

RESEARCH ARTICLE

Integrating Technology into Geriatric Care: Assessment of the Acceptance and Preferences of Older Adults in Hangzhou, China on the 'Internet Plus' Healthcare Model

Yun-Zhao Lin^{1,2,*}, Meng-Meng Lin^{1,2,*}, and Erlinda C. Palaganas, PhD, RN, FAAN^{1,3}

Abstract

Background and Objectives: Hangzhou, a digital leader in China, is pioneering the development of an 'Internet Plus' medical and geriatric services system designed to leverage the city's advanced digital infrastructure, extensive medical resources, and strong government support to address the healthcare needs of its elderly population. Despite the surge in the use of such technology, there remains a gap in the comprehension and perception of such technological solutions and how the said solutions can be effectively integrated into community-based services to meet the elderly's complex healthcare needs. This study, therefore, aimed to explore not only the preferences and acceptability of the 'Internet Plus' model among elderly residents in Hangzhou, but to also identify the key factors that influence the successful integration of such technology into elderly-focused care services.

Methods: The study used quantitative surveys and qualitative data to better understand geriatric requirements. A structured questionnaire was administered to a stratified random sample of 908 elderly residents across various communities in Hangzhou, measuring the utilization and the preferences for different older adults care services. Purposive sampling was also done on 15 participants who underwent in-depth interviews. Quantitative data was statistically analyzed using SPSS 26.0 while qualitative data was processed using Atlas.ti, a qualitative data analysis software.

Results: The analysis of survey responses from 908 elderly residents in Hangzhou, combined with qualitative interviews, provided a comprehensive view of the preferences and needs regarding the "Internet Plus" elderly care system. Majority of respondents at 91.3% favored technology-assisted home care, emphasizing the convenience and comfort it offers. The "Internet Plus" model for medical services was preferred by 96.4%, suggesting a strong inclination towards technology-enabled healthcare access. Comprehensive health maintenance was considered important by 94.4% of participants thereby highlighting the need for ongoing health support. The qualitative analysis corroborated these findings, with elderly participants expressing a strong desire for home-based medical services and the importance of reliable emergency medical assistance.

Conclusion: The study affirmed a pronounced preference for technology-assisted healthcare among Hangzhou's elderly, underscoring a critical shift towards patient-centric models. To optimize elderly care, it was also discovered how imperative it was to expand home care technologies, to fortify the 'Internet Plus' healthcare framework, and to augment community health centers for holistic care. Integrating swift emergency response systems was also found out to be essential in order to ensure that the 'Internet Plus' model not only meets but exceeds the evolving healthcare demands of the aging population.

Keywords: *Internet Plus, older adult Care, community services, technology integration, health maintenance*

Introduction

In the contemporary era marked by a globally aging population, the healthcare sector is experiencing a transformative impact due to the rapid integration of technology. This is particularly evident in the domain of older adult care, where the advent of

digital solutions is redefining service delivery models. Hangzhou, a city at the epicenter of China's digital revolution, is pioneering the 'Internet Plus' healthcare model, an innovative approach that amalgamates traditional healthcare with

¹ Saint Louis University, Baguio City, Philippines

² Corresponding author's email address: Yun-Zhao Lin, E-mail: linyz@hzcw.edu.cn; Meng-Meng Lin, E-mail: 1037749063@qq.com/linmm@hzcw.edu.cn; Hangzhou City University, Hangzhou City, China

³ Professorial Lecturer, College of Nursing, University of the Philippines, Manila, Philippines

* Yun-Zhao Lin, Meng-Meng Lin contributed equally to this work and share first authorship.

advanced digital technologies. This model is designed to harness the city's sophisticated digital infrastructure, extensive medical resources, and robust governmental backing to cater to the healthcare needs of its burgeoning aging population.

Existing research highlights the transformative potential of Internet technologies in older adult care. Studies emphasize the role of "Internet Plus" models in enabling remote health monitoring and personalized care within smart communities (Bryant et al., 2017). Integrating online and offline services through O2O (Online-to-Offline) approaches has also shown promise in delivering seamless care (Latini, 2019). Additionally, utilizing IoT devices for health monitoring, emergency response, and overall quality-of-life improvements has been widely explored (Padikkapparambil et al., 2020). These studies consistently underscore the importance of user-centered design to address privacy concerns and facilitate technology adoption, ultimately contributing to the development of sustainable and efficient medical and geriatric services.

Despite the promising developments, a significant gap exists in the literature regarding the comprehensive understanding of how older adults perceive and accept these technological advancements within the context of their healthcare services. There is a paucity of research that delves into the acceptance and preferences of the 'Internet Plus' model among the older adults, especially within community-based settings. This gap is critical as it pertains to the successful integration of technology into elderly care services, which is essential for developing a healthcare model that is both effective and widely accessible.

