

Perceptions and Behaviors of Young Adults toward Traditional Chinese Medicine Wellness Centers: A K-Means Clustering Analysis based on Evidence from Shandong Province, China

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Abstract

Against the backdrop of the Healthy China initiative, Traditional Chinese Medicine (TCM) wellness centers, as an emerging service model, have garnered significant attention through the integration of traditional wellness philosophy with modern health management, youth-oriented new products, and innovative marketing methods. Targeting young adults aged 18–34 in Shandong Province, China, this study obtained 388 valid responses via in-depth interviews and structured questionnaires. Employing K-means cluster analysis, respondents were categorized into three groups with low, medium, and high consumption propensity based on 4 dimensions, and corresponding user profiles were constructed. The results reveal that young adults generally experience sub-health conditions and exhibit a contradictory wellness behavior pattern of "simultaneous depletion and remediation," commonly referred to as "punk wellness" (an ironic consumer paradox). Their demand for TCM wellness centers is primarily oriented toward preventive health care but is constrained by cognitive deficits and accessibility barriers. Based on the clustering results, this study proposes targeted recommendations encompassing education and communication, service innovation, and the 4Ps marketing mix to promote the youth-oriented and sustainable development of TCM wellness centers.

Keywords

Traditional Chinese Medicine (TCM) Wellness Centers; Young Consumers; K-means Clustering; Consumer Profiling; Brand Communication.

1. Introduction

Traditional Chinese Medicine (TCM) culture constitutes an essential component of China's traditional heritage. In recent years, the spread of traditional Chinese medicine culture has been expanding steadily, and the TCM wellness market has also been growing by leaps and bounds. Concurrently, accelerated urbanization and intensifying socio-economic pressures have exacerbated physical sub-health and psychological distress among contemporary youth. As wellness philosophies become deeply institutionalized into everyday life, the TCM wellness market has evolved into a strategic nexus of consumer behavior and cultural identity.

Against this backdrop, the convergence of youth self-care practices with traditional TCM wellness has emerged as a notable trend. Young people have developed unique self-care mechanisms by combining seemingly contradictory behaviors with TCM conditioning principles-such as "applying herbal facial masks after staying up late" or "taking liver-protective supplements while drinking alcohol." However, current TCM wellness services and research predominantly target middle-aged or elderly populations, while comparatively

limited attention is devoted to youth. Influenced by digital lifestyles, young adults exhibit highly differentiated and personalized perceptions, attitudes, and behaviors toward wellness, rendering traditional service content and communication channels ineffective in reaching them. Furthermore, existing research tends to be confined to single perspectives, lacking systematic studies that integrate behavioral psychological theories with data modeling methodologies. Consequently, the formation mechanisms of youth TCM wellness consumption behavior and corresponding service optimization strategies remain under-theorized, necessitating empirical research support.

2. Literature Review

Existing research has explored the mechanisms of interaction between young consumers and the traditional Chinese medicine wellness industry from multiple perspectives, focusing primarily on policy drivers, market transformation, behavioral characteristics, and pathways for industrial innovation, thereby providing a theoretical foundation and empirical references for this study.

Institutional and regional policies serve as critical drivers for the youth-oriented transformation of the TCM wellness industry. Zhang et al. (2017) analyzed the opportunities and strategies for the TCM grand health industry, identifying TCM health services as encompassing wellness, health maintenance, medical treatment, and rehabilitation, forming a cross-sector industrial chain involving herbal cultivation, product research and development, production, distribution, and sales. They contended that under the Healthy China initiative, the modernization of TCM has accelerated the industry's transition from conventional modalities toward holistic health services. From a regional perspective, Wang et al. (2024) deployed a SWOT framework to evaluate the TCM wellness ecosystem in Shandong Province, identifying salient geographical advantages and rich botanical resources alongside systemic bottlenecks such as lagging standardization and intensifying market friction. Zhang and Luo (2011) approached the issue from the perspective of Preventive Health Preservation (Zhi Wei Bing), highlighting the holistic concepts and preventive care strengths of TCM, and noting that this philosophy can alleviate the burden on the healthcare system by promoting a shift from treatment-oriented to prevention-oriented approaches. While these studies provide valuable policy-level insights for the present research, they remain largely confined to macro-level industrial perspectives with limited micro-level empirical analysis of consumer behavior.

