

## Preliminary Study on Mobile App for Traditional Chinese Medicine Education Among Chinese Senior Citizens

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### ABSTRACT

Traditional Chinese medicine (TCM) is widely trusted by older adults, yet many face difficulties in acquiring systematic TCM knowledge due to limited digital literacy and a lack of age-appropriate mobile learning platforms. This study aims to investigate the feasibility and effectiveness of mobile learning platforms in enhancing Chinese senior citizens' knowledge of TCM and health behaviours, alongside examining learning motivation and barriers to technology use. A mixed-methods approach was adopted, involving a questionnaire survey of 50 participants aged 50–75 years, supplemented by descriptive statistical and thematic analyses. The results indicate that although most participants expressed strong interest in TCM, their overall knowledge level and health awareness were relatively low. Content quality and ease of operation emerged as the most influential factors affecting acceptance of mobile learning platforms. Notably, over 60% of respondents reported a willingness to learn TCM through a dedicated mobile application and perceived improvements in their health behaviours after learning. This study provides empirical evidence supporting the development of an age-friendly mobile learning platform for TCM education. Such platforms have the potential to enhance health knowledge and encourage positive health behaviours among older adults.

**Contribution/Originality:** This study is one of very few studies which have investigated Chinese senior citizens' acquisition of TCM knowledge through mobile learning applications. By adopting a mixed-methods approach, it documents seniors' TCM knowledge levels, health awareness, learning motivations, and usage barriers, providing empirical evidence for age-friendly, culturally specific digital health education design.

## 1. Introduction

With declining fertility rates and increasing life expectancy, population aging has become a global trend, and China is no exception (Cui et al., 2024). According to the China National Bureau of Statistics, the number of adults aged 60 and above will exceed 300 million by 2030, representing nearly one-third of the national population. This demographic shift has intensified multiple social challenges, including labor shortages, rising pressure on social security and healthcare systems, and increasing demand for elderly education and training (Emmesjö et al., 2025; Melchior, 2023). Therefore, safeguarding the physical and psychological needs of the elderly has become one of the key elements in alleviating the challenges of population aging (Cui et al., 2024).

Traditional Chinese Medicine (TCM), rooted in thousands of years of Chinese history, remains widely used for disease treatment and health maintenance (Singh, 2024). For many Chinese seniors, TCM practice, which encompasses medicinal diets, herbal remedies, therapeutic exercises, and various health-preserving techniques, functions both as a healing method and as a lifestyle (McGee, 2024). Despite its cultural relevance, systematic learning pathways for seniors are limited. Most rely on fragmented sources such as newspapers, WeChat articles, and TikTok videos, which often lack authority and coherence, making it difficult to build an integrated understanding of TCM (Ma et al., 2025; Wang, 2023; Xia & Xia, 2024).

With the rapid advancement of information technology, educational media have undergone continuous updates and iterations. From mobile learning to the development of various apps, these innovations have not only broken through geographical and temporal constraints but also created more convenient conditions for learners of all ages, opening new possibilities in the field of education (Nikpeyma et al., 2024; Salhab & Daher, 2023). Salhab & Daher (2023) found that the flexibility and convenience of mobile learning significantly enhance the learning experience. Research indicates that learning through apps can transform abstract and complex TCM knowledge into interactive, multisensory learning experiences, making the learning process more comprehensible and immersive (Ghozali, 2024; Nikpeyma et al., 2024; So et al., 2019). Health apps are increasingly designed to facilitate a broad range of health interventions, such as public health education, disease prevention, diagnosis, and management (Fendt et al., 2021).

Although existing research has examined older adults' experiences with mobile applications, previous studies have primarily focused on health management (Jayathilake et al., 2024; McCarthy et al., 2024) and health treatment (Cheng et al., 2022; Kashyap & Sharma, 2023). Concurrently, TCM apps have made strides in recent years in areas such as constitution analysis and chronic disease rehabilitation (Ge et al., 2022; Xia et al., 2023). However, current research on older adults and digital health predominantly centers on intervention studies examining apps' impact on health. Empirical research linking mobile learning apps to Chinese senior citizens' TCM health knowledge, health awareness, and health-related behavioral changes remains limited. This study aims to systematically present the current landscape of Chinese senior citizens using mobile applications to learn TCM knowledge, delineate their TCM-related behavioral patterns and health awareness levels, and identify key factors influencing their sustained engagement in lifelong learning within the TCM domain.