Generally, this study aimed to explore the preferences and acceptability of the 'Internet Plus' model among older adults in Hangzhou, China and identify the key factors that influence the successful integration of technology into geriatric services. The significance of this research lies in its potential to inform the development of a patient-centric healthcare model that is not

only technologically advanced but also deeply responsive to the needs and preferences of the older adults. The innovative aspect of this study is its focus on older persons' perspective, which is often underrepresented in technology adoption studies.

Methodology

Research Design

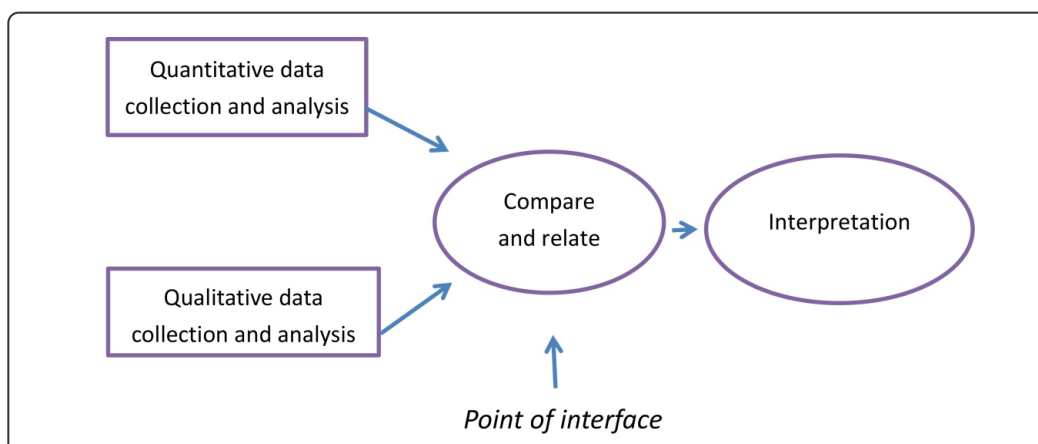
The study used a convergent parallel mixed-methods approach to explore Hangzhou's 'Internet Plus medical and geriatric services system,' combining quantitative surveys with qualitative interviews. This convergent parallel design allowed for a comprehensive analysis that captures the breadth and depth of the older adults' needs and preferences regarding community-based health and caregiving services.

The above framework of the convergent parallel mixed-method approach adopted from Creswell (2018), was conducted in this study. The quantitative survey was carefully designed to cover a range of topics related to the older adults' healthcare needs, preferences for 'Internet Plus' services, and their satisfaction with existing services. Interview Protocol: The qualitative interviews were guided by a semi-structured interview outline, which allowed for flexibility in probing deeper into participants' responses and experiences. The point of interface was during the data integration: Both quantitative and qualitative data were compared and related as the data were integrated leading to the interpretation stage, ensuring that the findings from both methods were considered together to provide a comprehensive understanding of the study's subject matter.

Quantitative Phase

The study, conducted from January 2023 to June 2024, utilized stratified random sampling to select a cohort of 908 older adults

Figure 1. Convergent Parallel mixed-method approach (Creswell, 2018)



from four communities across Hangzhou City, China. This comprehensive observation period allowed for capturing longitudinal data, providing insights into the dynamics of their care needs.

Inclusion and Exclusion Criteria

The study included individuals aged 60 years or older who were permanent residents of selected communities within Hangzhou's ten administrative districts. The respondents were required to possess adequate cognitive function to provide informed consent and actively participate in both qualitative interviews and quantitative surveys. Additionally, the respondents needed access to or a willingness to learn basic digital technology relevant to "Internet Plus" services. Older persons who are bedridden, confined in their own homes or are hospitalized were excluded in this study.

Profile of the Respondents

Table 1 shows the profile of the older adults surveyed in Hangzhou. The table is segmented by age groups, showing that most respondents fall within the 60-69 age bracket, constituting 42.51% of the total surveyed population. Regarding marital status, 72.03% are married, while 25.55% are widowed. The educational level varies significantly, with 15.31% being illiterate or semi-literate and 11.12% having a college education or higher. Regarding pre-retirement occupations, most were employed in state or collective enterprises (60.46%), followed by agricultural workers (14.43%).

