТСМ на основе ИИ.

Ключевые слова: предотвращение и лечение боли, традиционная китайская медицина, управление проектами в здравоохранении.

Keywords: prevention and treatment of pain, Traditional Chinese Medicine, Health project management.

1. Background

Globally, musculoskeletal (chronic strain) pain, particularly chronic neck, shoulder, low back and leg pain (NSLLP), has become one of the major public health issues contributing to individual functional impairment, declining quality of life, and significant socioeconomic burdens [1]. In China, with the accelerated aging of the population and profound changes in work and lifestyle patterns, the prevalence of chronic musculoskeletal pain-represented by neck, shoulder, lumbar, and leg pain-remains persistently high, posing a critical challenge in implementing the "Healthy China 2030" strategy. Recent studies indicate that in 2021, the age-standardized prevalence of neck pain in China reached 2,549.87 per 100,000 population, with the disease burden being most severe in the 70–74 age group and showing a significant gender disparity, with higher incidence rates among women than men [2]. Another cross-sectional study of elderly residents in Chinese communities further confirmed that neck and shoulder pain, as well as leg and foot pain, are highly prevalent among the elderly, with female incidence rates significantly higher than those of males [3]. These pains not only cause persistent suffering but also rank as the fourth leading cause of disability, and their chronic persistence is closely associated with a markedly increased risk of severe pain.

However, due to the complexity of pathogenic factors, fluctuating symptom severity, and lack of typical clinical manifestations, community residents often underestimate these conditions or seek treatment only during acute episodes, resulting in inadequate systematic prevention and management, which leads to recurrent and chronic disease progression.

In addressing this severe public health challenge, TCM has demonstrated unique value and increasingly robust scientific evidence in the field of chronic pain management. TCM theory emphasizes a holistic approach and syndrome differentiation-based treatment, employing diverse intervention methods such as oral and topical administration of herbal medicines, acupuncture and massage, and guiding exercises (e.g., Tai Chi and Baduanjin). These approaches not only focus on "treating existing diseases" but also prioritize the preventive principle of "preventing disease before it occurs." Modern research confirms that acupuncture and electroacupuncture alleviate pain by modulating neuroimmune-inflammatory pathways and activating endogenous analgesic systems [4]; herbal compound formulations exert anti-inflammatory, analgesic, and microcirculatory improvement effects through multi-target and multi-pathway mechanisms [5]. Additionally, physical and mental exercises like Tai Chi and Qigong not only relieve pain but also significantly enhance patients' psychosocial well-being. In community settings, a study involving elderly patients with cervical, shoulder, lumbar, and leg pain revealed that the observation group receiving comprehensive TCM interventions (e.g., herbal medicine, acupuncture, and manual therapy) achieved significantly higher overall efficacy rates, greater pain relief, and better recurrence control compared to the control group treated with conventional Western medications [6]. This conclusively demonstrates the advantages of TCM in community-based chronic pain management, including proven efficacy, relatively fewer side effects, and high patient acceptance.

It is precisely due to these advantages that the national level has vigorously promoted the integration of TCM into primary healthcare systems. In recent years, a series of policy documents, including the "14th Five-Year Action Plan for Enhancing Primary TCM Service Capabilities," have been issued, explicitly incorporating TCM health management services into the national basic public health service program. These services are promoted nationwide through standardized project management approaches, with clear implementation paths, assessment indicators and phased promotion plans, and a mandatory goal of full coverage of TCM clinics in community health service centers and township hospitals has been set [7]. In summary, NSLLP-common and frequently occurring conditions affecting community residents' health and quality of life-are now being addressed with a greater focus on community-based prevention and management. Strong national policy support has facilitated the integration of TCM into community health management, and various service models have demonstrated positive outcomes. Therefore, this study aims to contribute insights and solutions through in-depth investigation and analysis to establish a more

efficient, equitable, and sustainable new model for community TCM health management.

2. Research Methods

2.1. Survey Subjects

Using cluster sampling method, three administrative districts of Nanning City in the Guangxi Zhuang Autonomous Region-China-were selected as the survey areas based on factors such as geographical location and economic conditions: Qingxiu District, Xingning District, and Jiangnan District. Two communities were randomly chosen from each district for the survey. A total of 320 questionnaires were distributed, with 314 valid responses collected, yielding an effective response rate of 98.13%.

Inclusion criteria: (1) The study targets permanent residents within the community; (2) Residents capable of independently completing the questionnaire and clearly expressing their thoughts; (3) Age between 18–80 years and voluntary participation in the study.

2.2. Survey Tool

This study employed a self-developed "Traditional Chinese Medicine Health Management Survey Questionnaire " The questionnaire consists of four modules: 1) Sociodemographic characteristics: gender, age, occupation, educational level, monthly income, and residential area; 2) Prevalence and clinical features of NSLLP: presence of the condition, affected anatomical regions, disease duration, and impact on daily life and work; 3) Current awareness and behavioral patterns of TCM in managing cervical, shoulder, lumbar, and leg pain among community residents: awareness of TCM prevention and treatment approaches, preferred healthcare-seeking methods, and intervention attempts; 4) Supply and demand dynamics of TCM health management services in the community: service utilization rates, reasons for non-utilization, service needs, and preferred service delivery formats.

