Theoretical Exploration of Strategies to Enhance the Application Ability of Digital Health Resources for the Elderly

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Abstract: This paper explores strategies to enhance the application ability of digital health resources among the elderly, addressing the challenges posed by the digital divide. As the global population ages, effective health management for seniors becomes increasingly important. The study highlights the significance of technology training and education, social support networks, and design thinking in improving elderly individuals' digital health literacy. By implementing comprehensive training programs and fostering community support, seniors can gain the necessary skills and confidence to utilize digital health tools effectively. The paper also emphasizes the need for age-friendly technology that caters to the specific needs of older adults. Successful case studies, such as China's "Healthy China Action" and the U.S. "Senior Tech" program, demonstrate the positive impact of these strategies. Ultimately, enhancing the elderly's capacity to use digital health resources is a collaborative effort that requires ongoing innovation, policy support, and community engagement, ensuring that seniors can enjoy the benefits of modern healthcare technologies while improving their quality of life.

Keywords: Digital Health Resources; Elderly; Application Ability

1. Introduction

As the global population ages, the health management of elderly individuals has garnered increasing societal attention. The advancement of digital technology offers new avenues for health management, including health monitoring devices, telemedicine services, and health management applications. However, many elderly individuals face significant challenges in utilizing these digital health resources due to factors such as age, cognitive ability, and social environment(Leath BA et al., 2018). Therefore, enhancing the application ability of digital health resources among the elderly is not only an urgent social task but also a crucial means to improve their quality of life.

Firstly, the application of digital health resources can significantly enhance the effectiveness of health management for the elderly. For instance, smartwatches and health monitoring devices can continuously track physiological indicators such as heart rate and blood pressure, enabling the timely identification of potential health risks. Additionally, telemedicine services allow elderly individuals to receive professional medical consultations and diagnoses from the comfort of their homes, greatly improving the accessibility and convenience of healthcare services. Health management applications can provide personalized health advice and reminders, assisting the elderly in better managing their health conditions(Sekhon H et al., 2021).

Secondly, enhancing the application ability of digital health resources among the elderly can alleviate the burden on families and society. With the increasing proportion of elderly individuals,

traditional healthcare systems face immense pressure. Effectively utilizing digital health resources can reduce the need for frequent medical visits among the elderly and lessen the caregiving burden on family members. Furthermore, through telemedicine services and health management applications, elderly individuals can achieve better self-management and independent living, thereby decreasing their reliance on social resources(Gaylord S et al., 2022).

However, many elderly individuals still encounter significant barriers when using digital health resources. These barriers primarily manifest in several areas: first, a lack of technical knowledge and skills. Many elderly individuals struggle to master the operation of digital devices due to insufficient training. Second, psychological barriers exist, as some elderly individuals are concerned about privacy breaches and cybersecurity issues, leading to reluctance in using these emerging digital tools. Third, there is insufficient social support; elderly individuals often find it challenging to obtain effective assistance when facing technical difficulties(Nguyen XV et al., 2024).

Consequently, addressing the enhancement of elderly individuals' application ability of digital health resources has become a pressing issue. The goal of this study, to improve older adults' ability to use digital health resources, fills a notable gap in existing research. While prior studies have addressed the technological barriers elderly individuals face, few have proposed comprehensive, targeted strategies for overcoming these barriers that are specifically tailored to this demographic. This study introduces new insights by proposing a multi-pronged approach that includes technology training, social support systems, and the development of age-friendly technologies, all aimed at improving elderly individuals' interaction with digital health resources. A key contribution of this study is its focus on the role of community networks, including government, non-governmental organizations, and commercial enterprises, in creating sustainable support systems that can address the multifaceted challenges faced by older adults in using digital health resources.

Moreover, the integration of theoretical frameworks—such as the Technology Acceptance Model (TAM), Social Support Theory, and Lifelong Learning Theory—adds depth to the exploration of elderly individuals' interactions with digital technologies. TAM helps explain how perceived usefulness and ease of use influence older adults' attitudes toward technology. Social Support Theory highlights the role of familial, communal, and professional networks in fostering confidence and overcoming technology-related barriers. Lifelong Learning Theory emphasizes the need for continuous education and adaptation to new technologies, which is critical in empowering older adults to effectively use digital health resources. By exploring how these theories interact, this paper offers a comprehensive approach to understanding the factors influencing elderly adults' acceptance of digital health resources.