Qualitative Research

A purposive sample of 15 participants was selected for qualitative interviews, including older adults, family members,

Table 1. Profile of the Respondents

Category	N=908	Percentage (%)
Age		
60-69 years	386	42.51
70-79 years	310	34.14
80 years and above	212	23.35
Marital Status		
Married	654	72.03
Widowed	232	25.55
Unmarried/Divorced	22	2.42
Educational Level		
Illiterate/Semi-literate	139	15.31
Primary School	138	15.20
Junior High School	284	31.28
High School	171	18.83
Vocational School	75	8.26
College and above	101	11.12
Pre-retirement Occupation		
Government/Institutional Personnel	88	9.69
State/Collective Enterprise Personnel	549	60.46
Private Enterprise Personnel	91	10.02
Self-Employed Business Owners	12	1.32
Agricultural Workers	131	14.43
Unemployed	24	2.64
Other Occupations	13	1.43

Table 2. Characteristics of Participants

Code	Gender	Age	Marital Status	Educational Level
Older Adult 01	Male	63	Married	Illiterate/Semi-literate
Older Adult 02	Female	65	Widowed	Junior High School
Older Adult 03	Female	70	Married	Vocational School
Older Adult 04	Female	58	Widowed	College and above
Older Adult 05	Male	60	Widowed	Junior High School
Older Adult 06	Male	65	Unmarried/Divorced	Vocational School
Older Adult 07	Female	48	Married	Junior High School
Older Adult 08	Male	52	Married	Vocational School
Older Adult 09	Male	61	Widowed	College and above
Representative from health administrative authorities 01	Female	46	Married	College and above
Representative from health administrative authorities 02	Male	43	Widowed	College and above
Representative from health administrative authorities 03	Male	50	Widowed	College and above
Third-party institution stakeholder 01	Female	39	Widowed	College and above
Third-party institution stakeholder 02	Female	42	Married	Junior High School
Third-party institution stakeholder 03	Male	40	Widowed	College and above

healthcare providers, representatives from health administrative authorities, and third-party institution stakeholders. This sample size was determined to ensure data saturation and a rich tapestry of perspectives. The characteristics of the participants are shown in Table 2.

Data Collection

The researchers thoroughly explained the research purpose and content to the participants, and had them sign the consent forms before gathering data. A paper-based questionnaire was used for the survey, which the participants completed independently. For those unable to complete the questionnaire alone, the researchers provided standard instructions and recorded their answers objectively and accurately.

The quantitative phase of the study involved a survey to assess the demographic profile and service demands of the older adult

population in Hangzhou. A self-made tool labelled as General Information Survey questionnaire was used. It incorporated a series of validated questions focusing on Age, Marital Status, Educational Level, and Pre-retirement Occupation. This questionnaire demonstrated strong construct validity, as evidenced by a Kaiser-Meyer-Olkin (KMO) value of 0.85 and significant factor loadings exceeding 0.5. Furthermore, its high reliability was confirmed by a Cronbach's Alpha coefficient of 0.9, ensuring accurate and reliable data collection.

Qualitative data was collected through semi-structured interviews. Through literature review, a preliminary interview outline was drafted, and after being modified by two research group members, pre-interviews were conducted with two older adults. Based on the older adults' answers to questions and the difficulty of the interviewees' questions, the interview outline was adjusted promptly. Finally, a formal interview outline was formed. Interviews were conducted in quiet, private spaces to

minimize participant discomfort. After obtaining consent, interviews were recorded and followed a structured outline. Open-ended questioning encouraged participants to express their thoughts and feelings freely. Researchers observed participants' body language and took notes. Techniques like questioning, retelling, and clarification were used to gather comprehensive information. Interviews typically lasted 30-50 minutes, with flexibility for extension as needed.

Data Management and Statistical Analysis

Quantitative data is described using frequency and percentile for statistical analysis. Statistical analysis was conducted using SPSS 26.0.

In the qualitative phase, two researchers transcribed the interview recording. Using the Colaizzi 7-step analysis method of phenomenological data analysis, the interview data was analyzed. Firstly, all transcribed materials were carefully read and statements with significant meaning were extracted. Secondly, repeated viewpoints were annotated and encoded into a theme. On this basis, the detailed and comprehensive description and summary of similar viewpoints were encoded. Finally, it was verified with the respondents to ensure the accuracy of the research findings. The tools employed for this manual analysis included basic office software such as Microsoft Word and Microsoft Excel, which facilitated the organization and tracking of the data, but the core analysis was driven by the interpretative understanding and manual encoding of the transcribed materials. All interviews were digitally recorded and professionally transcribed to ensure accuracy. A detailed audit trail was maintained for quantitative and qualitative data, documenting any changes or decisions made during data analysis. The research team met regularly to discuss the progress and any potential issues, ensuring a collective understanding of the research process.

The convergence of the data involved integrating the quantitative and qualitative data and highlighting the similarities and differences.

