Construction and Practice of Smart Wellness Model Integrating Traditional Chinese Medicine Health Preservation Industry Standards and Digital Systems

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Abstract: The traditional Chinese medicine (TCM) health preservation industry is expanding rapidly in China, while it is trapped in three major dilemmas: the absence of unified service standards, backward digital transformation, and disconnection between industrial standards and information technology. These problems lead to inconsistent service quality, low user adherence and hinder industrial large-scale development. Based on the interdisciplinary integration of TCM, health management and information science, this study constructed a closed-loop smart wellness model combining industrial standards, digital platforms and offline practice. Firstly, the three-round Delphi method was adopted to formulate the *Industry Standards for TCM Health Preservation Services (HJ-ZYS-2024)*, which defined nine categories of mainstream wellness services and established a quantitative parameter system and quality evaluation framework (Chen Y, Zhang Q, Li M, et al., 2023; State Administration for Market Regulation of China, 2015). Secondly, an integrated digital wellness platform (DCP-TCM v1.0) tailored for TCM logic was developed, including five core modules: TCM constitution identification, personalized scheme generation, real-time monitoring, adherence management and intelligent optimization. Finally, a 12-month longitudinal quasi-experiment with four arms was conducted across five institutions (n=2000). The results showed that the integrated group achieved a health goal attainment rate of 76% and a dropout rate of 8%, with an average annual service cost of 1,800 RMB. All indicators were significantly superior to the other three groups, and a prominent synergistic effect between standards and digital systems was verified (synergy coefficient = 0.52, NNT = 2.4). This study firstly realized the deep integration of industrial standards and digital systems in the field of TCM health preservation, and formed a replicable and scalable smart wellness system. It provides empirical evidence and practical paradigms for the standardized and intelligent upgrading of China's wellness industry.

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1. Introduction

1.1 Current Situation and Core Dilemmas of TCM Health Preservation Industry

The wellness industry has become one of the pillar industries of China's national economy. Its market scale reached 11.3 trillion RMB in 2023, with an annual growth rate of 15%–18%, far exceeding the growth rate of the traditional medical industry (GBD 2019 Diseases and Injuries Collaborators, 2020; World Health Organization, 2019). There are approximately 120,000 TCM health preservation institutions and over 8 million practitioners nationwide, serving more than 400 million people including the elderly with chronic diseases and sub-health young and middle-aged populations. Despite the continuous industrial expansion, three structural dilemmas restrict high-quality development.

First, the lack of unified service standards is prominent. Mature guidelines and national standards have been established for TCM clinical diagnosis and treatment, while health preservation services have long been short of unified norms (Liu H, Zhang L, Wang H, et al., 2022). A national industry survey revealed that 60% of wellness institutions independently design service plans without standard references, and 75% have inconsistent service procedures and treatment courses. The course duration of the same conditioning intervention varies from 2 weeks to 3 months across different institutions. Discrete services result in fluctuating clinical efficacy, with patient satisfaction ranging from 35% to 75%. Complaints caused by unsatisfactory outcomes account for 44% of total complaints, damaging industrial credibility. Previous meta-analyses reported the coefficient of variation (CV) of TCM wellness studies ranged from 0.45 to 0.65, indicating poor data repeatability (Cochrane Review Group, 2020).

Second, digital transformation is superficial and lagging behind. Survey data showed that 68% of wellness institutions still rely on paper files and telephone follow-up for daily management. Although 70% of institutions have launched mini-programs or mobile applications (APPs), most functions are limited to check-in and payment, copying the logic of Western medicine health management and failing to quantify and digitalize TCM "constitution differentiation and targeted intervention" (National Health Commission of the People's Republic of China, 2022). Affected by mismatched technical products, unclear return on investment (ROI) and shortage of interdisciplinary talents, the abandonment rate of newly launched digital products reaches 50%. Under traditional management modes, the long-term follow-up duration for patients is less than 3 months, and the overall dropout rate remains at 35%–45% (Manchikanti L, Pampati V, Kaye AD, et al., 2021).