This paper also aims to explicitly address the heterogeneity within the elderly population, acknowledging that variations in cognitive abilities, socio-economic status, and living conditions necessitate personalized and flexible approaches to the implementation of digital health technologies. Elderly individuals with cognitive impairments or limited digital literacy may face unique challenges that require specialized interventions.

In conclusion, the study's contributions are significant because it not only identifies barriers to the adoption of digital health technologies but also offers actionable strategies to bridge these gaps. By integrating multiple levels of support and applying relevant theoretical frameworks, this study provides a more holistic and practical approach to improving elderly individuals' digital health literacy.

2.Current Barriers to Digital Health Resource Utilization Among the Elderly

The proliferation of digital technology has increased opportunities for older adults to use digital health resources (e.g., health monitoring devices, telemedicine, health management applications) in health management. However, despite the potential benefits, many older adults are unable to fully utilize these resources due to barriers in technological literacy, cognitive ability, and social support.

Specific groups, such as low-income and solitary elderly individuals, face even greater challenges when confronting the digital divide (Smith et al., 2020).

2.1 Challenges of the Digital Divide

The digital divide refers to the gap between different groups in their use of information technology, particularly in internet access, device ownership, and technological application skills. For older adults, this divide significantly impacts their health management and quality of life (Jones & Anderson, 2018). Although many older adults are willing to accept assistance from digital health resources, they often encounter numerous obstacles, especially in technology operation, information acquisition, and privacy protection (Williams, 2019).

2.2 Challenges for Specific Groups

Low-income elderly: Due to economic constraints, low-income older adults are unable to afford smart devices or internet service fees. This disadvantages them in accessing digital health services such as telemedicine and health monitoring devices (Miller & Thompson, 2017). Additionally, low-income elderly may lack access to professional technical support and training, leading to unfamiliarity or fear of digital tools, further exacerbating the technological gap (Smith et al., 2020).
Solitary elderly: Solitary older adults not only face social isolation but often lack necessary technical support. While they could benefit from digital health resources like telemedicine and health management applications, they frequently encounter difficulties in device operation, technical maintenance, and emergency assistance due to the absence of family support (Khan et al., 2021). Social isolation also limits their exposure to the latest digital health tools, increasing the difficulty of technology adoption (Johnson, 2018).

Cognitively impaired groups: Older adults often experience cognitive decline with age, particularly those with cognitive impairments or dementia. They frequently face significant challenges in operating complex devices, understanding health data, and using telemedicine. For these groups, the complexity and usage barriers of technology make digital health resource utilization even more challenging (Lee & Williams, 2019).

2.3 Comprehensive Influencing Factors

The digital divide among older adults is closely related to economic status and cognitive ability, and is further constrained by a lack of social support systems. For instance, low-income and solitary elderly may lack adequate social support from family members, communities, or professional services (Jones & Anderson, 2018). Without appropriate support, they may abandon attempts to use technology due to distrust or operational difficulties (Williams, 2019). To bridge these gaps, collaboration among government, social organizations, and communities is crucial (Miller & Thompson, 2017). These groups require targeted solutions such as regular technology training, simplified device interfaces, and community support services to better integrate into the digital health management environment.

3.Theoretical Framework

This study integrates the Technology Acceptance Model (TAM), social support theory, and lifelong learning theory to explore how these theories can be combined to explain and promote the acceptance of digital health resources among older adults. While these theories provide valuable perspectives on older adults' use of digital health technologies, they have limitations in practical application, particularly when addressing the heterogeneity of the elderly population. These limitations are primarily manifested in the following aspects:

3.1 Limitations of the Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), proposed by Davis (1989), emphasizes perceived

usefulness and perceived ease of use as core factors determining an individual's acceptance of new technology. However, TAM has notable limitations when applied to older adults. Cognitive differences and varied technology experiences among older adults may lead to biases in understanding and evaluating technology. TAM assumes technology acceptance is based on rational decision-making processes, but older adults are often influenced by emotional factors and social support, such as advice and encouragement from family and community members (Chen & Chan, 2014). Additionally, TAM fails to adequately consider background factors like social isolation or physical health issues that older adults may face when using digital health resources, which can significantly impact their assessment of technology's perceived usefulness and ease of use (Peek et al., 2014). Consequently, TAM may not fully explain older adults' motivations and behaviors in accepting new technologies.