Ethical Considerations

The study's protocol was reviewed and approved by the Ethics Committee of Hangzhou Center for Disease Control and Prevention (HZ20220507), ensuring compliance with ethical standards for protecting participants' rights and well-being. Informed consent was obtained from all participants, with adaptations made for those with visual, auditory, or cognitive impairments to ensure comprehension. Confidentiality and privacy were maintained throughout the study, with data being anonymized and securely stored.

Results

Quantitative Phase

Table 3 illustrates the specific service demands of the older adults in Hangzhou, China. The data indicates high demand for various services with bathing assistance being the most sought-after at 99.56%. Meal and cleaning assistance are also in high demand, with 95.48% and 96.81% respectively. Other significant demands include accompanying medical visits (98.90%), home medical care (98.79%), and health check-ups (97.03%).

Older Adults' Demands for Internet Plus Elder Care System

Table 4 shows that the majority at 97.3% of the older adults had higher demands and preference on the requirements for Internet Plus services from large-scale medical institutions compared with in-home Internet Plus where older adult care and family support needs are at 91.3%. It is notable, however, that more than 90% of the population expressed demands across the categories.

Qualitative Phase

Four themes and ten subthemes emerged based on the thematic analysis.

Theme 1: Voices of Older Adults and their Families

In-Home Internet Plus Older Adult Care and Family Support Needs

The verbalizations of the older adults in Hangzhou highlighted their situation in suffering from chronic diseases and facing accidents at home. The personal preferences of the older adults to receive treatment in the comfort of their own homes by their loved ones has been consistently expressed. They expected that the Internet Plus services will enable them to manage minor illnesses within their community and seek hospital care for more severe conditions thereby achieving a more balanced and effective care model that aligns with the demands of both the older adults and their families.

Accessibility Needs for Internet Plus Medical Services

The older adults mentioned that they are particularly vulnerable due to increased susceptibility to organ failure and compromised disease resistance. They said common chronic conditions necessitate ongoing medical attention. They also

Table 3. *Older Adult's demands on Community-based Health and Caregiving Services*

Service Category	Frequency (N=908)	Percentage (%)
Traditional Chinese Medicine and Mental Counseling	905	99.67
Bathing Assistance	904	99.56
Nursing Services	903	99.45
Home Visits	901	99.23
Community Day Care	900	99.12
Emergency Call and Rescue	899	99.01
Accompanying for Medical Visits	898	98.90
Home Medical Care	897	98.79
Education and Training	896	98.68
Health Consultation and Guidance	894	98.46
Intelligent Health Monitoring	891	98.13
Rehabilitation Training	888	97.80
Health Check-ups	881	97.03
Cultural and Entertainment	881	97.03
Cleaning Assistance	879	96.81
Home Older Adults Care Beds	878	96.70
Shopping Assistance	870	95.81

Table 4. *Older Adults' Demands for Internet Plus Care System (N = 908)*

Category of Demands	Frequency (N=908)	Percentage (%)
Requirements for Internet Plus Services from Large-Scale Medical Institutions	884	97.30%
Accessibility Needs for Internet Plus Medical Services	875	96.40%
Community-Based Internet Plus Health Service Center Requirements	868	95.60%
Needs for Internet Plus Holistic Health Maintenance for the Older Adults	857	94.40%
In-Home Internet Plus Older Adult Care and Family Support Needs	829	91.30%

Table 5. Themes and Sub-themes of Qualitative data

Themes	Sub-themes
Theme 1: Voices of Older adults and their Families	In-Home Internet Plus Older Adult Care and Family Support Needs
	Accessibility Needs for Internet Plus Medical Services
	Needs for Internet Plus Holistic Health Maintenance for the Older Adults
	Community-Based Internet Plus Health Service Center Requirements
	Requirements for Internet Plus Services from Large-Scale Medical Institutions
Theme 2: Striking the balance	
Theme 3: Meeting demands and supply	
Theme 4: Holistic perspectives	Yearning for Home-Based Medical Services
	Emotional Appeal for Emergency Medical Assistance
	Longing for a Sense of Community Belonging
	Diverse Views on Technology-Assisted Services
	Positive Evaluation of the 'Internet Plus' Healthcare Model

felt that the current allocation of healthcare resources fall short resulting in long wait times for appointments and brief consultations. They mentioned that these inefficiencies impose significant time costs during medical visits. They expected that there may be a more efficient healthcare system to enhance their access to medical care. This system should reduce wait times and improve the quality of medical consultations. They also mentioned that a model that ensures timely and comprehensive medical attention for the older adults can lead to better health outcomes and reduced patient and family burdens.