## **2. Literature Review**

### **2.2. Mobile Apps Learning and Seniors**

In recent years, mobile learning has increasingly become a vital tool for enhancing health literacy among older adults. Mohtar et al. (2023) noted in a systematic review that mobile learning methods integrating videos, animations, and interactive feedback significantly boost middle-aged and older adults' interest and engagement in learning health knowledge, with particularly pronounced effects when content aligns with real-life experiences. A mixed-methods study by Zhao et al. (2021) among older adult students in Chinese universities demonstrated that mobile social media holds distinct advantages in promoting self-directed learning among older adults. Variables such as perceived usefulness and ease of use significantly influenced adoption rates, validating the applicability of the Technology Acceptance Model. Additionally, Liu et al. (2021) conducted a systematic review examining the interfaces and persuasive features of mobile health apps for older adults. They found that apps featuring high contrast, large fonts, intuitive navigation, and behavioral incentives (such as goal-setting and feedback) were more readily accepted and sustained by older users. They also emphasized the necessity of tailoring digital learning experiences to the physiological, psychological, and cultural characteristics of the elderly population. Thus, these studies lay the research foundation for integrating mobile learning platforms into TCM app learning among Chinese senior citizens.

### **2.3. TCM and Digital Health Education**

Traditional Chinese Medicine (TCM) is a medical system with a history spanning thousands of years, emphasizing harmony between body and mind and advocating a health philosophy centered on prevention (Marshall, 2020). Compared to modern Western medicine, which primarily focuses on disease treatment, TCM places greater emphasis on regulating the dynamic balance among physiological, psychological, and environmental factors. Its core theories encompass the Yin-Yang doctrine and the circulation of Qi and blood through meridians (Zhao et al., 2021). Common TCM health interventions, including herbal medicine, acupuncture, dietary therapy, massage, and qigong, play a significant role in chronic disease management and health promotion among older adults (Zhao et al., 2021).

In recent years, TCM has garnered significant attention for its efficacy in enhancing the physical and mental health of older adults. For instance, Liu et al. (2020) demonstrated the safety and effectiveness of Baduanjin for frail elderly individuals; Wan et al. (2022) confirmed through a randomized controlled trial that Tai Chi can alleviate chronic low back pain and improve quality of life. While these studies confirm the positive impact of TCM exercises, most research focuses on short-term efficacy with limited attention to the digital dissemination of TCM education. With advances in information technology, the integration of TCM with digital tools has emerged as a research hotspot. Duan et al. (2021) reviewed the application of TCM in smart healthcare, emphasizing the role of digital technology in advancing the modernization of TCM. While existing studies have applied mobile learning and blended teaching to TCM education, most subjects were medical students or practitioners. Research on Chinese citizen seniors as independent learners acquiring TCM knowledge through digital platforms remains notably underdeveloped, presenting a research gap worthy of further exploration.

## 2.1. Theoretical Framework

In the field of apps education explored in this study, the study adopts Adult Learning Theory (ALT) and the Technology Acceptance Model (TAM) as complementary theoretical frameworks to investigate how mobile learning apps can support TCM education for Chinese senior citizens. These two theoretical models facilitate a deeper understanding of how mobile apps' learning features influence user acceptance, learning motivation, and engagement, particularly in health education contexts rooted in cultural traditions.

First proposed by Knowles in 1980, ALT posits that adult learners typically exhibit self-directed tendencies, with learning behaviors influenced by accumulated life experiences and motivations often stemming from explicit personal goals (Niksadat et al., 2022; Ozuah, 2016). Therefore, learning outcomes are often optimal when adult learners engage with content closely tied to real-life contexts and practical needs (Darden, 2014; Merriam, 2001). In health education, the ALT is frequently applied to analyze older adults' learning behaviors, particularly their performance in digital and mobile apps learning environments. Empirical research indicates that educational content aligned with learners' prior experiences and current concerns effectively enhances their engagement and knowledge retention. For instance, Niksadat et al. (2022) found that older adults achieved more significant learning outcomes when materials were connected to their daily lives. Zhao et al. (2024) similarly emphasized that learning autonomy and digital literacy are crucial for promoting lifelong learning among older adults via digital platforms.

TAM has been widely applied to study the acceptance and adaptation processes of digital technologies among older adults. For instance, Askari et al. (2020) found in their study of community-dwelling older adults that factors such as perceived usefulness, perceived ease of use, and attitudes toward technology directly influence their willingness to use mobile health apps. This finding indicates that older adults are more inclined to try a technology when they perceive it as both practical and easy to operate. Further research by Zhao et al. (2021) on older adults' use of mobile social media validated similar patterns, reaffirming that ease of use and personal cognition remain core factors influencing digital technology adoption among this demographic. Building upon this, Li et al. (2024) proposed a specialized model for smart health services in retirement communities based on TAM, noting that demographic factors such as age, gender, education level, and income also significantly influence user attitudes. Collectively, these studies demonstrate that TAM not only aids in understanding user adoption intentions but also provides guidance for designing digital health tools.