Punk wellness is a young adult subculture that has developed its own unique consumption patterns and market mechanisms. Hu et al. (2019) used qualitative interviews to unpack punk wellness and identified a compromised, paradoxical individualism that typified this socio-cultural practice. Liu (2023) used a subcultural approach with semi-structured interviews, participant observation, and textual analysis to investigate punk wellness consumption, and paradoxical meme usage and wellness display behavior. This study also showed that the combination of social acceleration and consumerism led young adults to consciously indulge in order to gain self-discipline and the right to protest. Wang (2017) examined the creation of a new type of health anxiety in young adults, and noted that self-media platforms championed a new type of wellness information in short, youth-friendly videos. This construction was aided by a relaxation of rules that allowed the dissemination of pseudo-medicine and consumption enhancements. Meng (2019) claimed that the traditional wellness market was embedded in a transformation in traditional Chinese culture, and older young adults moved from "refined wellness" to "instant nourishment." Although these studies have expanded our knowledge of the psychology of young people, they have mostly been qualitative analyses and lack quantitative model applications.

In terms of research on industrial innovation and the alignment of supply and demand, Yan (2019) recognized the systemic nature of TCM wellness culture. In the context of the Healthy China initiative, it can be considered as one of the elements of the best traditional culture, and the initiative can provide support for its inheritance and innovative development. In the context of the functioning public opinion environment, Tian (2022) criticized the media's promotion of the sub-health phenomenon. This creates marketing opportunities for wellness products and encourages consumption among the youth, while also presenting problems of market disorder in the industry. From a societal perspective, Dong and Deng (2017) addressed the problematic phenomenon of the elitization of health (the meaning of which is Medicalization) and the distortion of youth values. From a consumer perspective, Huang (2021) showed that the repeated and mismanaged forms of health communication encourage the youth to spend money on wellness products.

In summary, existing literature has systematically examined the trend toward a younger demographic in the traditional Chinese medicine wellness industry from the perspectives of policy and the market, consumer behavior, innovation, and cultural integration. However, most studies adopt a national or international perspective, and there is a lack of empirical research on young people's perceptions and behaviors—particularly a lack of systematic analysis that integrates behavioral psychology theories with data modeling. This study aims to reduce these deficits. The empirical data of this study have been collected from Shandong Province, China. By integrating behavioral psychology theories with our data, this research will apply K-means clustering and consumer profiling in the context of the youth TCM wellness market, and provide development-related recommendations of high degree for market sustainability.

3. Research Design

3.1. Research Subjects and Data Collection

This study targeted young consumers aged 18–34 residing in Shandong Province, China. Using consumer behavior theories: the Cognition-Attitude-Behavior Model (C-A-B Model) and the Theory of Planned Behavior (TPB), our study purpose is to understand the mechanisms of young consumers' behaviors towards wellness TCM consumption. Our focus is on this group's perceptions of TCM wellness centers, consumption motivations, and consumption characteristics. Young adults aged 18–34 are at a critical stage in their academic and career development. They have strong and diverse health needs and exhibit high consumer spending power. The sample was selected using a stratified random sampling method, taking into comprehensive consideration the economic development levels of cities within Shandong Province to ensure the data representativeness. The planned sample size is 300 or more. Data were collected through a combination of online and offline surveys.

3.2. Variable Design

In-depth Interviews

Prior to the large-scale quantitative survey, exploratory in-depth semi-structured interviews were conducted to ground the subsequent quantitative indicators in rich contextual insights. A purposive sampling strategy was employed to recruit a diverse cohort of ten young adults with heterogeneous educational and disciplinary backgrounds, ensuring thematic saturation. The granular demographic profiles of these informants, juxtaposed with the corresponding semi-structured interview protocol, are systematically cataloged in Table 1.

Table 1. Respondent Information and Interview Protocol

No.	Gender	Education	Major	Interview Protocol
1	Male	Bachelor	Business Admin.	(1) Please briefly introduce your age, occupational, academic background, and daily health management habits.
2	Female	Bachelor	AI	(2) Are you familiar with TCM wellness centers? What is your overall perception? How did you first learn about them?
3	Male	Associate	Business English	(3) What distinctions do you perceive between TCM wellness centers and traditional TCM hospitals or Western clinics?
4	Male	Bachelor	Construction Eng.	(4) Describe your most recent visit to a TCM wellness center. What motivated your choice?
5	Female	Associate	Nursing	(5) What factors do you prioritize when consuming TCM wellness products or services? Why?
6	Female	Graduate	History	(6) How do your family, friends, or social environment influence your consumption of TCM wellness services?
7	Male	Graduate	TCM	(7) What barriers hinder your increased consumption of TCM wellness services? How could these be overcome?
8	Female	Bachelor	Chinese Lit.	(8) How would you evaluate innovative elements at TCM wellness centers? Would this increase your willingness to consume?
9	Female	Bachelor	Law	(9) Based on your experience, what is your satisfaction level? What specific improvements are needed?
10	Male	Graduate	Electrical Eng.	(10) What are your expectations for the future development of TCM wellness centers?