Needs for Internet Plus Holistic Health Maintenance for the Older Adults

The older adults mentioned that a comprehensive health maintenance cycle for the older adults focusing on chronic disease management and overall well-being was also necessary. They felt that regular health checks and management are crucial since such encompass early prevention, treatment, and social care. They stated that integrating early warning mechanisms to monitor the health status of at-risk elderly individuals and providing timely alerts is essential. The older adults also mentioned that they want the continuous and periodic care for older adults with chronic conditions.

Community-Based Internet Plus Health Service Center Requirements

The older adults recognize that community health centers in Zhejiang Province have a dual mission: creating electronic health records for seniors and providing a comprehensive range of services, including treatment, prevention, and health education. However, these centers face challenges related to low resource utilization, inadequate medical staff, and insufficient equipment. The older adults mentioned that primary healthcare facilities, including community health centers, experience low bed occupancy rates, indicating an underutilization of available resources. The root cause lies in these centers' limited medical teams and equipment. The older adults stated that community health centers need to be enhanced by integrating electronic health records and implementing better resource management practices. This integration would enable real-time health monitoring and more effective coordination with larger hospitals.

Requirements for Internet Plus Services from Large-Scale Medical Institutions

The older adults stated that large, comprehensive medical institutions are critical in older adult care that offer advanced

medical interventions and remote consultations. However, they felt that there was a mismatch between available medical resources and the care demands of seniors. This situation often results in prolonged bed occupancy and increased strain on the healthcare system. Their verbalizations include recommendations to develop an electronic healthcare and welfare public service platform to fast-track the delivery of services and avoid wasting resources.

Health administrative authorities mentioned that it is pivotal to create a cohesive ecosystem for older adult care services in Hangzhou. They emphasized the need to analyze data to assess service demands and health trends among the older adults, ensuring rational and prompt allocation of resources. Innovations include integrating medical, rehabilitation, and wellness services to serve the older adults better. They also stated that policies encourage healthcare professionals from larger institutions to provide services at the grassroots level, enhancing local older adult care and enabling remote consultation and diagnostic services. They felt that by focusing on these strategic initiatives, health administrative authorities contribute significantly to balanced service models that meet the multifaceted needs of Hangzhou's aging population.

Theme 3: Meeting demands and supply

Third-party institutions stated that it is crucial in bridging the gap between medical care and older adult care services. They mentioned that the focus of services on providing high-end integrated care is currently lacking. These entities offer value-added services such as medical consultations, health education, and meal management that emphasize community-based home care. They also mentioned the need to enhance community infrastructure, including daycare and activity centers. These centers should be conveniently located and well-equipped with necessary facilities for healthcare, rehabilitation, and daily living support. A coordinated supply and demand strategy aims to diversify older adult care services, stimulate consumption, and establish robust service networks. This involves supporting various development models to meet seniors' medical and rehabilitation needs, including institutional care, community integration, and home monitoring.

In addition, older adults also verbalized that comprehensive information platforms for older adult care services are being established. These platforms facilitate personalized services and interconnectivity of care resources. Specialized services like psychological counseling and legal consultation are also part of this development.

Lastly, they also mentioned that there is a strong focus on standardizing the older adult care service industry. Improving

industry standards, management services, safety protocols, and evaluation systems is essential. Measures such as licensing, qualification assessments, and regular inspections are being implemented to elevate the overall quality of senior care services.

Theme 4: Holistic perspectives

Yearning for Home-Based Medical Services

The qualitative interviews in this study unveil the direct aspirations of the older adults regarding medical services. A 72-year-old retired teacher's words directly convey the need for home-based medical services:

"My mobility is limited, making every trip to the hospital a struggle. If doctors could provide services at home, it would be incredibly convenient for me."

This reflects the strong desire of the older adults to receive medical care within the comfort of their homes.

Emotional Appeal for Emergency Medical Assistance

The older adults expressed a profound need for emergency medical assistance during the interviews. A participant living alone shared her feelings after a fall at home:

"I lay on the ground, unable to move, and felt utterly hopeless at that moment."

Her genuine narrative reveals the urgent need of the older adults for prompt medical response in emergencies.

Longing for a Sense of Community Belonging

When discussing community services, the older adults used simple language to express a longing for a sense of community belonging. One interviewee said,

"I hope the community can be like an extended family, offering more care and support to us older adults."

This shows that the older adults wish for community services to provide warmth and care, enhancing their sense of belonging to the community.

Diverse Views on Technology-Assisted Services

Older adults with different educational backgrounds hold varying perspectives on technology-assisted services. A highly educated older adult stated,

"I prefer to use smart devices to manage my health, but I hope these technologies can be simpler."