Existing research predominantly focuses on generic health or communication apps, with limited attention given to culturally specific tools like TCM learning platforms. This study situates TAM within a specific cultural context to explore Chinese senior citizens' responses to mobile learning apps for TCM content, emphasizing the combined impact of perceived functionality, cultural familiarity, and digital literacy on senior citizens' learning engagement.

## 3. Research Methods

This study uses a mixed-methods approach, focusing on quantitative descriptive research and combining it with a small amount of qualitative data analysis to enhance the depth and reliability of data interpretation. This approach was selected to provide both a broad

overview of Chinese senior citizens' TCM knowledge and behaviors and an in-depth understanding of their learning experiences and Digital technology barriers (Malina et al., 2011). A descriptive research design is suitable for systematically depicting the knowledge level, behavioural patterns and attitudes of a specific population, which can help to reveal user needs and the current situation, and provide a theoretical basis for subsequent intervention and application development (Bloomfield & Fisher, 2019).

### **3.1. Research Location and Study Population**

The study was conducted in Zhengzhou, a major urban center in central China. Zhengzhou was selected as the research location due to its rapidly ageing population and widespread smartphone use among older adults, making it an appropriate context for examining the adoption of mobile learning for health education.

The study population consisted of Chinese senior citizens aged between 50 and 75 years residing in urban communities. The age range was set with reference to the criteria defined by most scholars in geriatric education and health research (Mahmud et al., 2022), and also combined with China's national retirement policy and the age requirements for enrolment in senior universities around the world, which were reasonable and representative. The inclusion criteria for the participants included (1) Chinese citizen seniors, (2) being in or near retirement, (3) having basic experience with digital devices (for example, smartphones, tablets) and being able to operate mobile apps independently or with assistance.

### **3.2. Sampling Method and Sample Size**

This study employed a convenience sampling approach, combined with purposeful inclusion criteria, to recruit 50 voluntary participants from the community. Given the exploratory nature of this research, which does not seek to establish causality—and the fact that participants were Chinese senior citizens possessing basic digital literacy, this methodology was deemed appropriate. Qualitative data were derived from open-ended questions embedded within the questionnaire. All 50 Chinese senior citizens were invited to provide qualitative responses; no separate qualitative sampling was conducted.

### **3.3. Research Instrument**

This study employed a questionnaire survey as its primary research tool, covering five key dimensions: (1) demographic background; (2) current level of knowledge about TCM; (3) TCM-related health behaviors; (4) health cognition; (5) willingness and barriers to using mobile apps for learning. Questionnaire items were developed by the authors based on an extensive review of previous studies on mobile learning, health behavior, and TCM education, and were adapted to suit the cognitive and linguistic characteristics of Chinese senior citizens (Liu et al., 2021; Mohtar et al., 2023; Zhao et al., 2021). To ensure the questionnaire's validity, the draft underwent multiple rounds of review and revision by two education experts. A pre-test was subsequently conducted with five elderly users, focusing on assessing the questionnaire's clarity and usability. The pre-test results indicated minor issues related to item wording and question clarity. Based on feedback, the questionnaire was optimized to enhance its accuracy and practicality. Additionally, the wording and structure of items were further adjusted to align with the cognitive and linguistic habits of Chinese senior citizens, ensuring the questionnaire was accessible and easy to understand.

### 3.4. Data Collection Procedure

This survey was conducted from August to September 2024 through both online (WeChat groups, community platforms) and offline (community centers, parks) channels. Research assistants assisted Chinese senior citizens with lower digital literacy in completing the questionnaire to ensure data integrity. To uphold ethical standards, the survey was conducted anonymously, with data used solely for academic research, safeguarding Chinese senior citizens' privacy and voluntary participation. To ensure representativeness and minimize sampling bias, the researcher actively recruited Chinese senior citizens from urban communities with diverse socioeconomic backgrounds.

### 3.5. Data Analysis

This study used a mixed-methods approach to analyse the collected data. The quantitative data were processed using SPSS 26.0, and mainly descriptive statistics, including frequency, percentage, and cross-tabulation analyses, were used to reveal the distributional characteristics and trend patterns of the middle-aged and Chinese senior citizens in terms of their TCM knowledge level, health behavioural involvement, and learning preferences. For the open-ended questions in the questionnaire, NVivo qualitative analysis software was used for coding and thematic summarisation. Through systematic identification of keywords, repetitive ideas and conceptual categorisation, respondents' actual experiences, barriers to use and functional expectations of m-learning platforms were deeply explored. Qualitative data analysis not only enriched the quantitative results but also provided a critical addition to explaining the underlying needs and attitudes of Chinese senior citizens in digital health education.