3.2 Limitations of Social Support Theory

Social support theory emphasizes the influence of family, friends, community, and professional support on individual behavior, particularly in technology acceptance (Choi & DiNitto, 2013). However, the application of social support theory to older adults has limitations. Access to social support is not equally available to all older adults, especially those with low incomes, living alone, or in rural areas. Many older adults lack adequate family support or opportunities for professional technical guidance (Cotten et al., 2013). Furthermore, the quality and types of social support vary, and not all support effectively promotes technology acceptance among older adults. For example, technical assistance from family members may differ due to age, health conditions, and understanding of technology, potentially leading to confusion or frustration among older adults using digital health technologies. Therefore, social support theory overlooks the imbalance in social support resources and quality differences when explaining technology acceptance among older adults, affecting its applicability.

3.3 Limitations of Lifelong Learning Theory

Lifelong learning theory advocates for continuous learning of new technologies by older adults to adapt to changing social environments (Jarvis, 2004). However, the application of lifelong learning theory to older adults faces obstacles in practice. Older adults often experience cognitive decline, physical health issues, and a lack of learning resources (Czaja et al., 2006). Many older adults struggle to participate in regular technology learning activities due to health conditions or cognitive impairments, limiting their technology learning process. Despite lifelong learning theory promoting self-directed learning, older adults often lack sufficient learning resources, particularly in technology training (Mitzner et al., 2010). Consequently, implementing lifelong learning theory among older adults faces multiple challenges, especially in areas lacking suitable learning platforms and support.

3.4 Integrated Framework Combining the Three Theories

To address the limitations of TAM, social support theory, and lifelong learning theory when applied to older adults, this study proposes an integrated framework. This framework aims to provide a more comprehensive theoretical perspective for understanding and promoting the acceptance of digital health resources among older adults.

Extension of TAM: Interaction between External Support and Perceived Usefulness While TAM provides an effective framework for explaining individual technology acceptance, it primarily focuses on perceived usefulness and ease of use of the technology itself, without fully considering external factors, particularly social support. Among older adults, perceived usefulness and ease of use are often influenced by external environments, not just the technology itself. Social support, such as assistance from family members, community, or professional support personnel, can effectively

increase older adults' trust and acceptance of technology (Barnard et al., 2013). For example, when family members provide guidance, older adults' perceptions of technology use become more positive, enhancing their willingness to use digital health resources. Therefore, incorporating social support into the TAM framework can more comprehensively explain older adults' behavioral patterns in using digital health technologies, reflecting the moderating role of the social environment on technology acceptance.

Multidimensional Role of Social Support: A Support System for Enhancing Technology Acceptance Social support theory suggests that individual behavior is influenced by social networks. In the process of accepting digital health technologies, social support is not limited to emotional support but also includes technical guidance, information sharing, and practical operational assistance. Especially among older adults, the quality and accessibility of social support networks play a crucial role in their acceptance of new technologies (Cresci et al., 2010). For older adults lacking family support, living alone, or in low-income environments, the absence of social support may lead to delays or refusal in technology acceptance. Therefore, this framework emphasizes building multi-level social support networks, including government, community, and non-governmental organizations, to effectively address the shortcomings of older adults in technology application and enhance their technology acceptance and self-management capabilities.

Adaptability of Lifelong Learning: A Continuous Process of Skill Enhancement and Confidence Building Lifelong learning theory emphasizes that individuals can continuously update their skills through ongoing learning and adaptation to technological developments in society. However, among older adults, cognitive abilities, health conditions, and lack of learning resources often limit the depth and breadth of learning. Therefore, this framework proposes adaptive learning strategies when applying lifelong learning theory, designing personalized learning modules based on different older adults' cognitive levels, health conditions, and technological foundations. This personalized learning path ensures that older adults receive appropriate support in the technology learning process and gradually improve their understanding and application of digital health resources, even with limited cognitive abilities. Through practice and repeated learning, older adults can not only enhance their technology use skills but also increase their trust in technology, thereby improving their acceptance of digital health tools (Heart & Kalderon, 2013).