In contrast, an older adult with a lower level of education expressed a preference for face-to-face assistance:

"I'm not very familiar with these new technologies; I would prefer someone to help me in person."

These voices highlight the need to consider the varying acceptance levels and ability to use technology when designing community services for the older adults.

Positive Evaluation of the 'Internet Plus' Healthcare Model

The older adults' evaluation of the 'Internet Plus' healthcare model contributes positively to service innovation. One older adult's comment reflects the potential of this model: "This system allows me to communicate with doctors at any time, which makes me feel very reassured." This indicates that despite varying levels of familiarity with technology, the older adults value the immediate medical communication and sense of security that technological means can provide.

Mixed Methods Results

Table 6. Comparative Analysis Table of Quantitative and Qualitative Data

Themes/Sub-themes	Quantitative Results	Qualitative Findings	Analysis
Theme 1: Voices of Older adults and their Families			
Subtheme 1a: In-Home Internet Plus Older Adult Care and Family Support Needs	91.3% of respondents need in-home internet-assisted elder care.	Participants expressed a desire for home-based medical services and family support.	High demand for home-based care services is consistent across both datasets.
Subtheme 1b: Accessibility Needs for Internet Plus Medical Services	96.4% prefer medical services through the Internet Plus model.	Participants desire efficient healthcare access and reduced wait times.	Both datasets show a strong inclination towards technology-enabled healthcare access.
Subtheme 1c: Needs for Internet Plus Holistic Health Maintenance for the Older Adults	94.4% consider comprehensive health maintenance important.	Older adults need ongoing support for chronic disease management.	There is a clear need for continuous health support as identified in both quantitative and qualitative data.
Subtheme 1d: Community-Based Internet Plus Health Service Center Requirements	95.6% indicate a need for community health service centers enhanced by Internet Plus technology.	Older adults recognized the challenges faced by community health centers.	Quantitative data shows demand for services, while qualitative data offers insights into service challenges.
Subtheme 1e: Requirements for Internet Plus Services from Large-Scale Medical Institutions	97.3% have high demand for services from large medical institutions within the Internet Plus framework.	Older adults verbalized the importance of advanced medical interventions and remote consultations.	Both datasets highlight the importance of large Internet plus services provided by medical institutions
Theme 2: Striking the balance		Health administrative authorities emphasized the need for a cohesive ecosystem for older adult care services.	This theme indicate the need for a strategic approach to older adult care services.
Theme 3: Meeting demands and supply		Third-party institutions highlight the need for high-end integrated care and community infrastructure.	This theme focused on the role of third-party institutions in older adult care services.
Theme 4: Holistic perspectives			

Subtheme 4a: Yearning for Home-Based Medical Services		Participants expressed a strong preference for receiving medical care within their homes.	This sub-theme is unique to qualitative data, revealing the comfort and convenience sought by older adults.
Subtheme 4b: Emotional Appeal for Emergency Medical Assistance		Participants expressed a profound need for prompt emergency medical response.	This sub-theme highlights the urgency of emergency medical needs.
Subtheme 4c: Longing for a Sense of Community Belonging		Older adults wish for community services that provide warmth and care, enhancing their sense of belonging.	This sub-theme reflects the emotional connection that older adults seek from their community.
Subtheme 4d: Diverse Views on Technology-Assisted Services		Older adults with different educational backgrounds have varying perspectives on technology-assisted services.	This sub-theme highlights the need for diverse service options.
Subtheme 4e: Positive Evaluation of the 'Internet Plus' Healthcare Model		Older adults value the immediate medical communication and sense of security provided by technological means.	This sub-theme reflects the overall positive perception of older adults on the 'Internet Plus' model.

Discussion

Exploring the "Internet Plus" Health Care Model

The older adults in this study overwhelmingly expressed enthusiasm for the "Internet Plus" healthcare model, highlighting its potential to enhance medical services and address their specific needs. Their feedback provides invaluable insights for developing a more responsive health care system.

The "Internet Plus" model offers a promising approach to address the increasing demand for efficient and effective healthcare services (Thompson & Brailer, 2004). Integrating technology into daily care empowers seniors to manage their health thereby improving care quality and promoting independence.

This model fosters a sustainable care ecosystem through community engagement and digital governance (Turner et al., 2021). Enhancing communication and information access supports informed decision-making and better health outcomes. The model also demonstrates potential in managing chronic diseases through telemedicine, remote monitoring, and personalized care that have resulted in the reduction of burdens on the healthcare systems.