## 4. Results

To better understand the background of this study, the first section outlines the demographic and health characteristics of the Chinese senior citizens, as well as their experience with mobile apps. A total of 50 Chinese senior citizens aged 50 to 75 participated in the survey. The age distribution was relatively even, with 32% aged 50–55, 30% each in the 56–60 and 61–65 age groups, and a smaller proportion aged 66 and above. Gender distribution was balanced, with 44% male and 56% female. Regarding health status, many Chinese senior citizens reported multiple chronic conditions; 12% of Chinese senior citizens reported no chronic diseases. Regarding digital experience, Chinese senior citizens' familiarity with mobile apps varied significantly. 42% of respondents had used apps for over five years. Educational backgrounds were diverse; 16% had primary school education or below, 20% completed secondary education, half received college or vocational training, and 14% held a college degree or higher (See Table1).

Table 1 Findings on knowledge of TCM among Chinese senior citizens

| Variables | Number | %  | Variables        | Number | %  |
|-----------|--------|----|------------------|--------|----|
| Age       |        |    | Gender           |        |    |
| 50-55     | 16     | 32 | Male             | 22     | 44 |
| 56-60     | 15     | 30 | Female           | 28     | 56 |
| 61-65     | 15     | 30 | APP experience   |        |    |
| 66-70     | 1      | 2  | Less than 1 year | 11     | 22 |
| 71-75     | 3      | 6  | 1-2 years        | 10     | 20 |

|                   |    |    |                   |    |    |
|-------------------|----|----|-------------------|----|----|
| Chronic disease   |    |    | 2-4 years         | 8  | 16 |
| Hypertensive      | 18 | 36 | Over 5 years      | 21 | 42 |
| Hyperglycaemia    | 7  | 14 | Educational level |    |    |
| Hyperlipidaemia   | 6  | 12 | Primary or below  | 8  | 16 |
| Digestive Disease | 7  | 14 | Secondary         | 10 | 20 |
| Arthritis         | 8  | 16 | Post-secondary    | 25 | 50 |
| Others            | 18 | 36 | Degree or above   | 7  | 14 |
| No                | 6  | 12 |                   |    |    |

Beyond basic demographic data, the study also examined Chinese senior citizens' overall attitudes and willingness toward learning TCM. Results revealed strong interest among Chinese senior citizens, with 54% expressing interest, 26% showing high interest, 18% remaining neutral, and only 2% expressing disinterest. Additionally, 60% were willing to learn TCM through dedicated apps, 36% were uncertain, and only 4% were unwilling. The open attitude of Chinese senior citizens toward learning TCM via apps indicates that, despite variations in educational attainment or digital experience, they maintain a strong desire to acquire TCM and health knowledge and are willing to explore app-based learning. This underscores the necessity of designing targeted interventions for Chinese senior citizens. Such interventions should not only utilize apps as learning platforms but also leverage them as tools for preventive health education and behavioral change.

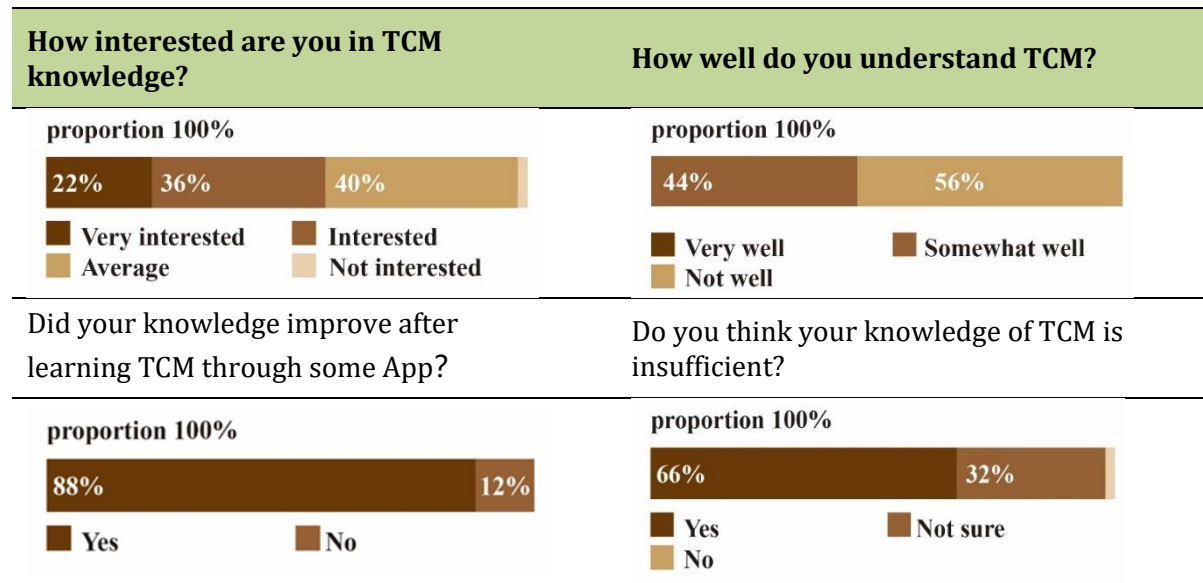
Beyond assessing Chinese senior citizens' overall attitudes toward TCM, this study further examines four interrelated dimensions: TCM knowledge levels, frequency and types of TCM health behaviors, health awareness and understanding of TCM principles, as well as motivations and barriers influencing lifelong learning via digital platforms. Through a comprehensive analysis of these dimensions, this study aims to gain deeper insights into how Chinese senior citizens' TCM knowledge reserves, behavioral patterns, health literacy, and learning willingness interact within the context of digital TCM education.