2.3. Statistical Methods

Descriptive statistics were performed on categorical data using Excel, expressed as frequencies (composition ratios/ratios), along with the creation of pie charts and bar charts. Univariate analysis and binary logistic regression were conducted using SPSS 20.0 software, and forest plots for regression analysis of disease factors were generated with R 4.4.3. The significance level was set at $\alpha = 0.05$, with $P < 0.05$ indicating statistical difference. Intergroup comparisons of categorical data were performed using the χ^2 test, and binary logistic regression was employed to identify independent influencing factors for neck-shoulder-lower back-leg pain.

3. Results

3.1. General Demographic Characteristics of Community Residents

This study distributed a total of 320 questionnaires, with 314 valid responses collected, yielding an effective response rate of 98.13%. The general demographic characteristics of the participants are detailed in table 1.

Table 1

General Characteristics of Community Residents (Total Sample Size n = 314)

Project		Number of examples	Constituent ratio
Sex	Man	112	35.67%
	Woman	202	64.33%
Age	18–30 years old	85	27.07%
	Ages 31–40	77	24.52%
	Ages 41–50	60	19.11%
	Ages 51–60	53	16.88%
	Aged 61–70	34	10.83%
	Aged 71–80	5	1.59%
Occupation	In-service (Office)	94	29.94%
	In-service (physical labor)	32	10.19%
	In-service (Other)	85	27.07%
	Retire	60	19.11%
	Student	24	7.64%
	Liberal professions	17	5.41%
	Unemployed	2	0.64%
Degree of education	Primary school and below	3	0.96%
	Junior middle school	7	2.23%
	High School/Secondary Vocational School	38	12.1%
	Junior college	70	22.29%
	Bachelor's degree or higher	196	62.42%
Monthly Income (RMB)	< 3000	57	18.15%
	3000–5000	101	32.17%
	5001–8000	60	19.11%
	8001-12000	27	8.6%
	>12000	12	3.82%
	Refuses to disclose	57	18.15%
Residential zone	Old town	144	45.86%
	New Urban District	91	28.98%
	Rural-urban fringe zone	58	18.47%
	Other	21	6.69%

3.2. Current prevalence of neck, shoulder, lumbar and leg pain among community residents

Among the 314 community residents surveyed, 218 reported experiencing neck, shoulder, lumbar, or leg pain within the past three months, yielding a total prevalence rate of 69.43%. The overall distribution of symptoms is shown in figure 1.

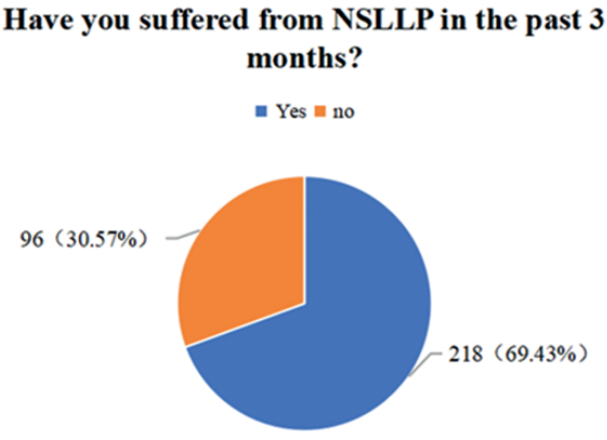


Figure 1. Pie chart showing the incidence rate of NSLLP among community residents

The symptom distribution by affected body regions, disease duration, and impact on daily life and work are detailed in table 2.

Table 2

Current prevalence of NSLLP among community residents (total number of affected individuals n = 218)

Project		Number of examples	Constituent ratio
Mainly affected sites of symptoms	Neck	18	8.26%
	Shoulder	5	2.29%
	Loin	21	9.63%
	Leg	5	2.29%
	Other areas	1	0.46%
	Affecting one or more areas	168	77.06%
Symptom duration	< 3 months	70	32.11%
	3–6 months	35	16.06%
	6–12 months	6	2.75%
	> 1 year	107	49.08%
The degree of impact of symptoms on daily life/work	has/have no influence	10	4.59%
	Mild (occasional discomfort, not affecting daily activities)	137	62.84%
	Moderate (frequent discomfort, limited ability to perform some activities)	61	27.98%
	Severe (persistent pain that significantly impairs activity)	8	3.67%
	Extremely severe (impaired ability to live or work normally)	2	0.92%

3.3. Analysis of Influencing Factors for Cervical, Shoulder, Lumbar, and Leg Pain Among Community Residents

3.3.1.Univariate χ^2 test for factors influencing disease incidence among community residents

To identify potential influencing factors for the prevalence of neck-shoulder-back-leg pain among community residents, a one-way χ^2 test was employed to analyze the associations between independent variables-including gender, age groups, educational level, and residential area-with the incidence of neck-shoulder-back-leg pain. The significance level was set at $\alpha = 0.05$, with $P < 0.05$ considered statistically significant. Factors demonstrating statistical associations were selected to serve as the basis for subsequent binary logistic regression analysis. A total of 314 subjects were enrolled in the study, comprising 218 patients with neck-shoulder-back-leg pain (prevalence rate: 69.43%) and 96 healthy controls (non-prevalence rate: 30.57%). The results of the one-way χ^2 test are presented in Table 3.