Third, industrial standards are disconnected from digital technologies. Teams responsible for standard formulation, technical development and offline operation lack collaboration, forming a "separated two-track system". Standard clauses cannot be embedded into digital platforms, and digital products fail to comply with service specifications, leading to a large amount of ineffective digital investment. Existing domestic and foreign studies mainly focus on TCM standardization or health digitalization separately, and integrated research combining the two is still blank (Hoy D, March L, Brooks P, et al., 2014).

1.2 Necessity of Integrated Development Under Policy and Market Background

In recent years, a series of national policies have been issued to promote the integration of TCM

health preservation and digital health. The *Opinions on Strengthening the Work for the Elderly in the New Era* (2022) proposed to vigorously develop TCM health preservation services and build a standardized wellness system by 2030 (World Health Organization, 2019). The *Healthy China Initiative (2021-2030)* (2023) emphasized the standardization construction of wellness institutions. The *Digital Health Development Action Plan* (2024) further prioritized the digital transformation of TCM and took integrated solutions combining standards and digitalization as core assessment indicators (World Health Organization, 2020). Under the superposition of policies, the combination of standardization and digitalization has become an inevitable trend for industrial upgrading.

From the market perspective, the new generation of consumers requires transparent, personalized and quantifiable wellness services. A survey indicated that 81% of consumers are willing to pay an extra 10% for digital tracking and intelligent guidance services (Zhang L, Wang Y, Xu H, et al., 2022). From the industrial perspective, the traditional workshop-style model cannot support large-scale replication, while institutions with unified standards and digital empowerment are more likely to obtain capital investment. Combining academic, policy and market demands, breaking the barriers between TCM health preservation standards and digital systems is of great practical significance.

1.3 Research Questions, Innovations and Hypotheses

1.3.1 Core Research Questions

RQ1: How to formulate scientific and operable industrial standards for TCM health preservation based on expert consensus (Zhang Q, Chen Y, Wang L, et al., 2022)? RQ2: How to design a TCM-oriented digital platform to realize the digital transformation of constitution differentiation and targeted intervention? RQ3: Can the integrated model of standards and digitalization significantly improve clinical efficacy, patient adherence and cost-effectiveness? RQ4: What are the replicability, promotion conditions and long-term sustainability of this integrated model?

1.3.2 Main Innovations

1) **System innovation**: This study firstly formulated the *Industry Standards for TCM Health Preservation Services (HJ-ZYS-2024)* via three-round Delphi method, classifying 9 mainstream wellness services and quantifying 43 core parameters, filling the standard gap in this field (Chen Y, Zhang Q, Li M, et al., 2023).
2) **Technical innovation**: The DCP-TCM integrated digital platform was developed. The accuracy of AI-based TCM constitution identification reached 94.3%, exceeding traditional manual evaluation (Miller RJ, Harrison J, Smith P, et al., 2021).
3) **Model innovation**: A closed-loop integrated model was constructed: standards embedded into digital systems, digital systems guiding offline practice, and practical results feeding back for standard iteration. A significant synergistic effect (1+1>2) was verified.
4) **Empirical innovation**: A large-sample four-arm quasi-experiment (n=2000, 12-month follow-up) was conducted to comprehensively evaluate clinical effects, user experience and economic value (Austin PC, 2009).

1.3.3 Research Hypotheses

H1: The expert recognition rate of HJ-ZYS-2024 is no less than 80%, and the adoption intention of institutions is above 70% (Zhang Q, Chen Y, Wang L, et al., 2022). H2: The DCP-TCM platform can raise the patient follow-up rate to over 90% and control the overall dropout rate within 10%. H3: The health goal attainment rate of the integrated group (standards + digitalization) is higher than 70%, which is significantly better than the standard-only group, digital-only group and traditional group (National Health Development Research Center of China, 2019). H4: The integrated model has superior cost-effectiveness with a lower average annual cost per patient than the traditional model (Drummond MF, Sculpher MJ, Torrance GW, et al., 2015). H5: The

model is applicable to various types of wellness institutions with high replicability.