#### 4.1. Knowledge Of TCM Among Chinese Senior Citizens

Regarding the current state of TCM knowledge among Chinese senior citizens, 22% expressed strong interest in TCM, 36% showed interest, 40% held a neutral stance, and only 2% reported no interest whatsoever. However, despite this strong interest, their understanding and mastery of TCM knowledge remains limited. Fifty-six percent self-assessed their understanding as limited, 44% considered it adequate, and none claimed thorough mastery. After learning TCM through certain apps, 66% of respondents felt their knowledge had improved, 32% were uncertain, and only 2% reported no benefit.

Furthermore, 88% of respondents felt their overall TCM knowledge was insufficient, while only 12% considered their knowledge base adequate. These findings reveal that while seniors demonstrate strong interest, their existing TCM knowledge reserves are inadequate. Although their mastery of TCM knowledge is insufficient, learning through apps does enhance TCM knowledge. This underscores the importance of utilizing mobile platforms to provide convenient, systematic TCM education (See Table 2).

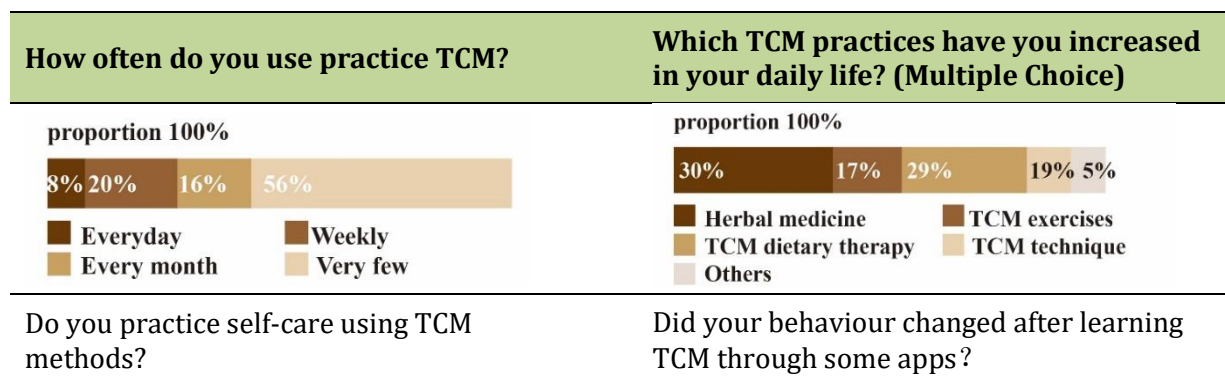
Table 2: Findings on knowledge of TCM among Chinese senior citizens



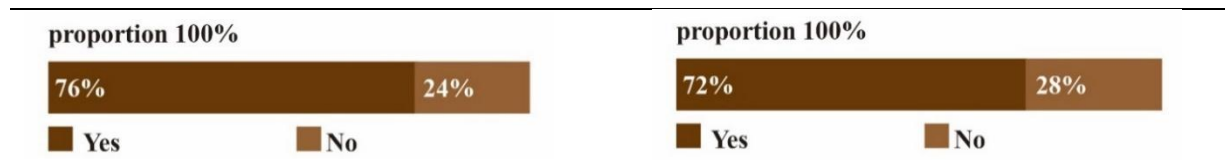
#### 4.2. TCM Health Behaviours Among Chinese Senior Citizens