In contrast to traditional models, the "Internet Plus" approach is more proactive, technology-driven and patient-centered

(Dasgupta, 2023). It addresses challenges such as resource limitations, accessibility issues, and lack of personalized care prevalent in traditional systems (Oliver et al., 2014). By leveraging technology, the model expands access, enhances efficiency, and personalizes care (Yang et al., 2021), aligning with the growing emphasis on digital health solutions for vulnerable populations.

While concerns about digital divides exist, the findings suggest that with appropriate support, older adults can successfully adopt "Internet Plus" services (Choudrie et al., 2022). A comprehensive approach combining technology with social and emotional support is essential to ensure equitable access to quality healthcare.

Deepening the Understanding of the "Internet Plus" Health Care Model

The "Internet Plus" health care model emerges as a transformative innovation in older adult care which underscores both the quantitative demand and qualitative narratives that provide its significance. The significant preference for in-home care facilitated by Internet technology and the strong demand for accessible medical services through this model underscore its potential to revolutionize service delivery. These findings reflect a societal shift towards technology-mediated solutions and highlight the pressing need for immediate and personalized care as vividly captured in the

qualitative accounts of elderly individuals who cherish the comfort and the convenience of home-based medical services. The high percentage of respondents favoring in-home care facilitated by internet technology underscores a deep-seated desire for autonomy and dignity in aging. This preference speaks to the importance of preserving one's living environment and maintaining social connections within the familiar surroundings of home. Integrating technology into this setting enables seamless access to medical services resulting in the enhancement of the quality of life while reducing the burdens of institutionalized care.

Strong preference for accessible medical services through the "Internet Plus" model highlights the importance of personalized care tailored to individual needs (Xiong et al., 2024). This model allows for the customization of treatment plans, timely monitoring of health conditions, and prompt interventions that have addressed the unique healthcare challenges faced by the older adult population.

Thematic analysis of qualitative interviews highlights the vulnerability of the older adults to chronic illnesses and accidents at home. These insights underscore the urgency for a proactive healthcare system that can prevent, detect, and manage health issues early on. The "Internet Plus" model emphasize remote monitoring and telemedicine in order to provide a viable solution to such undertaking by enabling continuous health surveillance and timely interventions (Su et al., 2022). Review of the development and prospect of telemedicine. Intelligent Medicine.).

Previous research on healthcare innovations for the older adults has often focused on developing and adopting telemedicine and remote monitoring technologies (Magdalena et al., 2015). While these studies have acknowledged the potential of technology to improve access to medical services, they have often been limited in scope as these focus primarily on specific technologies or patient populations.

The current study builds upon this foundation by comprehensively analyzing the "Internet Plus" healthcare model which encompasses a broader range of services and technological solutions. Furthermore, by combining quantitative and qualitative data, this study offers a nuanced understanding of the preferences, needs, and experiences of elderly individuals within this framework.

In contrast to studies highlighting barriers to technology adoption among the older adults such as lack of digital literacy or privacy concerns, the current study reveals a high acceptance and enthusiasm for the "Internet Plus" model (Dezuanni et al., 2017). This suggests that with proper education and support, the older

adults can actively embrace and benefit from technological advancements in healthcare.

Advancing the Design of the "Internet Plus" Platform

In refining the design of the "Internet Plus" platform, it is imperative to delve deeper into the key findings derived from the high demand for services among the older adults and their families. The staggering percentages for bathing assistance and home medical care underscore a pressing need for a holistic and responsive healthcare ecosystem. These findings echo the community's sentiments and necessitate a platform beyond mere service provision to embody a proactive and supportive approach.

The overwhelming demand for bathing assistance and home medical care stresses on the older adults' desire for dignity, autonomy, and convenient access to essential healthcare services within their homes (Alamri, 2016). This underscores the importance of designing the "Internet Plus" platform which emphasize user-centricity and ensure that services are tailored to meet the unique needs and preferences of the older adult population.

The need for real-time monitoring and swift medical intervention highlights the platform's potential to revolutionize healthcare delivery by leveraging technology to bridge the gap between patients and medical professionals (Singh et al., 2024). This necessitates the integration of advanced technologies such as wearables, AI-powered diagnostics, and telemedicine capabilities to ensure seamless communication and prompt response times.

When comparing the current findings with previous studies on healthcare technology for the older adults, it becomes evident that while many platforms have focused on enhancing access to information and education, few have successfully addressed the holistic needs of the older adults such as physical assistance and real-time medical support (MacAdam, 2008). The "Internet Plus" platform emphasize modular core elements like electronic medical record management and remote physiological data transmission that aim to fill this gap by providing a comprehensive solution that integrates various aspects of healthcare.