Integrating the results of the in-depth interviews with the Theory of Planned Behavior and the Cognition-Attitude-Behavior model, we identified four dimensions of this study—cognition, behavior, intention, and demographic characteristics—and their constituent elements, as shown in Table 2:

- (1) The cognition dimension refers to youth's understanding and awareness of TCM wellness centers, primarily including perceptions of TCM cultural connotations, recognition of TCM wellness for health protection, and understanding of TCM wellness center business models.
- (2) The behavior dimension represents consumption practices driven by motivation, further divided into consumption frequency and satisfaction evaluation.
- (3) The willingness dimension refers to individuals' relatively stable psychological tendencies toward TCM wellness centers, mainly including consumption willingness intensity and consumption amount.
- (4) The demographic traits describe age, gender, education level, and consumption capacity.

Using levels of characteristics, dimensions, and differences of groups and dispersions, combined with the relevant background and behavior of consumption pertaining to the context, reasonable differentiation pertaining to this group's characteristics may be constructed. We then developed a questionnaire for quantitative research based on these four dimensions.

Table 2. Questionnaire Dimensions and Element Composition

Dimension	Elements
Cognition Characteristics	Cultural Connotation; Health Protection; Business Model
Behavior Characteristics	Consumption Frequency; Satisfaction Level
Willingness Characteristics	Willingness Intensity; Consumption Amount
Demographic Characteristics	Gender; Education; Major; Consumption Capacity

4. Results and Analysis

4.1. Sample Characteristics Overview

465 questionnaires were received via mixed channels. 360 via the online channel and 105 via the offline channel. The 388 samples were accepted as valid after abnormal data detection and a thorough data scrutiny process with an 83.4% valid response rate. The final analytical sample is gender-balanced and representative, with 181 males (46.6%) and 207 females (53.4%). 103 respondents possess an associate degree or lower (26.5%), 204 respondents received a bachelor's degree (52.6%), and 81 respondents hold a graduate degree or higher (20.9%).

4.2. Questionnaire Reliability and Validity Testing

To ensure the quality of the scale, we conducted reliability and validity assessments of the questionnaire.

Reliability is usually assessed in terms of the value of Cronbach's alpha coefficient. In this questionnaire, all coefficients of Cronbach's alpha with respect to the standardized items were above the level of 0.8. Thus, the overall design of the questionnaire was reasonably correct. The results of the survey provide evidence of relevant reliability and validity adequate for the analysis.

Table 3. Reliability Test

Dimension	Items	Cronbach's Alpha	Reliability
Cognition Characteristics	RZ1, RZ2, RZ3	0.923	Excellent
Behavior Characteristics	XW1, XW2	0.893	Good
Willingness Characteristics	YY1, YY2	0.867	Good

Construct validity and dataset suitability for structural analysis were further evaluated using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity, with results reported in Table 4. The KMO statistic reached 0.956, substantially surpassing the conventional threshold of 0.70, indicating a superb degree of common variance among the items. Furthermore, all item communality values systematically exceeded 0.70, showing that each indicator was effectively extracted and sufficiently represented within the conceptual framework.

Table 4. Validity Test

Test	Statistic	Value
KMO: Measure of Sampling Adequacy	——	0.956
Bartlett's Test of Sphericity	Approx. Chi-Square	16650.993
	df	435
	Sig.	0.000

4.3. Cross-Tabulation Analysis and Demographic Heterogeneity

To systematically explore the variance in consumer preferences, a cross-tabulation analysis was conducted to examine the intersection between three primary demographic variables (gender, educational attainment, and academic major) and six distinct categories of TCM derivative products and services: (1) herbal skincare and cosmetic products, (2) TCM cultural and creative products, (3) experiential TCM cultural co-creation, (4) herbal-infused functional beverages (tea/coffee), (5) TCM dietary therapy products, and (6) TCM beauty and therapeutic services.

The data show that younger populations in Shandong Province generally exhibit a strong tendency towards consuming TCM. The total number of respondents who said they were “willing” and “very willing” ranged between 65.5% and 72.4% of the total respondents in all cases. The highest acceptance (72.4%) was for TCM dietary therapy products, followed by acceptance of herbal milk tea or coffee (68.3%) and herbal skincare or cosmetic products (68.0%). The data show that there are young consumers who want to buy TCM wellness products, and there are vast unpacked opportunities and market capacity in TCM.