For the current status of Chinese senior citizens' TCM health behaviours, this study found that 76% of Chinese senior citizens used TCM methods for self-care. Among them, 30% increased the use of herbal medicine, 29% dietary therapy, 19% TCM exercises, and 5% TCM techniques; 17% also indicated other practices. In terms of frequency of use, 56% reported using TCM methods only occasionally, 16% every month, 20% weekly, and only 8% daily. The adoption rate of herbal medicine and dietary therapy was relatively high, but consistent daily use was limited. The use of TCM techniques and exercises was comparatively lower and mostly infrequent. It is worth noting that 72% of Chinese senior citizens reported positive behavioural changes after learning TCM through mobile apps, while 28% did not notice a change. This finding highlights the behavioral plasticity of older adults when provided with accessible digital health interventions (See Table 3). The integration of mobile learning into TCM promotion could serve as a catalyst for sustained engagement and healthier lifestyle practices among the aging population. TCM practices are familiar to many Chinese seniors, digital tools may help reinforce frequency and consistency of use over time.

Table 3: Findings on healthy behaviour among Chinese senior citizens



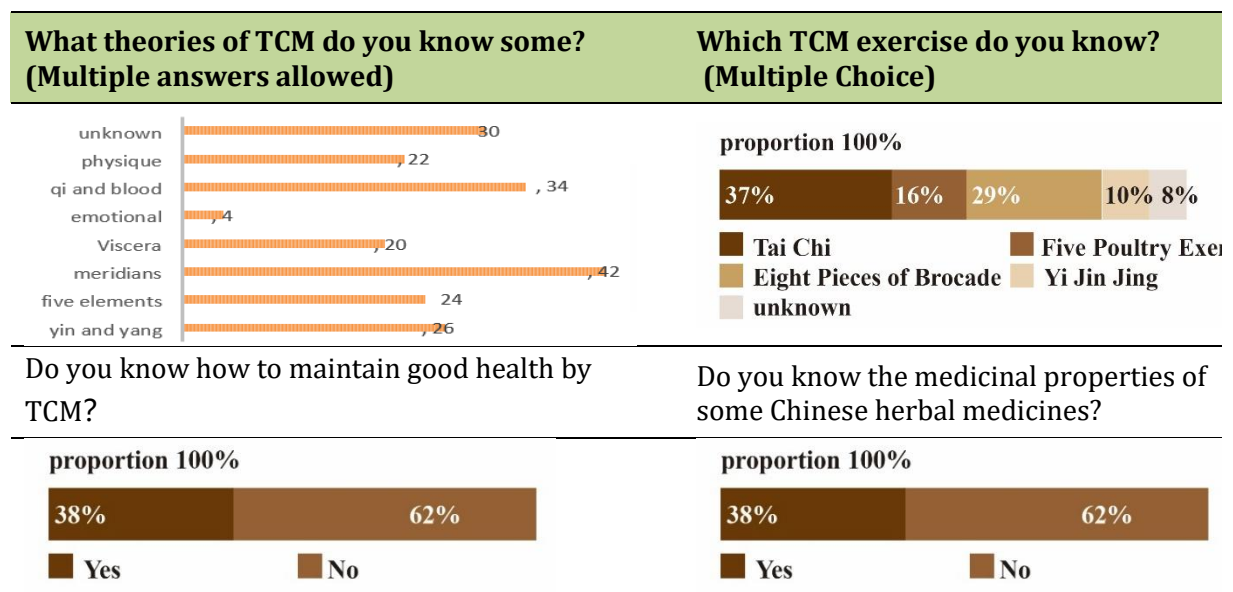




### 4.3. TCM Health Awareness Among Chinese Senior Citizens

For health awareness of TCM, in this study, the health awareness of TCM among Chinese senior citizens was initially measured by a number of indicators. The results showed that in terms of TCM theory awareness, the meridians theory had the highest recognition rate (42%), followed by qi and blood (34%), yin and yang (26%), five elements (24%), physique (22%), and viscera (20%), while only 4% mentioned emotional theory. Still, 30% were uncertain about any theory. In terms of TCM exercises, Tai Chi had the highest awareness (37%), followed by Eight Pieces of Brocade (29%), unknown (16%), Five Poultry Exercise (10%), and Yi Jin Jing (8%). This reflects a moderate but uneven familiarity with traditional practices. At the level of health maintenance knowledge, 74% of Chinese senior citizens said they understood how to maintain health through TCM methods, while 26% did not. Additionally, only 38% of Chinese senior citizens understand the medicinal value of TCM, while 62% remain completely unaware of it. Overall, there exists a significant disparity in the Chinese elderly population's understanding of TCM healthcare. Although older Chinese individuals possess a moderate level of comprehension regarding TCM's core theories and practices, their awareness of TCM wellness concepts and medicinal value remains notably weak. There is an urgent need to enhance TCM healthcare awareness through systematic health education. This indicates that although Chinese senior citizens have been exposed to TCM culture, they lack a deep understanding of its concepts and practical applications. Promoting accessible and engaging educational content through digital platforms may bridge this knowledge gap, particularly for Chinese senior citizens who already possess moderate smartphone proficiency (See Table 4).

