

Research on the Digital Divide and Outpatient Appointment Barriers Among the Elderly

Hongjia Quan, Rumei Li

The Second Affiliated Hospital of Harbin Medical University, Harbin 150086, Heilongjiang, China

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Abstract: With the continuous deepening of population aging and the rapid advancement of digital healthcare in China, most fair and transparent outpatient registration quotas are allocated via mobile applications, leaving very limited on-site registration quotas for older people. However, the existence of the digital divide exposes older people to numerous barriers in the process of outpatient appointment registration, seriously undermining their medical convenience and sense of access. Adopting a combination of literature research and logical analysis, this paper systematically sorts out the specific manifestations of older people's digital divide and outpatient appointment barriers, deeply analyzes multiple causes of such barriers, and proposes targeted solutions combined with current practices of age-friendly medical construction. It aims to provide theoretical reference and practical lessons for bridging the older people's digital divide, optimizing outpatient appointment services, safeguarding older people's medical rights and interests, and facilitating the realization of healthy aging.

Keywords: Older people; Digital divide; Outpatient appointment; Medical access barriers; Age-friendly transformation

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1. Introduction

At present, China's aging process is accelerating continuously. By the end of 2023, the population aged 60 and above had reached 297 million, accounting for 21.1% of the total population, and the medical service demands of the elderly group are increasingly urgent. Meanwhile, digital transformation drives the upgrading of medical service models, and outpatient appointments have become an important measure to optimize the allocation of medical resources and reduce waiting time for older people seeking medical treatment. Nevertheless, the rapid iteration of digital technology has given rise to the digital divide among older people. Most older adults struggle with outpatient appointments due to an inability to use smart devices and unfamiliarity with online operations ^[1]. This divide not only aggravates the difficulty of medical treatment for older people but also runs counter to the healthy aging strategy. Therefore, systematic research on the manifestations, causes, and solutions of older people's digital divide and outpatient appointment barriers is of important practical and theoretical significance for improving the elderly medical service system, protecting

the basic health rights and interests of older people, and promoting the universal benefit of digital healthcare.

2. Specific manifestations of older people's digital divide and outpatient appointment barriers

2.1. Insufficient access to digital equipment and a weak foundation for appointment

Access to digital equipment is the prerequisite for outpatient appointments, while older people have obvious shortcomings in equipment acquisition and use, forming fundamental barriers to outpatient appointments. Restricted by economic conditions, some older adults are not equipped with smart terminals such as smartphones and tablets, and still rely on basic feature phones that cannot log in to appointment platforms for operation. Even if they own smart devices, most are second-hand, old devices eliminated by their children, suffering from lagging operation and blurry screens, which affects the fluency of appointment operations.

In addition, elderly residents in rural and remote areas face insufficient network coverage with unstable 4G and 5G signals, and some lack home network access, making them unable to stably access online appointment systems. They can only rely on offline registration and lose the convenience brought by online appointments ^[2]. This access-level divide puts older people at a disadvantage from the very beginning of outpatient appointments, making it difficult for them to enjoy the dividends of digital healthcare.

2.2. Deficient digital operational competence and blocked appointment process

Older people's inadequate digital operational ability is the core manifestation of outpatient appointment barriers and a direct reflection of the digital divide in usage. Outpatient appointments involve multiple procedures, including downloading apps, registration and login, binding medical cards, selecting departments and doctors, and confirming appointment information. Due to declining cognitive ability and memory loss, the elderly struggle to quickly master the operational process.

Most older adults cannot download or update apps, feel confused by operations such as entering SMS verification codes and filling in identity information during registration, and even fail to make appointments due to operational errors. Some elderly individuals who complete registration cannot accurately locate the appointment entrance or select appropriate medical time slots. They are often at a loss when faced with complex interface design and cumbersome operational steps ^[3]. Furthermore, the operational procedures of some appointment platforms are constantly updated, making newly learned methods obsolete quickly. The learning pace of older people cannot keep up with technological iteration, further increasing the difficulty of making appointments.

2.3. Inadequate digital information literacy and poor appointment experience

Insufficient digital information literacy makes it hard for older people to identify valid information in outpatient appointments, leading to misunderstandings and impairing their appointment experience and medical safety. At present, various medical appointment platforms are emerging in large numbers. Some unofficial platforms engage in false publicity and illegal charging. Lacking the ability to distinguish information, older people are prone to falling into fake appointment channels, which not only results in appointment failure but also may lead to personal information leakage and property losses.

On official appointment platforms, a large amount of medical information and appointment rules are expressed in professional and obscure language, which older people can hardly understand accurately.