Coinciding with the cross-tabulation analysis, the pronounced behavioral heterogeneity propelled by demography can be traced. In the case of gender, female respondents had a much stronger tendency towards the preference of TCM beauty services, herbal functional beverages, and hands-on cultural co-creation. However, male respondents had a stronger tendency in consumption towards TCM dietary therapy products. Concerning education, undergraduate respondents were the most active, demonstrating greater consumption across most categories of products. Besides this, there were highly pronounced variations by discipline. Fine arts and design students had the greatest preference for TCM beauty services and hands-on cultural making. The science and engineering students showed a preference towards functional herbal skin care and cultural products, which were standardized. However, students in the business, economics, and management disciplines showed greater preference and higher potential for new products and herbal functional tea and coffee products. The detailed empirical distributions for each of the cross-analyses are structurally documented in Appendix Tables 1 through 6.

Appendix Table 1. Cross-Analysis of Consumption Willingness for Herbal Skincare and Cosmetic Products by Gender, Education, and Major

Consumption Willingness	Overall	Gender		Education			Major						
		M	F	Assoc.	Bach.	Grad.	Med.	Sci.	Lit.	Art	Bus.	PE	Other
All respondents	388	181	207	103	204	81	81	89	58	31	97	19	13
Very Unwilling	4.12	3.87	4.35	2.91	4.41	4.94	7.41	2.25	3.45	6.45	3.09	5.26	-
Unwilling	7.22	6.08	8.21	10.68	5.39	7.41	9.88	6.74	5.17	6.45	7.22	5.26	7.69
Neutral	20.62	22.65	18.84	25.24	18.63	19.75	20.99	16.85	18.97	25.81	21.65	36.84	7.69
Willing	34.28	33.70	34.78	29.13	33.82	41.98	32.10	31.46	32.76	29.03	39.18	31.58	53.85
Very Willing	33.76	33.70	33.82	32.04	37.75	25.93	29.63	42.70	39.66	32.26	28.87	21.05	30.77
Total(%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix Table 2. Cross-Analysis of Consumption Willingness for TCM Cultural and Creative Products by Gender, Education, and Major

Consumption Willingness	Overall	Gender		Education			Major						
		M	F	Assoc.	Bach.	Grad.	Med.	Sci.	Lit.	Art	Bus.	PE	Other
All respondents	388	181	207	103	204	81	81	89	58	31	97	19	13
Very Unwilling	6.70	6.63	6.76	6.80	5.88	8.64	9.88	5.62	3.45	9.68	6.19	10.53	-
Unwilling	7.99	8.29	7.73	7.77	6.86	11.11	12.35	6.74	6.90	3.23	8.25	10.53	-
Neutral	19.85	17.13	22.22	14.56	24.02	16.05	17.28	14.61	20.69	25.81	22.68	10.53	46.15
Willing	35.05	38.67	31.88	36.89	32.84	38.27	35.80	42.70	25.86	38.71	36.08	26.32	15.38
Very Willing	30.41	29.28	31.40	33.98	30.39	25.93	24.69	30.34	43.10	22.58	26.80	42.11	38.46
Total(%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix Table 3. Cross-Analysis of Consumption Willingness for Experiential TCM Cultural and Creative Product Making by Gender, Education, and Major

Consumption Willingness	Overall	Gender		Education			Major						
		M	F	Assoc.	Bach.	Grad.	Med.	Sci.	Lit.	Art	Bus.	PE	Other
All respondents	388	181	207	103	204	81	81	89	58	31	97	19	13
Very Unwilling	5.67	4.42	6.76	6.8	4.41	7.41	6.17	7.87	3.45	9.68	3.09	10.53	-
Unwilling	7.22	8.29	6.28	8.74	4.9	11.11	9.88	3.37	3.45	6.45	9.28	5.26	23.08
Neutral	19.59	21.55	17.87	23.3	17.65	19.75	23.46	12.36	24.14	29.03	18.56	21.05	7.69
Willing	37.89	34.25	41.06	31.07	43.63	32.1	29.63	41.57	37.93	29.03	41.24	42.11	53.85
Very Willing	29.64	31.49	28.02	30.1	29.41	29.63	30.86	34.83	31.03	25.81	27.84	21.05	15.38
Total(%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix Table 4. Cross-Analysis of Consumption Willingness for Herbal Milk Tea or Coffee Products by Gender, Education, and Major