(1) Statistically significant factors: Educational level and residential area showed significant associations with the prevalence of NSLLP (all P-values < 0.05).

(2) Factors without statistical significance: Gender, age groups, and occupation showed no significant association with the prevalence of NSLLP (all $P \geq 0.05$).

Table 3

Univariate χ^2 test for factors influencing the prevalence of NSLLP among community residents (total sample size n = 314)

Influencing factor	Divide into groups	Total number of cases	Number of cases	Case rate	χ^2 price	P price
Sex	Man	112	76	67.86%	0.202	0.653
	Woman	202	142	70.30%		
Age	Ages 18–30	85	58	68.24%	0.827	0.975
	Ages 31–40	77	54	70.13%		
	Ages 41–50	60	40	66.67%		
	Ages 51–60	53	37	69.81%		
	Aged 61–70	34	25	73.53%		
	Aged 71–80	5	4	80.00%		

End of Table 3

Influencing factor	Divide into groups	Total number of cases	Number of cases	Case rate	χ^2 price	P price
Occupation	In-service (Office)	94	63	67.02%	9.432	0.151
	In-service (physical labor)	32	24	75.00%		
	In-service (Other)	85	51	60.00%		
	retire	60	49	81.67%		
	student	24	17	70.83%		
	liberal professions	17	12	70.59%		
	unemployed	2	2	100.00%		
Degree of education	Primary school and below	3	2	66.67%	17.857	0.001
	junior middle school	7	5	71.43%		
	High School/ Secondary Vocational School	38	16	42.11%		
	junior college	70	46	65.71%		
	Bachelor's degree or higher	196	149	76.02%		
Residential zone	old town	144	103	71.53%	16.568	0.001
	New Urban District	91	73	80.22%		
	rural-urban fringe zone	58	33	56.90%		
	other	21	9	42.86%		

3.3.2. Binary Logistic Regression Analysis of Factors Influencing Community Residents' Illness

Using the presence of neck-shoulder-back-leg pain as the binary dependent variable and educational level and residential area-both showing statistically significant differences in the one-way chi-square test-as independent variables, the variables were coded as follows: dependent variable status (1 = yes, 0 = no); educational level (1 = primary school or below, 2 = junior high school, 3 = high school/technical secondary school, 4 = college, 5 = bachelor's degree or above); and residential area (1 = old urban area, 2 = new urban area, 3 = urban-rural fringe, 4 = others). A binary logistic regression model was constructed using the Enter method to analyze the independent influencing factors of neck-shoulder-back-leg pain prevalence among community residents.

The core results of the binary logistic regression analysis are presented in Table 4 and figure 2. The results demonstrated that educational level and residential area were independent influencing factors for the prevalence of neck-shoulder-lower back-leg pain among community residents (all $P < 0.05$). Compared with individuals holding a bachelor's degree or higher, those with high school/technical secondary education exhibited a significantly reduced risk of developing the condition, serving as an independent protective factor (OR = 0.284; 95% CI: 0.134–0.603; P = 0.001), with a 71.6% lower risk compared to the reference group. In contrast, residents of old urban areas (OR = 3.256; 95% CI: 1.246–8.509; P = 0.016) and new urban areas (OR = 4.566; 95% CI: 1.622–12.854; P = 0.004) showed significantly elevated risks, representing independent risk factors.

Table 4

Binary Logistic Regression Analysis of Influencing Factors for NSLLP Among Community Residents

Influencing factor	Regression coefficient B	Standard error S.E.	P price	OR price	OR value 95% CI
Degree of education (Referring to undergraduate or higher education)	–	–	0.023*	–	–
Primary school and below	–0.321	1.250	0.797	0.725	0.063~8.394
Junior middle school	0.142	0.878	0.871	1.153	0.206~6.439
High School/ Secondary Vocational School	–1.258	0.384	0.001**	0.284	0.134~0.603
Junior college	–0.395	0.312	0.205	0.674	0.366~1.241
Residential zone					
(Refer to other regions)	–	–	0.014*	–	–
Old town	1.180	0.490	0.016*	3.256	1.246~8.509
New Urban District	1.519	0.528	0.004**	4.566	1.622~12.854
Rural–urban fringe zone	0.662	0.533	0.214	1.939	0.683~5.508
Note: *P < 0.05, **P < 0.01; Model coefficient: Omnibus comprehensive test χ^2 = 27.527, df = 7, P < 0.001; Hosmer–Lemeshow goodness–of–fit test χ^2 = 0.909, df = 6, P = 0.989; Model Nagelkerke R^2 = 0.119, overall prediction accuracy 72.3%					