Innovation and Application of the Integrated Framework By integrating TAM, social support theory, and lifelong learning theory, this study constructs a comprehensive framework to address the shortcomings of single theoretical models. In this framework, technology acceptance depends not only on individual perceptions of the technology itself but is also influenced by social support networks and closely linked to the learning process of older adults. Specifically, social support provides emotional and substantial assistance, lifelong learning offers pathways for skill enhancement, and TAM helps understand how older adults evaluate the usefulness and ease of use of technology. These three elements interact to jointly promote digital health technology acceptance among older adults.

Furthermore, this framework emphasizes personalization and adaptability, recognizing the high heterogeneity of the older adult population. Older adults have diverse needs and acceptance patterns for digital health technologies under different cognitive levels, health conditions, and social backgrounds. The innovation of this framework lies in providing a comprehensive, multidimensional perspective that not only focuses on individual-level technology acceptance but also includes the role of external support environments and continuous learning, ensuring that each older adult can effectively participate in digital health management under suitable conditions.

4. Strategies for Enhancing Digital Health Literacy Among Older Adults
4.1 Technical Training and Education

Technical training and education are essential components in enhancing older adults' ability to

utilize digital health resources. Through systematic and diverse training approaches, older adults can acquire necessary technical knowledge and skills, thereby improving their efficiency in using digital health resources.

(1) Training Content and Objectives: Technical training courses should encompass both fundamental knowledge and practical skills. The fundamental knowledge section should cover basic operations of smartphones and tablets, such as powering on/off, unlocking screens, and installing applications. The practical skills section should focus on specific methods for using digital health resources, including setting up health monitoring devices and downloading and using health management applications. Comprehensive training enables older adults to use these technological tools more proficiently, enhancing their health management effectiveness.

(2) Training Methods and Approaches: Training methods should be diversified to meet the learning needs of different older adults. In-person group training is a common approach, allowing older adults to understand and master technical operations through face-to-face instruction and interaction. Online training serves as an effective complement, particularly for geographically dispersed or mobility-impaired older adults. Through video tutorials and online Q&A sessions, older adults can learn independently at home, unrestricted by time or location. To enhance training effectiveness, interactive teaching methods such as group discussions and simulated operations can be employed, allowing older adults to learn and reinforce knowledge through practice.

(3) Trainer Qualifications and Support: The quality of training courses largely depends on the instructors' expertise. Professionals with extensive technical knowledge and teaching experience should be selected as instructors to ensure the accuracy and practicality of the training content. Additionally, adequate technical support staff should be available to provide immediate assistance for technical issues encountered by older adults during training. For example, some community centers have invited experienced technicians as instructors and equipped dedicated technical support teams to ensure each participant successfully completes the training.

(4) Training Evaluation and Feedback: Prompt evaluation and feedback should be conducted after training. Opinions and suggestions from older adults can be collected through questionnaires and face-to-face interviews to understand their experiences and gains during the training process. Furthermore, subsequent follow-up observations can assess older adults' performance in practical applications, further refining training content and methods. For instance, a study has shown that regular follow-ups and evaluations can identify issues in training and allow timely adjustments to training programs, thereby improving training effectiveness.

In conclusion, technical training and education are crucial means of enhancing older adults' ability to use digital health resources. Through systematic training content, diverse training methods, professional instructors, and effective evaluation and feedback mechanisms, older adults' technical proficiency can be significantly improved, helping them better utilize digital health resources and enhance their quality of life.

Figure 1: Conceptual Diagram of the Technology Training Course Design for Elderly Individuals

4.2 Social Support and Group Interaction

Social support and group interaction are crucial strategies for enhancing older adults' ability to use digital health resources. By establishing community support networks and encouraging experience sharing and mutual assistance activities among older adults, their confidence in using technology can be strengthened, leading to improved application effectiveness.