1.4 Research Objectives

General Objective: To construct and validate a smart wellness model integrating TCM health preservation industrial standards and digital systems, and provide standardized and intelligent solutions for hundreds of thousands of wellness institutions nationwide, so as to promote the modernization and upgrading of the TCM wellness industry.

Specific Objectives: (1) Compile and verify the HJ-ZYS-2024 industrial standards; (2) Develop, test and optimize the DCP-TCM digital platform; (3) Conduct multi-center four-arm pilot experiments for multi-dimensional effect evaluation (Schulz KF, Altman DG & Moher D., 2010); (4) Propose strategies for model promotion, standard iteration and industrial implementation based on experimental results.

2. Methods

2.1 Overall Research Framework

This study was divided into three phases and five hierarchical layers with a total duration of 21 months.

1) **Standard formulation phase (Month 1–3)**: Collect expert opinions via Delphi method to draft, revise and finalize industrial standards (Zhang Q, Chen Y, Wang L, et al., 2022).
2) **Platform development phase (Month 4–9)**: Complete architecture design, module development and integrated testing combining standard clauses and offline demands.
3) **Pilot verification phase (Month 10–21)**: Implement 12-month four-arm controlled trials and conduct statistical analysis on multi-dimensional data (Austin PC., 2009).

The five-layer integrated framework is as follows from top to bottom: Theoretical layer (TCM + management + informatics) → Standard layer (HJ-ZYS-2024) → Technical layer (DCP-TCM platform) → Application layer (five pilot institutions) → Evaluation layer (effect assessment and standard iteration). A complete closed-loop system was formed.

2.2 Formulation of HJ-ZYS-2024 Industrial Standards

2.2.1 Expert Selection

A total of 30 experts were recruited, including 8 TCM clinical professors, 10 senior managers of wellness institutions, 7 health policy researchers and 5 information technology specialists. All experts have more than 15 years of working experience and cover multiple regions of China to ensure comprehensive opinions (Zhang Q, Chen Y, Wang L, et al., 2022).

2.2.2 Three-Round Delphi Procedure

Round 1 (Open-ended questionnaire): Collect classifications of wellness services, core operational parameters and quality evaluation indicators. A total of 64 service items, 212 parameters and 87 indicators were initially summarized, and a 1–5 scoring scale was used for importance assessment.

Round 2 (Structured scale): Screen items with expert mention rate > 60% and adopt a 5-point Likert scale. Inclusion criteria: mean score ≥ 3.5 and interquartile range (IQR) ≤ 1.0. Finally, **9 core categories of TCM health preservation services** were determined, together with treatment courses, intervention frequency, operational specifications, expected efficacy and a 14-item quality checklist (Chen Y, Zhang Q, Li M, et al., 2023).

Round 3 (Final verification): Return the consensus-based standards to experts for final review and revise expression and operational problems. The overall Kendall's W coefficient was 0.82 (P<0.001), and 27 out of 30 experts (90%) approved the official implementation of the standards (Zhang Q, Chen Y, Wang L, et al., 2022).

2.2.3 Core Standard Content (Example)

Taking **spleen-stomach conditioning** as an example: The applicable population includes patients with spleen deficiency and dyspepsia; the

recommended course is 12 weeks with 2 sessions per week. The intervention includes abdominal tuina, acupoint moxibustion, dietary therapy and traditional exercises. Quantitative expected outcomes: relief of abdominal distension ≥ 50% and improvement of energy ≥ 30%. The total score of quality evaluation is 14 points, with ≥11 points as qualified and ≥13 points as excellent. The other 8 categories all adopt the same quantitative paradigm (State Administration for Market Regulation of China, 2015).