3.4. Current Status of Community Residents' Awareness and Behaviors Regarding Traditional Chinese Medicine for the Prevention and Treatment of NSLLP

Figure 3 illustrates the awareness levels of community residents regarding various TCM approaches for preventing and treating NSLLP. The results show that

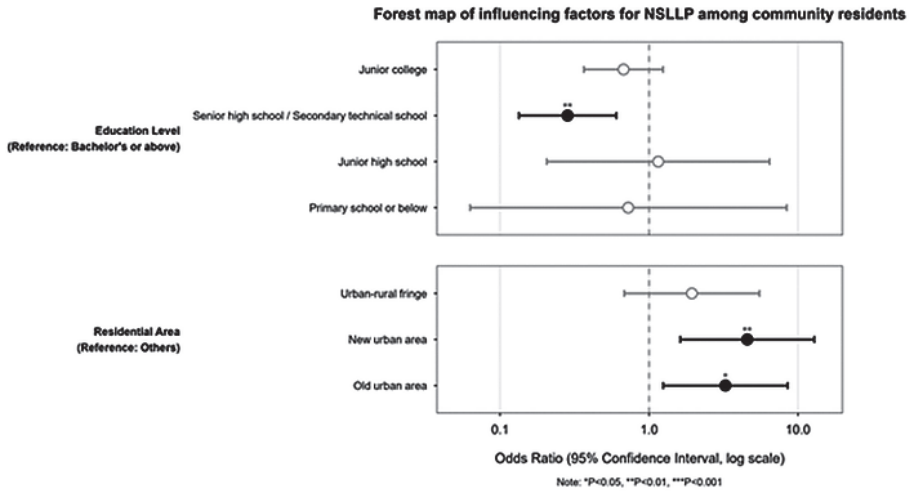


Figure 2. Forest map of influencing factors for NSLLP among community residents

acupuncture and massage had the highest awareness rates. Awareness rates for exercise regimens, oral administration of Chinese herbal medicine, and gua sha were relatively lower.

Regarding the preferred medical-seeking approach during episodes of neck-shoulder-lower back-leg pain, the distribution of residents' choices is shown in Figure 4. The results indicate that TCM intervention was the most preferred option during symptom onset, with 195 cases (62.10% of the total sample).

The trial status of community residents regarding TCM interventions is shown in Figure 5. The results indicate that among the 314 surveyed individuals, 256 had attempted TCM-based approaches for the prevention and treatment of NSLLP, achieving an overall trial rate of 81.53%. Only 58 individuals (18.47%) had not attempted TCM interventions.

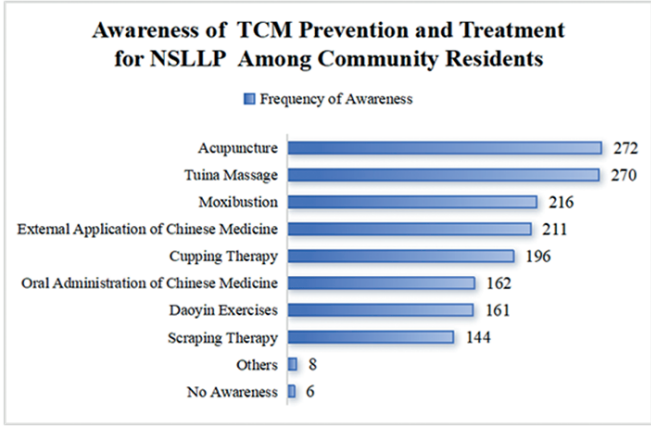


Figure 3. Bar chart showing the awareness level of TCM in preventing and treating NSLLP

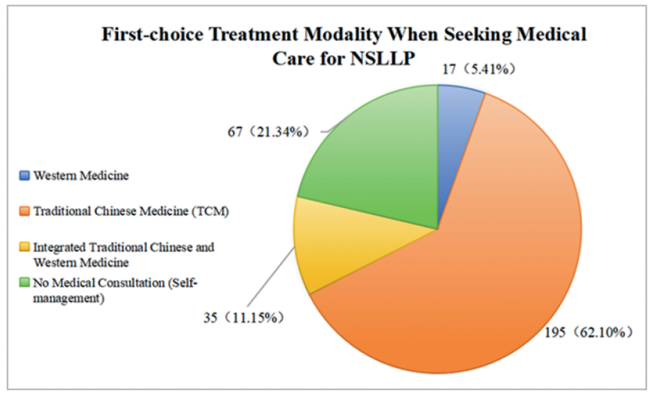


Figure 4. Pie chart illustrating the preferred medical consultation approach for NSLLP