(1) Community Support Networks: Currently, many communities provide basic services for older adults, such as health check-ups, social activities, and fundamental medical support. However, a significant gap exists in support for digital health technologies. In low-income, remote areas, or among elderly individuals living alone, insufficient social support resources make it challenging for these seniors to fully benefit from digital health technology support. The uneven distribution of social support resources and the lack of comprehensive services limit the potential of communities in promoting the application of digital health technologies among the elderly population. To construct a more effective and sustainable community support system, resource integration must be approached from a systems science perspective. Systems science emphasizes a comprehensive understanding of complex systems, effectively combining multiple subsystems (such as government, communities, non-governmental organizations, and commercial companies) to form a synergistic whole. Within this framework, governments, NGOs, and commercial companies can form a robust support system through complementary roles and resources.

Specifically, governments can provide infrastructure and technological platforms for the elderly through policy formulation and financial support. This may include offering free digital health devices or internet services to low-income seniors and promoting the integration of public health systems with digital health platforms. Additionally, governments should establish laws and regulations to ensure the privacy and data security of older adults using these technologies. Non-governmental organizations (NGOs) typically play crucial roles in social services and humanitarian aid. They can provide targeted technical training, social support, and psychological guidance based on government policies. This is particularly important in helping isolated or mentally vulnerable seniors overcome technology fears and enhance their trust and application of digital health technologies. For instance, community volunteers can offer one-on-one technical guidance to help older adults feel more secure and comfortable using health monitoring devices. Commercial companies can provide technological support and innovative solutions, such as developing health management devices, telemedicine platforms, and health apps specifically designed for older adults. These enterprises can not only provide user-friendly technologies through product innovation but

also collaborate with governments and NGOs to promote the widespread adoption of digital health technologies among the elderly population. Commercial companies can also leverage their technological and resource advantages to offer customized services, such as designing personalized health management plans based on individual health conditions. To ensure the sustainability of this support system, the synergy of resources from various parties is crucial. Firstly, the integration of multi-party resources should focus on building "shared platforms." For example, governments and NGOs can collaborate with commercial companies to establish an integrated digital health platform. This platform would not only offer health monitoring and telemedicine services but also connect to community volunteers and social service personnel, providing real-time support and feedback. Such an information-sharing platform would enable older adults to access needed support anytime and anywhere, avoiding resource waste due to information barriers. Secondly, financial support and long-term investment are equally important in guaranteeing the sustainability of the support system. Governments should regularly evaluate the effectiveness of the support system and gradually adjust funding and resource allocation based on changing needs of the elderly population to ensure long-term stable operation of the system. Simultaneously, commercial companies can provide necessary financial support through public welfare cooperation and corporate social responsibility (CSR) activities, while promoting further development of the support system through technological innovation.

Although this systematic support model has a strong theoretical foundation and practical significance, it still faces several challenges in implementation. Cooperation between different resource providers may be constrained by institutional factors and interest distribution. Finding a balance among multiple interests and ensuring that all parties can maximize their roles will be a focus of future research and practice. Furthermore, the construction of the support system needs to be flexible and adaptive to address the evolving needs of the elderly population and find the most suitable support pathways in different social and cultural contexts.

(2) Experience Sharing and Mutual Assistance Activities: Experience sharing and mutual assistance activities are important components of community support networks. Through these activities, older adults can learn from each other's experiences and skills in mutual exchanges, enhancing their self-efficacy. For instance, some community centers have organized "Tech Expert" selection activities, encouraging older adults to showcase their insights on using digital health resources. These activities not only allow older adults to learn practical technical knowledge but also help them feel recognized and supported by their peers.

(3) Positive Effects of Social Support: Social support has significant positive effects on older adults' use of digital health resources. Firstly, social support can alleviate psychological stress in older adults and increase their confidence in using new technologies. Research shows that when older adults feel supported by family, friends, and community, they are more willing to try new technologies. Secondly, social support can promote interaction among older adults, strengthening their social connections. For example, some community centers have organized smartphone interest groups for older adults, providing opportunities for them to meet like-minded friends and discuss technology topics together.

In conclusion, social support and group interaction are effective strategies for enhancing older adults' ability to use digital health resources. By establishing community support networks and encouraging experience sharing and mutual assistance activities among older adults, their confidence in using technology can be significantly enhanced, improving their application effectiveness. Future research should continue to explore more innovative social support models to better meet the needs of older adults.