They often make appointments with mismatched departments for their conditions, resulting in low medical efficiency ^[4]. Meanwhile, older people pay little attention to reminder messages and medical instructions after successful appointments. Some miss the appointment time or fail to carry the relevant documents, causing the appointment to be invalid and wasting time and energy.

3. Countermeasures for older people's digital divide and outpatient appointment barriers

3.1. Strengthen the cultivation of older people's digital literacy and improve their independent appointment ability

Improving older people's digital operational ability is the core measure to break outpatient appointment barriers and bridge the digital divide. Targeted training should be carried out in accordance with the physiological and cognitive characteristics of older people, balancing practicality and operability. A hierarchical and classified training system should be established. Based on differences in age, educational level, and digital foundation of the elderly, training content should be precisely set.

For the advanced-aged, low-educated elderly with no digital foundation, training should focus on basic outpatient appointment operations to reduce learning difficulty, emphasizing basic steps such as powering on smart devices, downloading and installing apps, and finding appointment entrances ^[5]. For older people with certain digital foundations, training should focus on skill improvement, including optimizing appointment procedures, distinguishing appointment information, and handling abnormal problems, helping them cope with various emergencies in the appointment process.

The training mode combines offline centralized teaching with one-on-one targeted assistance. Relying on community service centers, senior universities, medical institutions, and elderly care service institutions, volunteers, medical staff, and community workers are invited to provide on-site guidance and hands-on teaching of the entire outpatient appointment process. Meanwhile, easy-to-understand graphic operation manuals and slow-speed short video tutorials marked with key operational nodes should be produced for older people to check and review repeatedly, reducing memory difficulty.

The core role of family assistance should be strengthened, guiding children to take the initiative to provide guidance. Children are encouraged to accompany the elderly to learn smart device operation and outpatient appointment procedures in their spare time, explaining key steps such as app registration, medical card binding, department and doctor selection, and appointment confirmation at a pace acceptable to older people, and correcting operational errors in a timely manner to build their operational confidence.

In addition, efforts should be made to change older people's resistance to digital technology. Through case explanation and on-site demonstration, older people can intuitively perceive the convenience of online appointments, such as queuing-free and time-saving, enhancing their willingness to take the initiative to learn, guiding them to attempt independent appointments and gradually get rid of dependence on others to achieve independent integration into digital healthcare ^[6]. For solitary and empty-nest elderly, community support forces should be relied on to arrange special personnel for regular door-to-door guidance, ensuring they can complete outpatient appointments smoothly without assistance.

3.2. Build regular community digital service stations

Communities can build regular digital service stations, integrating retired nursing staff, nursing interns, grid

staff, retired teachers, technical volunteers, and other forces. Fixed service hours are set up in community activity centers and elderly care service stations to provide convenient services of learning and consulting anytime for older adults needing outpatient appointments.

The service stations are equipped with simple operation guide display boards and enlarged-font process schematic diagrams, as well as spare smart devices for older people to practice operation. Volunteers provide special tutoring on common appointment problems such as account login, SMS verification code reception, and appointment time adjustment.

Furthermore, communities can regularly hold “Digital Medical Experience Day” activities, cooperating with local medical institutions to carry out interactive sessions such as on-site simulated appointments and online consultation demonstrations, enabling older people to familiarize themselves with operational procedures in real scenarios. For older people with limited mobility, communities can launch a dual service of door-to-door agency + hands-on teaching, assisting with appointment making while patiently explaining operational key points to help older people gradually master independent appointment skills, effectively opening up the “last mile” of digital medical treatment for older people.

3.3. Optimize age-friendly design of appointment platforms and lower operational threshold

In view of the insufficient age-friendly design and great operational difficulty of current outpatient appointment platforms, platforms should be upgraded and optimized to fully adapt to the physiological characteristics and usage habits of older people and effectively lower the appointment threshold. Simplify the operation interface, cut redundant functional modules, and highlight the core functions of outpatient appointments. Key modules such as appointment entrance, department selection, doctor inquiry, and appointment records should be placed in prominent positions on the homepage with enlarged fonts and improved color contrast to avoid unclear operation content caused by tiny fonts and blurred colors.

Integrate AI recognition and activate voice recognition to enable fast intelligent registration via voice command. Add age-friendly functions including voice guidance, one-click appointment, screen magnification, and night mode. Voice guidance should adopt a slow and gentle broadcast speed to clearly explain each operational step and help the elderly complete appointments accurately. The one-click appointment function can be directly associated with commonly used departments and doctors to reduce operational steps ^[7].

Optimize the registration and login process by reducing unnecessary verification procedures, supporting quick login with ID cards and children’s agency binding, allowing children to complete account registration and information improvement for older people, and avoiding appointment failure caused by complex verification operations. For older people prone to password forgetting, add convenient password retrieval channels supported by SMS verification and children-assisted retrieval to improve operational convenience.