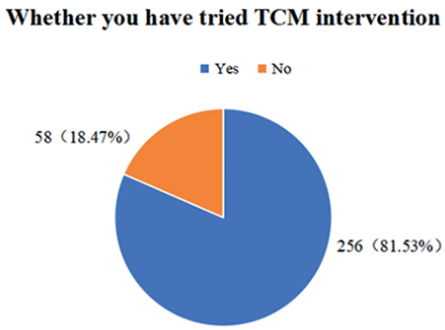


Figure 5. Pie chart showing the trial rate of TCM interventions

3.5. Supply and Demand Situation of Community Traditional Chinese Medicine Health Management Services

Figure 6 illustrates the utilization rate of various TCM health management services provided by community

health service institutions among residents. The results show that acupuncture was the most frequently utilized TCM service, with 147 selection. The utilization rates for TCM herbal regulation, TCM health lectures, and exercise training were relatively lower, with 75,54, and 47 selections respectively. A total of 115 residents reported never having received any TCM health management services from the community, accounting for 36.62% of the total sample size, indicating significant room for improvement in overall community TCM service utilization.

Figure 7 illustrates the distribution of reasons for underutilization of community TCM services. The results indicate that the primary reason was lack of awareness about the availability of such services in the community.

Figure 8 shows residents' preferences for TCM health management service formats. The results indicate that the most preferred service format is offline outpatient visits, followed by online consultations. Offline outpatient visits remain the primary format for residents to access community TCM services, while diversified formats such as online consultations and home visit services also demonstrate high demand.

Figure 9 illustrates the content demands of community residents for TCM health management services related to NSLLP. The results indicate that the most sought-after service was personalized constitution regulation, with 227 selections.

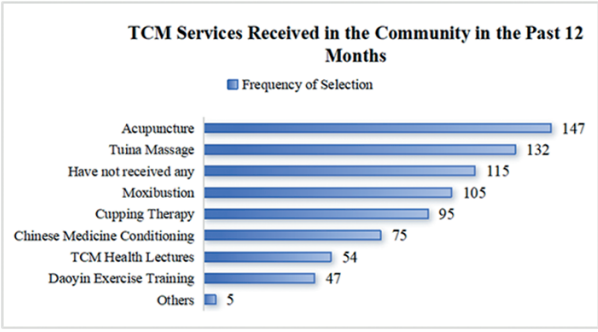


Figure 6. Bar chart showing the utilization level of community TCM services

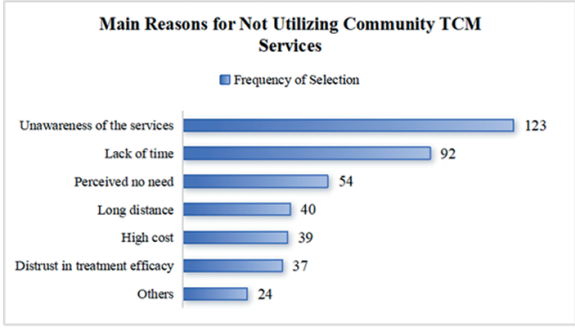


Figure 7. Horizontal bar chart illustrating reasons for underutilization of community TCM services

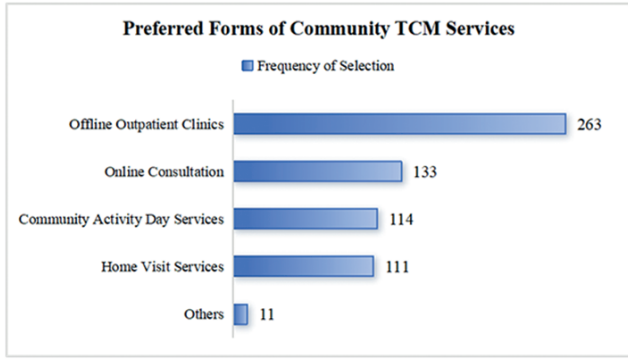


Figure 8. Bar chart of preferred community TCM service levels

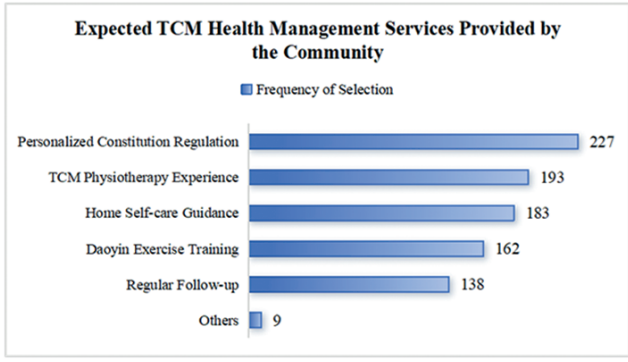


Figure 9. Bar chart of expected community TCM health management service levels

4. Discussion

This study investigated permanent residents of communities in Nanning, Guangxi, conducting a cross-sectional survey to systematically analyze the prevalence of neck-shoulder-lower back-leg pain among community residents, its independent influencing factors, their cognitive behaviors regarding TCM prevention and treatment, and the supply-demand dynamics of grassroots TCM health management services. The findings provide localized empirical evidence for optimizing the TCM prevention and control system for chronic musculoskeletal pain in communities and implementing policies to enhance grassroots TCM service capabilities. TCM intervention was the preferred approach during symptom onset; however, significant supply-demand disparities persist in grassroots TCM health management services. The core findings are discussed below.