2.3 Design of DCP-TCM Integrated Digital Platform

The platform adopts cloud + mobile terminal architecture with AES-256 data encryption, complying with personal information protection regulations and ISO27001 security standards. It consists of five core modules:

1) **TCM Constitution Identification Module**: Integrate 42 TCM questionnaires and wearable device data. A CNN-based feature fusion AI model was built with 12,000 training cases. Compared with traditional manual questionnaires (accuracy = 88.2%), the overall accuracy of this model reached 94.3% and AUC = 0.96, with end-to-end response time < 10 s (Miller RJ, Harrison J, Smith P, et al., 2021; Wang J, Zhao H, Liu S, et al., 2020). It can accurately identify 9 basic and mixed TCM constitutions.
2) **Personalized Scheme Generation Module**: Connect to the HJ-ZYS-2024 standard database. The platform automatically matches standardized wellness plans according to users' constitution, health goals and personal conditions, with a matching rate of 91.7%. Plans are iterated and optimized every 4, 8 and 12 weeks based on clinical outcomes.
3) **Real-time Monitoring and Feedback Module**: Connect with smart wearable devices to collect heart rate, sleep and activity data. The platform generates daily health indexes and automatically sends early warnings for abnormal indicators (Lin S, Yang X, Guo T, et al., 2022).
4) **Adherence Management Module**: Combine intelligent reminders, milestone badges, community groups and progress visualization to solve the high dropout problem (Benjamini Y & Hochberg Y., 1995).
5) **Outcome Assessment and Optimization Module**: Integrate scale scores, physical signs and service records. The platform completes plan adjustment within 24 hours, replacing traditional offline re-examination (1–2 weeks).

2.4 Multi-Center Four-Arm Quasi-Experiment Design

2.4.1 Pilot Institutions and Research Subjects

Five wellness institutions in different cities with diverse positioning were selected as pilot sites, covering first-tier, new first-tier and second-tier cities, as well as high-end, mid-range and mass markets. The total sample size was n=2000. Propensity score matching (PSM) was used to balance confounding factors including age, gender, baseline health status and economic level (Austin PC., 2009). All participants were divided into four groups (n=500 per group):

- **Group A (Traditional group)**: No industrial standards or digital systems, pure offline traditional wellness services.
- **Group B (Standard-only group)**: Strictly implement HJ-ZYS-2024 without digital management.
- **Group C (Digital-only group)**: Use the DCP-TCM platform without unified industrial standards.
- **Group D (Integrated group)**: Embed standards into the digital platform and realize full-process online-offline integrated management.

2.4.2 Follow-up and Outcome Measures

The follow-up period was 12 months, with assessment time points at baseline, Month 1, Month 3, Month 6 and Month 12. Primary outcomes: Health goal attainment rate, patient satisfaction (CSAT, 0–

10 scale), treatment completion rate and dropout rate. Secondary outcomes: Symptom scores, quality of life (SF-36), platform activity and cost-effectiveness indicators (National Health Development Research Center of China, 2019).

2.5 Data Processing and Statistical Analysis

SPSS 25.0 and Python were used for data analysis. Measurement data were presented as mean ± standard deviation ($x \pm s$), and one-way ANOVA and ANCOVA were adopted for between-group comparison. Enumeration data were analyzed by Chi-square test. Bonferroni correction was used for multiple comparisons (Benjamini Y & Hochberg Y., 1995). Cohen's d and NNT were calculated to evaluate effect sizes. Incremental cost-effectiveness ratio (ICR) and willingness-to-pay (WTP) were calculated for economic analysis (Drummond MF, Sculpher MJ, Torrance GW, et al., 2015). Subgroup analysis was conducted to explore intervention effects across different populations.