Consumption Willingness	Overall	Gender		Education			Major						
		M	F	Assoc.	Bach.	Grad.	Med.	Sci.	Lit.	Art	Bus.	PE	Other
All respondents	388	181	207	103	204	81	81	89	58	31	97	19	13
Very Unwilling	7.73	7.18	8.21	8.74	5.88	11.11	11.11	6.74	6.9	3.23	6.19	15.79	7.69
Unwilling	7.73	8.29	7.25	9.71	5.88	9.88	9.88	6.74	5.17	3.23	9.28	10.53	7.69
Neutral	16.24	17.68	14.98	17.48	19.12	7.41	16.05	19.1	6.9	38.71	15.46	5.26	7.69
Willing	35.05	33.7	36.23	30.1	36.27	38.27	37.04	33.71	36.21	32.26	30.93	47.37	46.15
Very Willing	33.25	33.15	33.33	33.98	32.84	33.33	25.93	33.71	44.83	22.58	38.14	21.05	30.77
Total(%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix Table 5. Cross-Analysis of Consumption Willingness for TCM Dietary Therapy Products by Gender, Education, and Major

Consumption Willingness	Overall	Gender		Education			Major						
		M	F	Assoc.	Bach.	Grad.	Med.	Sci.	Lit.	Art	Bus.	PE	Other
All respondents	388	181	207	103	204	81	81	89	58	31	97	19	13
Very Unwilling	9.02	6.63	11.11	11.65	7.84	8.64	13.58	8.99	5.17	3.23	7.22	15.79	15.38
Unwilling	4.38	4.42	4.35	3.88	4.9	3.7	4.94	3.37	5.17	3.23	5.15	5.26	-
Neutral	14.18	14.36	14.01	18.45	12.25	13.58	16.05	15.73	8.62	16.13	15.46	10.53	7.69
Willing	34.54	33.15	35.75	40.78	29.9	38.27	30.86	32.58	37.93	35.48	32.99	42.11	53.85
Very Willing	37.89	41.44	34.78	25.24	45.1	35.8	34.57	39.33	43.1	41.94	39.18	26.32	23.08
Total(%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Appendix Table 6. Cross-Analysis of Consumption Willingness for TCM Beauty Services by Gender, Education, and Major

Consumption Willingness	Overall	Gender		Education			Major						
		M	F	Assoc.	Bach.	Grad.	Med.	Sci.	Lit.	Art	Bus.	PE	Other
All respondents	388	181	207	103	204	81	81	89	58	31	97	19	13
Very Unwilling	5.93	6.08	5.8	7.77	4.9	6.17	1.23	4.49	6.9	12.9	6.19	15.79	7.69
Unwilling	9.54	9.39	9.66	9.71	8.82	11.11	12.35	7.87	8.62	9.68	11.34	5.26	-
Neutral	18.81	21.55	16.43	18.45	17.16	23.46	27.16	15.73	17.24	9.68	15.46	15.79	46.15
Willing	30.67	28.73	32.37	33.01	27.45	35.8	37.04	30.34	36.21	19.35	28.87	26.32	15.38
Very Willing	35.05	34.25	35.75	31.07	41.67	23.46	22.22	41.57	31.03	48.39	38.14	36.84	30.77
Total(%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

4.4. Cluster Analysis

K-means clustering, a classic unsupervised learning algorithm proposed by MacQueen in 1967, is primarily used to partition a dataset into K non-overlapping subsets by minimizing within-cluster variance. The core of this method lies in iteratively optimizing cluster centers to achieve automatic grouping of data points, offering the advantages of high computational efficiency and ease of implementation. In practice, K-means is widely applied in market segmentation—for instance, constructing customer profiles based on consumer behavior data to facilitate precision marketing.

4.4.1 Determination of Cluster Number

To make sure of the mathematical precision of the consumer segmentation, the Elbow Method and the Silhouette Coefficient were used simultaneously in this study to find the best number of clusters (K). The clustering algorithm measures the distance of individual behavioral vectors using the standard Euclidean distance, which is expressed as:

$$d(x, y) = \sqrt{\sum_{i=1}^n (x_i - y_i)^2}. \quad (1)$$

(Where n denotes the number of measurement indicators, and x_i and y_i represent the coordinate values of the respective sample points.)

The primary objective function of the K-means algorithm is to minimize the Within-Cluster Sum of Squares (WCSS), which serves as the core criterion for the Elbow Method and is mathematically defined as:

$$WCSS = \sum_{j=1}^K \sum_{i \in C_j} \|x_i - \mu_j\|^2 \quad (2)$$

(Where K signifies the total number of clusters, C_j denotes the j -th cluster cohort, and μ_j corresponds to the geometric centroid of cluster C_j .)

Simultaneously, the Silhouette Coefficient ($s(i)$) was calculated to evaluate the structural separation and cohesion of the clustering configurations. The coefficient for an individual sample i is expressed as follows:

$$s(i) = \frac{b(i) - a(i)}{\max\{a(i), b(i)\}} \quad (3)$$

(where $a(i)$ represents the mean intra-cluster distance from sample i to the other points within its own cluster, reflecting cluster cohesion. Conversely, $b(i)$ signifies the mean nearest-cluster distance from sample i to all points in the closest neighboring cluster, reflecting cluster separation.)