4.1. Epidemiological Characteristics and Public Health Implications of Cervical, Shoulder, Lumbar, and Leg Pain among Community Residents

This survey reveals that the prevalence rate of neck-shoulder-lower back-leg pain among Nanning community residents over the past three months reached

69.43%, indicating a relatively high level. This suggests that the condition has become one of the most prevalent chronic health issues among local residents and represents a critical challenge that requires urgent resolution in primary public health services [8]. Chronic pain remains a significant risk factor for anxiety, depression, sleep disorders, and motor dysfunction, with substantial long-term health consequences that cannot be overlooked [9]. Second, there is a pronounced trend toward younger onset: over 50% of the sample consisted of individuals aged 18–40, challenging the traditional perception that neck-shoulder-lower back-leg pain is an age-related condition. This phenomenon is closely linked to sedentary office work, prolonged use of electronic devices, and a sedentary lifestyle prevalent in the internet era, making young and middle-aged adults a high-risk group for musculoskeletal chronic strain. This underscores the necessity of shifting prevention and intervention efforts toward this demographic [10]. Third, no statistically significant differences in prevalence were observed between genders or occupations. Future studies should expand the sample size for further validation.

4.2. Analysis of Independent Influencing Factors for Cervical, Shoulder, Lumbar, and Leg Pain

This study confirmed through binary logistic regression analysis that educational attainment and residential area are independent influencing factors for the prevalence of neck-shoulder-lumbar-leg pain among community residents, thereby identifying targeted populations for precise community-based prevention and control. In terms of educational attainment, those with high school/technical secondary education exhibited a significantly reduced disease risk (OR = 0.284,95% CI: 0.134–0.603), serving as an independent protective factor. This finding is directly correlated with the occupational characteristics of highly educated individuals: the surveyed bachelor's degree holders were predominantly office workers who engage in prolonged sitting and maintain chronic non-physiological loads on their spinal and muscular systems [11]. Combined with high workplace stress and insufficient regular physical activity, these multiple risk factors significantly elevate the disease risk [12]. This suggests that health education for neck-shoulder-lumbar-leg pain should also emphasize behavioral interventions targeting highly educated office workers to promote the translation of health knowledge into healthy behaviors. This aligns closely with the regional population structure: the new urban area serves as the city's core business district, housing a large number of sedentary office workers who face an extremely high risk of occupational muscle strain [13]; the old urban area is predominantly composed of older residential communities and prolonged household labor further increases the pain risk [14]; residents in the urban-rural fringe areas engage in more daily physical activity, exhibit better muscle strength and spinal stability, and exhibit significantly lower prevalence rates of NSLLP [15]. These findings underscore that new and old urban areas constitute the primary frontlines for community-based disease prevention and control, necessitating differentiated strategies tailored to each region.

4.3. Cognitive and Behavioral Characteristics of Traditional Chinese Medicine Prevention and Treatment

The findings of this study fully demonstrate the strong public foundation and unique advantages of TCM in community-based chronic pain management. The survey revealed that only 1.91% of residents were completely unfamiliar with TCM prevention and treatment methods. These results indicate that TCM has become the preferred solution for Nanning community residents managing NSLLP, underscoring the solid public support for the national policy promoting TCM integration into primary healthcare. Western medicine primarily employs symptomatic pain relief measures such as nonsteroidal anti-inflammatory drugs (NSAIDs) and opioids, which carry distinct side effect risks-including sedation, nausea, constipation, respiratory depression, and addiction-while NSAIDs may cause gastrointestinal damage and renal impairment without effectively halting disease progression [16]. In contrast, TCM, establishes a diversified intervention system encompassing acupuncture, massage, moxibustion, and therapeutic exercises, all of which demonstrate unique advantages in community chronic pain management [17]. TCM not only focuses on pain relief but also enhances patients' overall physical condition through constitution regulation and functional exercises, thereby reducing the risk of recurrence. Meanwhile, this study also identified an imbalance in the dissemination of TCM knowledge: residents exhibit high awareness of therapeutic interventions such as acupuncture and massage, but demonstrate low awareness of preventive measures like exercise regimens and oral TCM herbal therapy. This reflects a current shortcoming in community TCM education This lack of awareness is a significant contributing factor to recurrent episodes and chronic conditions, highlighting a critical gap that requires urgent addressing in subsequent community TCM

health management efforts. Future work should focus on enhancing the education and promotion of the "preventive treatment" philosophy.