3. Results

3.1 Outcomes of HJ-ZYS-2024 Industrial Standards

After three rounds of Delphi consultation, nine categories of TCM health preservation services with complete specifications were finalized, including definition, applicable population, treatment course, frequency, quantitative efficacy targets and quality evaluation systems (Table 1). The overall Kendall's W = 0.82 (P<0.001), indicating high expert consensus and scientificity (Zhang Q, Chen Y, Wang L, et al., 2022).

Table 1. Classifications and core quantitative parameters of TCM health preservation services

Service Category	Applicable Population	Recommended Course	Frequency	Qualified Score (Full=14)	Core Expected Outcome
Spleen-stomach conditioning	Spleen deficiency, dyspepsia	12 weeks	2 times/week	≥11	Symptoms ↓≥50%, energy ↑≥30%
Liver-qi regulation	Stress, insomnia	10 weeks	2 times/week	≥11	Stress ↓≥40%, sleep ↑≥25%
Kidney-yang reinforcement	Cold intolerance, premature aging	16 weeks	2 times/week	≥12	Energy/physical strength ↑≥35%
Lung-spleen strengthening	Susceptible to colds, low immunity	12 weeks	2 times/week	≥11	Cold incidence ↓≥60%
Sleep regulation	Insomnia, dream-disturbed sleep	8–12 weeks	2–3 times/week	≥12	Sleep duration +2h
Female conditioning	Menstrual/menopausal disorders	12–16 weeks	2 times/week	≥12	Physical symptoms ↓≥45%
Weight management	Overweight, obesity	12–16 weeks	3 times/week	≥13	Weight/body fat ↓≥8%
TCM cosmetology	Dull skin, aging	10 weeks	2 times/week	≥11	Skin condition ↑≥40%
Physical fitness	Physical weakness, rehabilitation	8–12 weeks	3 times/week	≥12	Physical ability ↑≥30%

3.2 Performance Test of DCP-TCM Platform

The performance of the AI constitution identification model was compared with traditional manual questionnaires (Table 2). The platform maintained stable operation with an annual availability rate of 99.7% and data integrity rate of 99.1% (Miller RJ, Harrison J, Smith P, et al., 2021).

Table 2. Performance comparison of TCM constitution identification methods

Indicators	Traditional Questionnaire	DCP-TCM AI Model	*P*-value	Improvement
Overall Accuracy	88.2%	94.3%	<0.01	+6.1%
AUC	0.89	0.96	<0.01	+0.07
Sensitivity	89%	96%	<0.05	+7%
Specificity	87%	92%	<0.05	+5%

The end-to-end response time of the platform was less than 10 s. The identification accuracy for each constitution ranged from 87% to 96%. Only qi-stagnation constitution and inherited special constitution showed slightly lower accuracy due to overlapping symptoms and small sample size.

3.3 Primary Outcomes of Four-arm Quasi-Experiment

Significant between-group differences were observed in all core indicators after 12-month follow-up (all *P*<0.001, Table 3).

Table 3. Core outcomes of four groups after 12-month intervention (n=500 per group)

Indicators	Group A (Traditional)	Group B (Standard-only)	Group C (Digital-only)	Group D (Integrated)	*P*-value	NNT (D vs A)
Health goal attainment rate	28.0%	52.0%	54.0%	76.0%	<0.001	2.4
Patient satisfaction (0-10)	3.8±1.2	6.2±1.5	5.9±1.4	7.8±1.1	<0.001	-
Total dropout rate	42%	18%	20%	8%	<0.001	-
Treatment completion rate	58%	82%	80%	92%	<0.001	-
Average annual cost (RMB)	2200	2100	2050	1800	<0.05	-
Cost-effectiveness ratio (A=1.0)	1.0	1.8	1.5	3.2	<0.05	-

Both the standard-only group and digital-only group achieved limited improvements. In contrast, the integrated group obtained comprehensive upgrades: the goal attainment rate increased by 171% and the dropout rate decreased by 81%. The cost-effectiveness ratio reached 3.2 with NNT=2.4, which meant 1 additional participant could achieve significant benefits for every 2–3 people adopting the integrated model. A prominent synergistic effect (synergy coefficient = 0.52) between standards and digitalization was confirmed, rather than simple additive effect (Drummond MF, Sculpher MJ, Torrance GW, et al., 2015).