Enhance platform adaptability, optimize compatibility with feature phones and old smart devices, and fix problems such as crashes and lag to ensure smooth appointment operation. Increase investment in network infrastructure in rural and remote areas, improve the stability of 4G and 5G signals, and ensure older people can stably access online appointment systems without network interference. Improve platform service support by adding a special artificial customer service hotline with extended service hours, arranging professional personnel to provide appointment consultation, operational guidance, and problem troubleshooting, solving various difficulties encountered by older people during appointments, and improving their appointment experience.

3.4. Improve the social assistance system and consolidate the safety net of guarantees

Build a diversified and collaborative social assistance system, integrate resources from all parties to provide all-around support for older people to cross the digital divide and complete outpatient appointments smoothly, and consolidate the bottom-line guarantee. Give play to the role of grassroots community governance, establish a digital assistance mechanism for the elderly, and set up assistance teams composed of community workers, volunteers, and medical staff to provide personalized services such as door-to-door appointment making, accompanying medical treatment, and appointment information reminder for special elderly groups, including solitary, advanced-aged, and disabled seniors, solving their difficulty in independent appointment ^[8].

Communities should regularly carry out exchange activities on outpatient appointment operations, build a platform for mutual learning among older people, and encourage digitally skilled older adults to drive their peers to learn, forming a good atmosphere of mutual assistance and progress. Meanwhile, set up age-friendly appointment service posts in community service halls with special personnel on-site to guide operations and provide appointment consultation and information verification services for older people.

Optimize publicity and guidance methods and expand publicity channels with both online and offline promotion. Offline, popularize outpatient appointment knowledge, operational methods, and precautions to older people through community announcements, billboards, household visits, and paper manuals, interpreting appointment rules in plain language. Online, release simplified appointment tutorials via social channels commonly used by older people to ensure accurate coverage of publicity information.

At the same time, create a social atmosphere of caring for and assisting older people to cross the digital divide, guiding medical institutions, enterprises, and social organizations to take social responsibilities actively. Encourage enterprises to participate in age-friendly technology research and development and assistance services, donating smart devices, and providing free network services for older people ^[9]. Strengthen training for service personnel to enhance their service awareness and patience, guide them to take the initiative to care about older people's operational difficulties, and offer more tolerance and help, avoiding dampening older people's learning enthusiasm due to poor service attitude.

3.5. Improve the policy guarantee mechanism and promote service connection and optimization

Strengthen policy guidance, improve supporting policies, clarify the responsibilities of medical institutions, platform operators, communities, and other relevant parties, and promote the implementation of various age-friendly measures. Strictly implement national policies on convenient medical treatment for older people, requiring medical institutions at all levels to retain sufficient manual registration windows, reasonably allocate on-site registration quotas for older people, and refrain from arbitrarily reducing or canceling offline registration services to protect their rights to offline registration.

Increase investment in digital medical construction of grassroots medical institutions, promote the launch of online appointment services in grassroots hospitals, optimize the allocation of appointment quotas with preferential allocation to the elderly to facilitate nearby medical treatment and convenient appointments. Establish and improve a policy supervision and assessment mechanism, regularly inspect the implementation of age-friendly services by medical institutions and appointment platforms, and supervise and rectify units that fail to implement policies strictly, reduce manual windows or allocate registration quotas unreasonably, so as to protect the legitimate medical rights and interests of older people ^[10].

Promote in-depth connection between online and offline services, optimize appointment procedures, realize synchronous information update to diagnosis and treatment systems and medical insurance systems after successful appointments, reduce on-site verification and queuing time for older people, and give full play to the convenience of online appointments. Promote the interconnection of appointment platforms across different hospitals to realize universal accounts and information sharing, avoiding repeated app downloading and account registration for the elderly, and further lowering appointment difficulty.

4. Conclusion

The digital divide and outpatient appointment barriers among older people are prominent social issues against the backdrop of overlapping aging and digitalization, which not only affect the medical convenience and sense of gain of older people but also restrict the advancement of the healthy aging strategy. Their formation results from the combined effect of multiple factors, including the elderly's physiological and cognitive characteristics, insufficient age-friendly technological supply, imperfect social support system, and poor connection between policy and medical systems.

To solve this problem, we should base our efforts on the needs of older people, coordinate forces from all sides, bridge the digital divide, and break appointment barriers by strengthening digital literacy cultivation, optimizing age-friendly platform design, improving social assistance, and perfecting policy guarantees. Only in this way can older people better enjoy the convenience of digital medical treatment, protect their basic health rights and interests, promote the goal of universal access to basic medical and health services, and build a warmer and more inclusive aging society.

Disclosure statement

The authors declare no conflict of interest.

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