4.4. Supply-Demand Disparities and Optimization Strategies in Community Traditional Chinese Medicine Health Management

The most prominent finding of this study is the significant contradiction between residents 'high acceptance of TCM and the low utilization rate of primary-level services. Although the attempt rate for TCM interventions exceeds 80%, 6.62% of residents have never utilized TCM health management services provided by their communities.

The core issues lie in three aspects: First, insufficient dissemination of service information — "not being aware that relevant services are available in the community". The conventional service hours in communities are completely mismatched with the work schedules of office workers, making "lack of time to access services" the second major constraint. Second, a structural mismatch between supply and demand: current community services primarily focus on therapeutic physiotherapy, whereas residents' highest demand lies in preventive and comprehensive lifecycle management services/ Third, limited service formats remain dominated by in-hospital offline outpatient visits, with severe shortages of diversified services such as online consultations, home visits, and community activities, failing to meet the diverse needs of different populations, including the elderly and office workers.

Based on the above findings and aligned with the policy requirements for grassroots TCM service capacity building, this study proposes optimization paths centered on standardized project management: First, establish a tiered and precise prevention and control project system targeting key populations. For young and middle-aged populations, extend prevention and control measures to office settings; for elderly populations, provide home-based healthcare and home visit services, establishing a comprehensive life-cycle management cycle encompassing "screening-intervention-follow-up-recurrence prevention." Second, address health education gaps and innovate project-based education models: deliver fragmented educational content to young and middle-aged populations through online channels, and provide face-to-face guidance to elderly populations with a focus on promoting the TCM concept of "preventive treatment" [18]. Third, overcome service accessibility barriers by achieving full coverage of community TCM service information through multi-channel outreach, offering weekend and extended nighttime clinics to meet the time needs of office workers. Fourth, advance structural reforms in service provision by accelerating the shift from a "disease-centered" to a "health-centered" approach, strengthening the delivery of preventive services. Fifth, artificial intelligence (AI) is currently widely applied across various fields, and the deep integration of AI with TCM health management has become a significant trend in the digital transformation of primary public health services [19]. AI technologies can be utilized to establish an intelligent, integrated TCM health management platform, creating a comprehensive digital service system covering the entire process of "prevention-intervention-rehabilitation-long-term management." Tailored to the characteristics of Nanning's community residents, the platform delivers three core values: customized health plans, 24/7 service responsiveness, and intelligent empowerment of primary healthcare capabilities, precisely meeting the health management needs of diverse populations. Based on this framework, pilot projects should first be conducted in the surveyed urban areas of Nanning to validate the model's effectiveness through community intervention trials. Once the pilot yields positive results and establishes a standardized implementation system, the approach should be promoted nationwide to create a replicable digital paradigm for TCM health management, facilitating the deeper integration of TCM into primary public health services. The integration of traditional TCM with the national healthcare system is crucial for achieving universal health coverage [20].

4.5. Research Limitations and Prospects

This study has certain limitations: First, it only included residents of Nanning communities as survey subjects, and the findings cannot be directly generalized to other regions nationwide; Second, being a cross-sectional study, it can only analyze correlations between variables but cannot establish causal relationships; Third, the sample exhibits a disproportionately high proportion of highly educated and young-to-middle-aged individuals, leading to certain selection bias.

Future research could further expand the sample size and survey scope by conducting multicenter epidemiological studies to more comprehensively elucidate the prevalence characteristics of neck-shoulder-lower back-leg pain among community residents in China and the current status of TCM health management. Prospective cohort studies could be carried out to identify the risk

factors and causal relationships underlying the disease, while intervention-based empirical studies on community-based TCM health management models could be conducted to validate their effectiveness and feasibility. These efforts would provide practical evidence for the full integration of TCM into primary public health service systems and support the implementation of the "Healthy China 2030" strategy.

5. Conclusion

This study conducted a cross-sectional survey among 314 permanent residents of communities in Nanning, Guangxi, systematically elucidating the prevalence status, independent influencing factors, and supply-demand characteristics of TCM health management services for neck-shoulder-lumbar-leg pain among local community residents. The results revealed that the prevalence rate of neck-shoulder-lumbar-leg pain among Nanning community residents over the past three months reached 69.43%. The affected population exhibited distinct features: multi-site involvement, chronic disease course, and younger onset age. Educational level and residential area were identified as independent influencing factors for the disease, with highly educated office workers and residents in both new and old urban areas constituting key target populations for community-based prevention and control. The study confirmed that TCM possesses a strong grassroots foundation in managing chronic musculoskeletal pain at the community level, with residents demonstrating high awareness, acceptance, and clinical preference for TCM therapeutic approaches. However, current primary-level TCM health management services face significant supply-demand mismatches, including inadequate service information dissemination, structural mismatches between service offerings and resident needs, and limited service formats, all of which severely constrain service utilization rates.