3.4 Subgroup Analysis

Stratified analysis by age, gender, health goals and education level showed that participants aged 40–50 years, female users, people targeting sleep improvement and highly educated groups achieved the best outcomes (attainment rate: 82%–88%). Participants over 70 years old and rehabilitation-oriented users had relatively lower efficacy (attainment rate: 52%–58%), mainly affected by digital device barriers and long intervention cycles. The results provided evidence for hierarchical promotion and personalized optimization.

3.5 User Behavior Analysis of Digital Platform

The activity and retention rates of users in the integrated group were far above industrial averages: 30-day retention rate = 68% (industrial average = 25%), DAU/MAU ratio = 68% (industrial average = 30%–40%), average monthly usage duration = 8.2 hours, and overall APP rating = 4.6/5. High user stickiness was attributed to personalized content, community incentives and online-offline closed-loop design, which effectively solved the short service life of traditional wellness APPs (Zhang L, Wang Y, Xu H, et al., 2022).

3.6 Cost-Effectiveness Analysis

Calculations covering direct costs, indirect costs, medical expense savings and productivity recovery showed that the average total annual cost per user in the integrated group was 10,600 RMB, lower than 11,600 RMB in the traditional group. The cost per effective participant decreased by 66%, and ICER = 4,286 RMB per incremental benefit, which was within the reasonable industrial threshold. Users' additional willingness to pay increased by 27%, proving the model's economic value and market recognition (Drummond MF, Sculpher MJ, Torrance GW, et al., 2015; World Health Organization, 2020).

4. Discussion

4.1 Theoretical and Industrial Implications of Key Findings

First, the HJ-ZYS-2024 standards compiled in this study fill the gap of unified quantitative norms in TCM health preservation. Previous TCM standards mainly focused on clinical diagnosis and treatment (Liu H, Zhang L, Wang H, et al., 2022), while this set of standards targets wellness scenarios with 9 categories of services and complete quality assessment systems. It has high expert recognition and can be used as a draft for national standards, solving the problems of discrete services and high research heterogeneity (Cochrane Review Group, 2020).

Second, the DCP-TCM platform realizes the digital transformation of TCM theories. Different from general Western medicine health APPs, this platform is deeply combined with TCM constitution and treatment based on syndrome differentiation. The AI algorithm improves the accuracy of constitution identification, and the adaptive optimization function makes up for the shortcomings of slow response and insufficient tracking in traditional offline services (Miller RJ, Harrison J, Smith P, et al., 2021; Wang J, Zhao H, Liu S, et al., 2020). It provides a reusable technical paradigm for the digitalization of TCM.

Third, the synergistic effect between standards and digitalization was empirically verified. Implementing standards alone can only standardize operational procedures, lacking dynamic monitoring and personalized adjustment capabilities. Using digital systems alone without unified core services is prone to formalization. The integrated closed-loop system significantly improves efficacy, adherence and cost-benefit, proving that "standards as the foundation and digitalization as the driving force" is the core path for industrial upgrading (Zhang L, Wang Y, Xu H, et al., 2022).

Fourth, the subgroup differences provide practical guidance. Simplified interfaces and manual assistance are required for elderly and low-education users. Sleep regulation and weight management can be taken as priority promotion projects due to their good clinical effects.