Based on these mathematical formulations, Figure 1 presents the elbow method used to determine the optimal number of clusters. The elbow in the figure appears near $K=3$ or $K=4$. Consequently, $K = 3$ was statistically established as the optimal cluster configuration, ensuring both high mathematical stability and robust theoretical interpretability for subsequent analysis.

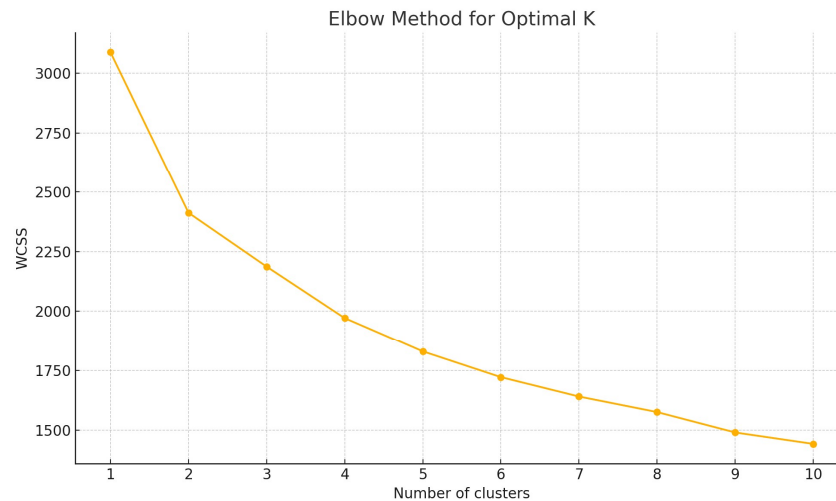


Figure 1. The optimal number of clusters K determined by the elbow method

4.4.2 Clustering Results and Segment Analysis

Table 5. Clustering Results

Indicator		Cluster 1	Cluster 2	Cluster 3
Demographic characteristics	Gender	1.37	1.66	1.63
	Education	2.22	2.11	1.92
	Major	3.22	4.97	1.96
	Consumption Capacity	2.22	2.39	2.25
Cognition Characteristics		1.47	2.76	3.895
Behavior Characteristics		1.50	3.01	4.02
Willingness Characteristics		2.41	3.67	4.04

Table 5 contains data on empirical cluster centroids produced by the K-means algorithm. As shown in Table 5, based on the mathematical intersection of the respondents' cognitive, behavioral, and psychological willingness metrics, the youth consumer market is distinctively segmented into three clusters (cohorts):

Cluster 1, yielding a willingness baseline of 2.41, represents the low consumption willingness group; Cluster 2, with a consumption willingness score of 3.67, represents the medium consumption willingness group; and Cluster 3, scoring 4.04, represents the high consumption willingness group. Based on the K-means clustering results, this study systematically mapped the user profiles of these three young consumer segments onto specific marketing mix strategies (the 4P framework), namely Product, Price, Place, and Promotion, as detailed below:



Figure 2. Schematic profile of the low consumption willingness group

Cluster 1 - Low Consumption Group: Male, bachelor's degree, business and economics major, monthly living expenses 2,000–3,000 RMB. This group of people exhibits deficient cognitive awareness and low consumption willingness toward TCM wellness centers. In their discretionary daily routines, they allocate negligible cognitive attention to health-preservation content, resulting in a pronounced state of information asymmetry and high acceptance barriers. Consequently, the primary strategic marketing challenge for this segment resides in overcoming pronounced cognitive inertia and severe brand distrust; absent targeted educational intervention and proactive value-seeding, this cohort is highly unlikely to transition into active consumers.



Figure 3. Schematic profile of the medium consumption willingness group

Cluster 2 - Medium Consumption Group: Female, bachelor's degree, arts major, monthly living expenses 2,000–3,000 RMB. This group demonstrates a relatively elevated cognitive awareness and medium consumption willingness toward TCM wellness centers, proactively seeking TCM wellness knowledge, with prior experience or consumption history, making choices based on their own understanding. This group has preliminary consumption experience but lacks emotional connection and continuity, reflecting insufficient cultural resonance and the absence of personalized services. The fundamental commercial hurdle for Cluster 2 lies in an inadequate trial-to-repurchase conversion rate, necessitating deep cultural integration and experiential product-seeding to transform them into a stable, high-retention consumer core.