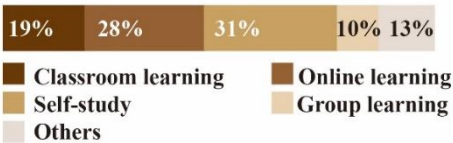
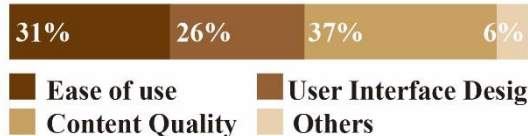
Table 4: Findings on healthy awareness among Chinese senior citizens



#### 4.4. Motivations affecting lifelong learning Among Chinese Senior Citizens

For motivations affecting lifelong learning among Chinese senior citizens, Survey results show that 74% of Chinese senior citizens are currently participating in elderly education or learning activities, indicating a relatively high level of engagement in lifelong learning. Regarding preferences for learning modes, self-study (28%) and online learning (31%) were the most preferred, reflecting a strong inclination toward flexible and personalised learning approaches. This was followed by classroom learning (19%), group learning (10%), and other modes (13%), indicating a diversity of learning preferences among the elderly population. As for the factors influencing the acceptance of learning apps, content quality (37%) and ease of use (31%) were considered most important, followed by user interface design (26%) and other reasons (6%). The qualitative findings revealed several key themes regarding older adults' acceptance of mobile learning platforms. One prominent theme concerned interface usability barriers, which appeared most frequently in the qualitative data, with 21 coded references describing issues such as small font sizes and overly complex interaction processes. Another recurring theme related to operational complexity and ease-of-use challenges, identified in 12 coded references, including complicated navigation structures, excessive operational steps, and difficulties in adjusting application settings. A further theme focused on content quality and relevance, represented by 10 coded references, reflecting perceptions that the learning content was difficult to understand, lacked systematic explanations, or was insufficiently connected to daily health practices. In addition, an overarching theme of external and contextual barriers emerged with five coded references, encompassing concerns such as frequent advertisements, distracting pop-up notifications, privacy issues, and limited time availability. These findings suggest that older adults' participation in lifelong learning in China is influenced not only by intrinsic motivation and preferred learning modes but also constrained by external factors such as technological accessibility, health conditions, and time availability (See Table 5).

Table 5: Findings on lifelong learning among Chinese senior citizens

| Are you currently participating in any elderly education or learning activities?                                                                                                                     | How would you prefer to participate in lifelong learning? (Multiple Choice)                                                                                                                                                                 |               |   |             |    |                 |    |                       |    |        |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---|-------------|----|-----------------|----|-----------------------|----|--------|---|
| <p>proportion 100%</p>  <p>74% 26%</p> <p>Yes No</p>                                                              | <p>proportion 100%</p>  <p>19% 28% 31% 10% 13%</p> <p>Classroom learning Online learning<br/>Self-study Group learning<br/>Others</p>                   |               |   |             |    |                 |    |                       |    |        |   |
| What are the acceptance factors that influence your use of apps? (Multiple answers allowed)                                                                                                          | Why do these factors affect your acceptance of the app?                                                                                                                                                                                     |               |   |             |    |                 |    |                       |    |        |   |
| <p>proportion 100%</p>  <p>31% 26% 37% 6%</p> <p>Ease of use User Interface Design<br/>Content Quality Others</p> | <table> <tr> <td>Main category</td><td>N</td></tr> <tr> <td>Ease of use</td><td>12</td></tr> <tr> <td>Content quality</td><td>10</td></tr> <tr> <td>User interface design</td><td>21</td></tr> <tr> <td>Others</td><td>5</td></tr> </table> | Main category | N | Ease of use | 12 | Content quality | 10 | User interface design | 21 | Others | 5 |
| Main category                                                                                                                                                                                        | N                                                                                                                                                                                                                                           |               |   |             |    |                 |    |                       |    |        |   |
| Ease of use                                                                                                                                                                                          | 12                                                                                                                                                                                                                                          |               |   |             |    |                 |    |                       |    |        |   |
| Content quality                                                                                                                                                                                      | 10                                                                                                                                                                                                                                          |               |   |             |    |                 |    |                       |    |        |   |
| User interface design                                                                                                                                                                                | 21                                                                                                                                                                                                                                          |               |   |             |    |                 |    |                       |    |        |   |
| Others                                                                                                                                                                                               | 5                                                                                                                                                                                                                                           |               |   |             |    |                 |    |                       |    |        |   |