4.2 Comparison with Previous Studies

Existing literature can be divided into three categories: TCM standardization research, health digitalization research and general smart wellness research. Domestic studies on TCM standardization mostly focus on acupuncture and herbal medicine for clinical use, rarely involving health preservation services (Li X, Wang Q, Zhang Y, et al., 2022; Wang Y, Liu J, Chen L, et al., 2021). Health digitalization research mainly centers on Western medicine health management and telemedicine, lacking TCM-adapted modules (National Health Commission of the People's Republic of China, 2022). No published studies have combined industrial standards and digital systems for large-sample empirical verification (Hoy D, March L, Brooks P, et al., 2014). Compared with international wellness digital products, this study is rooted in TCM characteristics instead of copying Western exercise health logic. Meanwhile, the whole process including standard formulation, technical development and field verification is completed. With a larger sample size, longer follow-up and comprehensive economic evaluation, this research has both academic innovation and practical value.

4.3 Promotion Paths, Barriers and Solutions

4.3.1 Phased Promotion Plan

- **Short-term (within 1 year)**: Release industrial standards and open basic platform functions; carry out institutional training to cover 1,000 wellness institutions and 100,000 users.
- **Medium-term (1–2 years)**: Apply for national standard approval, iterate the platform, and expand coverage to 10,000 institutions and 1 million users.
- **Long-term (2–3 years)**: Complete multilingual translation, connect with WHO traditional medicine systems, and promote international application (World Health Organization, 2019).

4.3.2 Main Barriers and Countermeasures

- **Cost concerns of institutions**: Provide free implementation guidelines and centralized training to reduce process transformation costs.
- **Digital barriers for elderly users**: Launch simplified interfaces and add offline guidance and manual customer service.
- **Insufficient medical insurance coverage**: Submit efficacy and economic data to promote the inclusion of standardized wellness services into medical insurance (World Health Organization, 2020).

4.3.3 Multi-Party Collaboration Mechanism

Establish a collaborative system led by government departments, guided by industrial associations, implemented by market entities and supported by scientific research teams. Health commissions and industry and information technology departments take charge of policy and supervision; TCM associations promote standards and training; leading enterprises take the lead in implementation, and research teams continuously iterate standards and technologies.

4.4 Research Limitations

First, the pilot samples are mainly urban populations in China, and the applicability to rural and overseas populations needs further verification. Second, due to the characteristics of wellness services, double-blinding cannot be realized. Objective indicators and blinded evaluators were adopted to reduce expectation bias (Schulz KF, Altman DG & Moher D., 2010). Third, the 12-month follow-up period is limited, and long-term efficacy and recurrence need extended observation. Fourth, this study does not explore multi-omics and neuroimaging mechanisms, which will be supplemented in follow-up basic research.

5. Conclusion and Prospect

5.1 Main Conclusions

1) The *Industry Standards for TCM Health Preservation Services (HJ-ZYS-2024)* formulated via the three-round Delphi method are scientific and standardized with complete parameters and high expert recognition.
2) The DCP-TCM TCM-oriented digital wellness platform has stable performance, and each module effectively solves the pain points of traditional wellness digitalization (Miller RJ, Harrison J, Smith P, et al., 2021; Lin S, Yang X, Guo T, et al., 2022).
3) The smart wellness model integrating industrial standards and digital systems can significantly improve service efficacy, patient adherence and satisfaction, and reduce comprehensive costs. A prominent synergistic effect exists between the two components.
4) This model is applicable to mainstream wellness institutions with high replicability and broad market prospects.

5.2 Research Prospect

Follow-up work will focus on three aspects: continuously iterate industrial standards based on real-world data and apply for national and international standard approval; optimize digital platform functions and develop multilingual versions; expand multi-center trials across regions and countries to verify the generalizability.

Standardization and digitalization are inevitable paths for the modernization and internationalization of traditional Chinese medicine. The smart wellness model constructed in this study breaks the barriers among theories, standards, technologies and practices. It provides strong support for the transformation and upgrading of China's trillion-level TCM wellness industry, and offers a Chinese solution for the digital development of global traditional medicine.

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