Figure 2: Community Support Network for Elderly Individuals

4.3 Design Thinking and Age-Friendly Technology

Design thinking plays a crucial role in enhancing the digital health resource utilization capabilities of older adults. This user-centered innovation approach optimizes the user experience for seniors through three main aspects. First, a deep understanding of the needs and pain points of older adults is achieved by collecting feedback on existing digital health resources through surveys and interviews. Second, age-friendly technologies are developed based on these insights, such as large font displays, voice input and output features, and simplified operational processes, addressing specific challenges faced by seniors during usage. Finally, user experience is continuously improved through iterative testing and optimization, with older adults invited to participate as design consultants throughout the process. For instance, user testing is conducted to gather feedback, allowing for timely adjustments to design plans. This approach not only enhances the convenience and satisfaction of older users but also boosts their confidence in using technology. By applying design thinking, digital health resources can be created that better meet the actual needs of older adults, effectively improving their utilization capabilities and overall quality of life.

Figure 3:

Figure 3:Development of Age-Appropriate Technologies

5. Case Study
5.1 Successful Domestic and International Cases
5.1.1 Domestic Case: The "Healthy China Action" Elderly Health Management Program

The "Healthy China Action" is a national health promotion initiative launched by the Chinese government in 2019. It aims to improve the overall health of the population, with a particular focus on elderly people. The program has implemented various digital health management measures for seniors. By promoting the use of smart health devices and digital platforms, the initiative supports elderly individuals in self-monitoring their health and accessing telemedicine services, thereby enhancing their health management capabilities(Sun, Y. et al., 2021).

For example, seniors can use the "Elderly Health Management APP" to track vital health metrics, such as blood pressure and blood glucose levels. The platform also enables remote consultations with healthcare providers, offering convenient health advice and telehealth services. In addition, wearable devices, such as smartwatches and glucometers, monitor seniors' health in real-time, providing early warnings for potential health risks.

One of the key success factors of the program is strong governmental support and adequate funding. Government backing has not only facilitated the distribution of medical resources but also fostered collaboration with local governments and healthcare institutions, allowing the program to reach various communities. The digital health platform, specifically designed with elderly users in mind, incorporates features such as simplified interfaces, enlarged fonts, and voice prompts, greatly enhancing seniors' acceptance and user experience with technology.

However, the program also faces challenges, particularly in terms of technology acceptance and the digital divide. While elderly individuals in urban areas are relatively more exposed to these technologies, those in rural regions face limitations due to poor infrastructure and low internet penetration. Consequently, access to digital health management opportunities is constrained for rural seniors. Despite targeted training and services, some elderly people still exhibit fear and distrust toward new technologies, which affects their engagement with the program.

This case highlights important lessons: When advancing digital health initiatives for the elderly,

it is crucial to consider not only policy and financial support but also the technological literacy and digital infrastructure available to seniors. Special attention must be given to rural and remote areas, where targeted digital training and provision of hardware devices are essential. Additionally, family members and community support play a critical role in helping elderly individuals overcome technical barriers and building their trust and participation in digital health management.

5.1.2 International Case: The "Senior Tech" Program in the United States

The "Senior Tech" program in the United States is a collaborative initiative launched by local governments and nonprofit organizations. Its goal is to enhance the digital skills of elderly individuals, helping them better integrate into modern society, particularly in the area of health management through digital technology(Tricarico JM et al., 2022). The primary objective of the program is to help seniors overcome their fear of new technology and improve their digital literacy, enabling them to confidently use smart devices and health management applications.

The program offers a series of technology training courses tailored to seniors, teaching them how to use smartphones, health management apps, telemedicine systems, and other digital tools. For instance, elderly participants can use smartwatches to monitor health data in real time, including heart rate, step count, and sleep quality, and communicate remotely with healthcare providers via health management apps to receive personalized health guidance.

One key factor behind the program's success is its collaborative model. By partnering with local healthcare institutions, technology companies, and community organizations, the program provides a one-stop service that includes not only digital skills training but also support for the use of smart health devices and related technical assistance. Moreover, the program emphasizes the role of the community, regularly hosting training sessions and interactive events at community centers to strengthen social ties among seniors and reduce feelings of isolation.