In summary, Chinese senior citizens demonstrate a strong interest in TCM knowledge and express a clear willingness to acquire it through learning channels such as mobile apps. However, significant gaps remain in their understanding of key areas, particularly TCM

theory and the properties of Chinese herbal medicines. Additionally, the frequency and consistency of their daily TCM wellness practices are relatively low. While mobile-assisted TCM learning holds great promise, it requires ongoing improvements in design and content relevance. This includes incorporating age-friendly design, simplifying app user interfaces and interactions, and making learning content more relatable to daily life, ensuring it is easy to understand and learn. Such enhancements will bridge the gap between interest and practical learning, elevate health literacy among Chinese senior citizens, and advance the process of active aging.

## 5. Conclusion

This study analyzed the current status of Chinese senior citizens using apps learning platforms to acquire health knowledge through questionnaire surveys, and explored the potential and limitations of mobile learning technology in promoting health education and lifelong learning. Using TCM content as a cultural context, it also revealed the application value of apps educational technology in real-world social settings. Findings indicate that mobile apps learning platforms not only effectively enhance Chinese senior citizens' interest and engagement in health knowledge acquisition but also contribute to positive shifts in their health awareness and behaviors to some extent. However, the study also uncovers Chinese senior citizens generally demonstrate a strong interest in health knowledge but lack systematic understanding and behavioral change. This finding resonates with the conclusions of Sun et al. (2020), underscoring the importance of structured, contextualized educational content design and highlighting the disconnect between interest and learning outcomes in health education for Chinese senior citizens.

Apps technology plays a crucial role in assisting Chinese senior citizens in learning TCM. Apps designs incorporating videos, voice narrations, animated examples, and interactive quizzes not only alleviate comprehension barriers caused by cognitive decline among this demographic but also enhance their learning motivation and sense of self-efficacy. Alsswey et al. (2018) noted that digital learning environments significantly boost sustained learner engagement through interactive feedback and personalized content. However, research also reveals that Chinese senior citizens encounter numerous barriers when using mobile apps, such as complex interfaces, operational difficulties, and poor text legibility. This aligns with the mechanism in TAM where perceived ease of use influences user intent (Mahmud et al., 2022; Smith, 2021). Therefore, educational technology designed for Chinese senior citizens should prioritize accessibility and user-friendliness to ensure apps features genuinely support learning rather than adding to the learning burden.

Additionally, ALT emphasizes the autonomy and experience-driven characteristics of adult learners, while TAM elucidates the psychological mechanisms underlying technology adoption. The integration of these two frameworks provides a comprehensive lens for understanding how Chinese senior citizens develop learning motivation, technological trust, and sustained usage intentions within apps learning environments. This study indicates that Chinese senior citizens prefer learning content integrated with their life experiences and health practices, and demonstrate greater acceptance toward app-based learning formats that provide immediate feedback and cultural relevance.

Overall, this chapter reveals the multifaceted value propositions of app-based learning from an educational technology perspective, highlighting its potential to enhance learning engagement, foster health awareness, and achieve digital inclusion for Chinese senior

citizens. The research findings provide empirical support for developing culturally adapted, user-centered educational platforms for older adults, while offering new insights into the interdisciplinary application of educational technology in health education. More importantly, mobile apps learning serves not only as a technical tool for information dissemination but also as a critical educational strategy for promoting learning equity and advancing China's "smart aging" societal development. Future educational design should leverage emerging technologies such as artificial intelligence (AI), learning analytics, and human-computer interaction to continuously optimize the content presentation and interactive experience of multimedia mobile learning. This will transform it into an effective bridge connecting traditional knowledge with modern technology, thereby fostering lifelong learning for all citizens.

### **Ethics Approval and Consent to Participate**

All data were collected and reported with complete transparency to ensure clarity and minimize any ethical concerns. All procedures involving human subjects in this study were conducted on a strictly voluntary basis, with informed consent obtained via questionnaires. All participants provided informed consent in accordance with the Declaration of Helsinki.

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### **Conflict of Interest**

The authors declare no conflict of Interest.

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