Moreover, the platform's modular design which allows for flexibility and scalability, significantly advances traditional, rigid systems. This said approach aligns with recent trends in healthcare technology that emphasize the importance of adaptability and of interoperability in addressing the diverse needs of different patient populations.

Suggestions for Enhancing Senior Care through Integrated 'Internet Plus' Health Platforms

To enhance the quality of life for older adults, it is essential to construct a comprehensive platform that integrates medical care, senior care, rehabilitation, and health management services. This integrated system should create a seamless interface among older adults, their families, and healthcare providers in order to ensure accessibility and personalized healthcare. Regional medical institutions play a pivotal role in this ecosystem by establishing community health records and delivering critical services such as disease diagnosis and emergency care. The platform must support these institutions in order to leverage technology and overcome resource allocation and management challenges.

Furthermore, the platform should be designed to empower older adults and their families thereby enabling them to take a more active role in health management. By providing tools for self-evaluation and physiological data monitoring, the platform can help shift the focus from public management to personal management in order to transform senior health maintenance approaches.

Addressing the complex care needs of older adults requires an integrated approach that balances medical and caregiving support. The "Internet Plus" model emphasizes on technology-enhanced services that consequently presents a promising solution. However, it is crucial to recognize the diverse perspectives on technology-assisted services among older adults based on qualitative interviews conducted. This diversity underscores the need for a platform design that is inclusive, adaptable, and sensitive to the varying levels of technological familiarity and acceptance among seniors in order to ensure that the platform meets the multifaceted needs of the aging population effectively.

Strengths and limitations

The study's integration of a mixed-methods approach offers a robust analysis by combining quantitative data for broader trends with qualitative insights for a deeper understanding of older adults' acceptance of the 'Internet Plus' healthcare model in Hangzhou. In addition, representative sampling strategy ensures that the findings reflect a diverse older adult population resulting in the enhancement of the study's applicability.

However, the study faces limitations. Its geographical focus on Hangzhou may limit the transferability of results to other regions with different technological infrastructures and cultural contexts. The assumption of a certain level of technological literacy among participants might overestimate the general elderly population's

capacity to engage with the 'Internet Plus' model fully. The potential for selection bias also exists as compared to those more inclined to participate may not reflect the entire spectrum of the older adult population's views.

Despite these limitations, this research provides actionable insights into enhancing older adult care through technology by contributing valuable perspectives for policymakers and healthcare providers.

Conclusions

The findings of this study underscore the substantial potential of the "Internet Plus" model to revolutionize older adult care in Hangzhou and similar urban settings. By integrating technology with community-based services, this model can create a robust, efficient, accessible, and personalized care framework that addresses the multifaceted needs of the aging population.

To fully realize the potential of the "Internet Plus" model, future policy and practice can provide priority on the optimization of the platform to meet the specific needs of the older adults. It includes ensuring seamless integration into daily life while providing efficient service delivery, personalized care, and a strong sense of security and belonging.

By focusing on these areas, policymakers and practitioners can contribute to developing a healthcare system that meets the challenges of an aging population while enhancing the quality of life for older adults.

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ABOUT THE AUTHORS



Yun-Zhao Lin earned a Bachelor of Nursing degree from Taizhou University, Zhejiang Province, China, in 2012, followed by a Master of Medical Science in Nursing from Wenzhou Medical University, also in Zhejiang

Province, China, in 2015. Currently, he is pursuing a Ph.D. in Nursing at Saint Louis University. Additionally, he holds a position as a faculty member at Hangzhou City University, located in Hangzhou City, Zhejiang Province, China. His academic endeavors concentrate on medical and caregiving integration policies, community-based research, and disease prevention strategies.



Meng-Meng Lin graduated with a bachelor's degree from Xi'an University of Finance and Economics in Shaanxi Province, China, in 2015. Currently, she is pursuing a Master's degree at Saint Louis University and holds a position as a faculty member at Hangzhou City University, located in Hangzhou City, Zhejiang Province, China. Her academic pursuits are centered on medical management models, health policy, and community governance.



Erlinda C. Palaganas, PhD, RN, FAAN, is a retired professor of the University of the Philippines. She continues to serve as a professorial lecturer with the Ph.D. Programs of UP Baguio and UP Manila, and the School of Advanced Studies of the Saint Louis University, Baguio City. She earned her Bachelor of Science in Nursing from the UERMMMCI-CON, her Master of Public Health from the UP Manila College of Public Health, and her Ph.D. in Nursing from the University of Sydney, Faculty of Nursing, NSW, Australia. Her research interests include issues surrounding the social determinants of health, often using the social critical lens of conducting research. She is considered the prime mover of Qualitative Research in the nursing and health related field in the country.

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Statement

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