In response, this study proposes a series of targeted solutions: Primary healthcare institutions should prioritize residents' health needs, identify key populations for prevention and control, and establish a hierarchical, precise, and comprehensive closed-loop project and program management system for disease prevention and control. Innovative educational approaches should be adopted to address the shortcomings in promoting the TCM concept of "preventive treatment of disease." By optimizing service hours and expanding diversified service channels, accessibility barriers can be overcome, accelerating the transition from a "disease-centered" to a "health-centered" supply-side model. Concurrently, an AI-powered integrated TCM health management platform should be developed to leverage digital technologies in addressing the limitations of primary healthcare services and improving the alignment between supply and demand. These measures will optimize service delivery, thereby effectively integrating TCM into the primary public health service system.

References

1. Al-Ajlouni YA, Al Ta'ani O, Zweig S, et al. Quantifying the strain: A global burden of disease (GBD) perspective on musculoskeletal disorders in the United States over three decades: 1990–2019. J Clin Med 2024;13(22):6732.
2. Zhao G, Zhang X, Zhao X, et al. Burdens of neck pain in China from 1990 to 2021 and its projection to 2050: Findings from the Global Burden of Disease Study 2021. Pak J Med Sci 2026;42(2):371–384.
3. Li X, Zhu W, Li J, et al. Prevalence and characteristics of chronic pain in the Chinese community-dwelling elderly: A cross-sectional study. BMC Geriatr 2021; 21(1): 534.
4. Ji D, Lyu Z, Erasmus S, et al. Microglia's phenotypic heterogeneity in pain pathogenesis and electroacupuncture analgesia: Mechanisms and therapeutic potential. J Pain Res 2025; 18: 6007–6022.
5. Zhao W, Gong Y, Gu YY, et al. Clinical application and characteristics of traditional Chinese medicine in treating chronic pain. Chin Hosp Med Eval Anal 2021; 21(5): 637–640.
6. Shen L, Liang ML, Wang J, et al. Effect analysis of traditional Chinese medicine in preventing and treating neck, shoulder, lumbar, and leg pain among elderly community residents. Chin Community Physician 2023; 39(12): 80–82.
7. Gu Y. Research on the current status and countermeasures of traditional Chinese medicine health management services in community health service centers. Int J Tradit Chin Med Res 2025; 5(2).
8. Luo N, Tang C, Li S, et al. Investigation on the current status of musculoskeletal disorders among key occupational groups in the tertiary industry of Nanning City. Occup Health Emerg Rescue 2025; 43(6): 712–718.
9. Aaron RV, Ravyts SG, Carnahan ND, et al. Prevalence of depression and anxiety among adults with chronic pain: A systematic review and meta-analysis. JAMA Netw Open 2025; 8(3): e250268.
10. Mehmood M, Rashid Khan S, Ishaque A, et al. Tech strain: The musculoskeletal impact of electronic devices on young adults: A cross-sectional study. J Pak Med Assoc 2025; 75(7): 1086–1090.
11. Grabara M. Prevalence of musculoskeletal disorders among Polish white-collar workers: The role of physical activity and risk factors. Front Public Health 2025; 13.
12. Mohammadian M, Mollahoseini S, Naghibzadeh-Tahami A. Musculoskeletal disorders among office workers: Prevalence, ergonomic risk factors, and their interrelationships. Sci Rep 2025; 15(1).
13. Gülüstan ZN, Sağlam S, Dere Ö, et al. Analysis of occupational and non-occupational factors related to spinal pain

in office workers who use computer: A cross-sectional study from Türkiye. Workplace Health Saf 2025; 73(11): 571–581.
14. Guan SY, Zheng JX, Zhang SX, et al. Global burden of musculoskeletal disorders in adults aged 50 and over, 1990–2021: Risk factors and sociodemographic inequalities. J Cachexia Sarcopenia Muscle 2025; 16(4): e70008.
15. Wang BY. Analysis of the relationship between community residents' sports activity levels, functional movement screening, and shoulder/neck pain [D]. Chengdu: Sichuan Normal University; 2021.
16. Zhou CY, Liu Q, Zhang MJ, Liu YP, Li J. Research progress on analgesic traditional Chinese medicines. Drug Inf 2025;14(3): 154–161.
17. Kong L, Wang X, Zhao J, et al. Visual analysis of research hotspots and trends of external therapies in traditional Chinese medicine for chronic pain. Front Med 2026; 12.
18. Li Q, Luo S, Jiang T, et al. Research on the development of traditional Chinese medicine health care in Guilin. Int J Gen Pract Nurs 2024; 2(4): 52–59.
19. Hou S. Trends for the development of traditional Chinese medicine in the digital & artificial intelligence era: Integration into daily wellness practices, smart digitalization, and globalization. Well-Being Sci Rev 2025; 1(2): 81–83.
20. Park YL, Canaway R. Integrating traditional and complementary medicine with national healthcare systems for universal health coverage in Asia and the Western Pacific. Health Syst Reform 2019; 5(1): 24–31.