Figure 4. Schematic profile of the high consumption willingness group

Cluster 3 - High Consumption Group: Female, bachelor's degree, science and engineering major, monthly living expenses 2,000–3,000 RMB. This group demonstrates high awareness of

TCM wellness centers, aggressively pursues hyper-personalized wellness solutions, and exhibits an accelerated affinity for premium derivative programs. With strong consumption capacity, they value quality and service experience and are willing to pay a premium for high-quality TCM wellness products and services, demonstrating a high premium readiness for authentic TCM-infused offerings. Although this group possesses high awareness and strong consumption capacity, their pursuit of personalization and premium experiences reflects insufficient standardized service supply and weak loyalty mechanisms. The key marketing challenge lies in how to transition from one-time consumption to long-term membership loyalty, requiring technological innovation to consolidate their leading position. And construct high-retention membership ecosystems, utilizing technological and experiential innovation to consolidate brand stickiness.

5. Recommendations

Based on the empirical taxonomies derived from the K-means cluster analysis, this study leverages the classic 4Ps marketing mix framework and structurally integrates the distinct Traditional Chinese Medicine (TCM) heritage of Shandong Province to formulate regionally adaptive, precision-targeted marketing strategies. These strategies aim to promote brand communication, digital transformation, and deep integration with youth groups for TCM wellness centers, achieving sustainable youth-oriented development of Shandong's TCM wellness industry.

5.1. Recommendation 1: Cognitive Awakening and Low-Barrier Entry Service Optimization for the Low Consumption Willingness Group

Table 6. 4P Precision Marketing Strategy for the Low Consumption Willingness Group

4P Elements	Targeted Marketing Strategy	Policy & Cultural Integration	Expected Marketing Effect
Product	Develop a Bian Que Preventive Health Preservation (Zhi Wei Bing) introductory experience package including basic care with E jiao (a Shandong authentic medicinal material). Include simple dietary recipes based on the "Lu Ten Herbs" (Ten Iconic Shandong Medicinal Herbs).	Aligning with the "Quality Shandong Medicine" initiative and Bian Que's ancestral birthplace Preventive Health Preservation (Zhi Wei Bing) philosophy.	Lowering cognitive barriers and minimizing initial trial friction
Price	Low-Barrier Trial Pricing: A single-experience introductory pricing model based on youth budgets at 50–100 RMB.	Matching the discretionary spending capacity of youth demographics to dismantle financial thresholds.	Accelerating initial user acquisition and conversion rates
Place	Use digital media platforms such as Douyin (China's version of TikTok) and WeChat mini-programs to accurately target the common young adult consumption scenarios.	Catalyzing the digital transformation and service integration of the regional health-tech and medical wellness sector.	Expanding physical-to-digital service accessibility and user touchpoints
Promotion	Launch Campaigns for Introduction to Bian Que Wellness Short-form Product. These micro-videos will captivate audiences and explain Qilu Medical Culture while promoting TCM.	Enhancing regional TCM cultural brand communication and increasing brand equity	Enhancing brand awareness and favorability

The cognition score for the group with low consumption willingness was just 1.47. Their behavior score was 1.50 and their score on consumption willingness was 2.41. This group has little recognition of TCM wellness centers. They attend to related issues in their daily life to a

lesser degree, have superficial cognition, and are likely to stay entangled in the contradictory “punk wellness” practices without solidifying consumption practices. The low-barrier entry strategy is appropriate for the cognitive problems identified. The elaborated 4P precision marketing strategies are included in Table 6.

5.2. Recommendation 2: In-Depth Cultural Marketing and Personalized Experience Enhancement for the Medium Consumption Willingness Group

The group showing medium consumption willingness had a cognition score of 2.76, behavior score of 3.01, and consumption willingness score of 3.67. This group has a moderate level of awareness, but the consumption frequency is fair, with satisfaction levels of the group showing medium consumption willingness still remaining low. This group has a practical approach that is cost-value oriented but lacks emotional involvement, resulting in consumption that is intermittent and mostly due to work-related stress. To strengthen cultural resonance and customer retention, a deep-engagement strategy should be implemented. The specific 4P precision marketing strategies are presented in Table 7.