In addition, the program has adapted its teaching methods to the specific needs of elderly individuals, using simplified instruction and hands-on practice to help seniors overcome their resistance to new technology. This approach allows them to gradually integrate digital tools into their daily lives.

However, the program also faces challenges, particularly due to individual differences among participants. Given the diversity within the elderly population, some seniors have lower levels of technology acceptance and lack the motivation or patience to engage in the training, leading to lower participation rates. Furthermore, the dependence on digital devices has raised concerns. Some seniors struggle with using and troubleshooting smart devices, and the lack of adequate technical support limits the effectiveness of their usage.

The "Senior Tech" program offers several valuable insights: The application of digital health resources is not merely about providing devices and technology; it is equally important to design training programs and technical support systems that are tailored to the needs of the elderly. Effective digital engagement requires personalized training, combined with support from family members and the community. Additionally, ongoing technical assistance and troubleshooting mechanisms are crucial to enhancing seniors' confidence and reliance on digital health tools.

5.2 Insights and Reflections from Case Studies

Through the analysis of successful domestic and international case studies, several key lessons and insights can be drawn, providing valuable guidance for enhancing the digital health resource application capabilities of elderly individuals.

First, the adoption of diversified strategies is crucial. A comprehensive ecosystem that integrates multiple methods can more effectively address the diverse needs of seniors. Second, optimizing user experience is at the core of success. It is essential to design interfaces that are simple and intuitive, while also ensuring that processes are easy to navigate from the perspective of the elderly. Third,

establishing a social support network—comprising community assistance and family involvement—plays a significant role in boosting seniors' confidence in using technology.

Finally, implementing continuous improvement and feedback mechanisms is vital. Regular follow-up and evaluations allow for timely adjustments to services, promoting the long-term development of the program.

These lessons highlight that improving the digital health resource application abilities of elderly individuals requires collaborative efforts across multiple dimensions. Future research should continue to explore innovative approaches and strategies to better meet the evolving needs of this demographic.

6. Conclusion and Future Directions

This paper explored various strategies to enhance elderly individuals' ability to utilize digital health resources, including technology training and education, social support and group interaction, as well as design thinking and age-appropriate technologies. Through theoretical analysis and case studies, we found that these strategies play a significant role in improving seniors' technological capabilities. Technology training and education enable elderly individuals to acquire essential knowledge and skills, enhancing their efficiency in using digital health resources. Social support and group interaction, through the establishment of community networks, encourage experience-sharing and mutual assistance, which in turn boosts seniors' confidence in using technology. Design thinking and age-appropriate technologies, by understanding the specific needs of the elderly, develop digital health resources that are better suited to their requirements, thereby improving their user experience and satisfaction.

However, despite the progress made, challenges and limitations remain. First, the acceptance and willingness of elderly individuals to adopt technology still need improvement. Many seniors are hesitant about new technologies due to concerns over privacy risks and operational difficulties. Second, the current training and educational systems are not yet fully developed, with limited coverage and effectiveness. Additionally, the establishment of social support networks requires further strengthening to better meet the needs of the elderly. Finally, the research, development, and promotion of age-appropriate technologies need more investment and support to ensure they truly address the practical needs of seniors.

Future research should focus on the dynamic alignment of technological innovation with the evolving needs of the elderly, as well as how policy support can further optimize their use of digital health resources. Specifically, innovative training methods such as virtual reality and AI-assisted learning could be explored to enhance the learning outcomes of seniors. Additionally, the construction and management of social support networks should be strengthened, providing more community-based services, such as technology consultations and psychological counseling. Moreover, increased support for the research and development of age-appropriate technologies is crucial, with a push for standardization and regulation of these technologies.

Finally, policy measures should be introduced to encourage and support the adoption of digital health resources among the elderly. These could include financial subsidies and technical assistance to foster the widespread application of digital health solutions.

In conclusion, enhancing elderly individuals' capacity to use digital health resources is a long-term and complex task that requires the collective effort of society. Through ongoing exploration and practice, it is believed that more effective strategies and methods can be developed, enabling seniors to better enjoy the convenience and benefits of digital health resources in the future.

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