Table 7. 4P Precision Marketing Strategy for the Medium Consumption Willingness Group

4P Elements	Targeted Marketing Strategy	Policy & Cultural Integration	Expected Marketing Effect
Product	Launch the “Confucian Physician Wellness Capital” Tailored Wellness Solutions, integrating the Qilu Confucian physician philosophy of “harmony between humanity and nature” with smart health monitoring wearables.	Complying with the provincial “TCM + Cultural Tourism Integration” guidelines and advocating for the preventive care philosophy	Strengthening emotional connection and service satisfaction
Price	Value-Driven Subscription Model: Repeat subscription scheme starting at 199–399 RMB/month, instilling habit-forming usage at a predictable, continuous rate.	Accentuating long-term cost-effectiveness, wellness utility, and proactive health preservation value.	Speeding up the frequency of purchases and standardizing customer lifetime value (CLV).
Place	Create a dual O2O track through an APP and Shandong TCM Health and Cultural Tourism Bases.	Integrating with cultural tourism integration and digital transformation policies.	Achieving a convenient O2O service experience
Promotion	Develop the Healthy China “Shandong Youth Wellness Program” brand IP in collaboration with the Shandong Provincial TCM policy initiative.	Enhancing brand communication through immersive, heritage-driven content marketing and strategic storytelling.	Cultivating a stable core consumer group

5.3. Recommendation 3: Innovative Premium Services and Long-Term Loyalty Mechanism Construction for the High Consumption Willingness Group

The group of individuals that is most willing to consume demonstrated the highest scores. Their consumption willingness score was 4.04, with a cognition score of 3.895, and a behavior score of 4.02. This group demonstrates a high level of awareness of all aspects of TCM wellness centers, pursues personalized and premium programs, and possesses strong consumption capacity, with a strong emphasis on quality and service experience. However, they may face concerns regarding efficacy and the issue of insufficient standardization of service supply. To consolidate and expand the consumption potential of this group, an innovation-driven strategy should be implemented. The specific 4P precision marketing strategies are presented in Table 8 below:

Table 8. 4P Precision Marketing Strategy for the High Consumption Willingness Group

4P Element	Targeted Marketing Strategy	Policy & Cultural Integration	Expected Marketing Effect
Product	Develop AI-Driven Constitution Profiling & Custom Therapy packages that combine AI diagnostics with premium offerings from the provincial "Famous Qilu TCM Products" Initiative.	In accordance with the "Smart Medical-Wellness Highland" regional strategic plan and the global healthcare standards.	Satisfying sophisticated, hyper-personalized, and high-end consumer demands
Price	Establish a high-end membership system priced at 1,000–2,000 RMB/year with exclusive VIP services.	Reflecting premium service equity and the high-value utility of professional, customized TCM care.	Erecting a robust, long-term customer loyalty and retention mechanism
Place	Use 5G smart wellness pods and provincial TCM wellness bases to construct a digital O2O premium service network.	Advancing the digital transformation and high-quality upgrading of the medical wellness industry.	Enhancing the technological appeal, prestige, and seamless accessibility of services
Promotion	Conduct KOL brand communication and big-data precision marketing; run seminars and salons on "Bian Que Heritage & Modern Bio-Tech Innovation."	Promoting Qilu cultural heritage and elevating brand positioning via intellectual and cultural leadership.	Positioning the brand image of elite youth as "TCM Wellness Pioneers."

6. Conclusion

This study addresses the strategic imperative for the youth-oriented transformation of the Traditional Chinese Medicine wellness industry under the auspices of the "Healthy China" national initiative. Focusing on young consumers aged 18–34 in Shandong Province, this research integrates exploratory qualitative interviews with a quantitative questionnaire survey, employing K-means clustering to systematically map the intrinsic nomological network linking cognitive characteristics, behavioral patterns, and consumption willingness toward TCM wellness centers. Based on an effective sample of 388 valid respondents, the target market was systematically segmented into three heterogeneous cohorts characterized by low, medium, and high consumption willingness, and corresponding differentiated user profiles were successfully constructed. By doing so, this research not only bridges a critical gap in the literature on young adults' TCM wellness consumption behavior from a regional and segmented perspective but also offers an operational, empirically grounded theoretical framework for precision marketing and service innovation in TCM wellness centers.

Admittedly, several limitations of this study warrant cautious interpretation and point to future research trajectories. First, in terms of geographical boundary conditions, the sample was predominantly drawn from Shandong Province; although regionally representative, the generalizability of these empirical insights to a nationwide scale remains limited, and the universality of the conclusions requires further cross-regional comparative validation. Future studies should integrate multi-province empirical data to map the heterogeneous evolutionary pathways of youth wellness behavior across diverse socio-economic regions. Second, in terms of methodological design, this study relies heavily on cross-sectional survey data, which inherently constrains our capacity to capture the dynamic, temporal evolution of consumer decision-making. To rectify this limitation, future inquiries should adopt longitudinal tracking panel designs, quasi-experimental frameworks, or randomized controlled trials (RCTs). Such methodological advancements will dynamically monitor shifts in consumer habits and empirically test the intervention effectiveness of the strategies proposed herein. Ultimately, these academic efforts will provide empirically grounded, replicable optimization pathways for

the youth-oriented transformation of TCM wellness center services while offering forward-looking insights for the industry to capture emerging marketing opportunities.

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