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Perceptions of Online Dental Appointment Booking and Barriers to Its Adoption Among Older Adults: A Qualitative Study in the Jazan Region of Saudi Arabia

Mohammed Jafer

Dental Public Health Division, Department of Preventive Dental Science, College of Dentistry, Jazan University, Jazan 45142, Saudi Arabia; majafar@jazanu.edu.sa

Abstract

Background: Despite ongoing advances in digital technology and e-health, older adults are sometimes excluded from technological innovations. These challenges are evident in the use of digital health platforms. **Objective:** To explore perceptions of online dental appointment booking and the barriers to its adoption among older adults in Jazan who had not previously used the service. **Methods:** A qualitative interview study was conducted to explore barriers through in-depth interviews with individuals aged ≥60 at the Dental School of Jazan University. Data were analyzed thematically using an inductive coding approach, with themes developed initially in Arabic and subsequently translated into English. **Results:** 27 participants (both males and females) were interviewed, and the saturation point was reached at the 26th interview. None of the participants had completed an online dental appointment booking successfully. Based on the interview analysis, five major themes emerged from exploring older adults' opinions and views on online dental appointment bookings. Challenges faced by older adults included poor digital skills, unreliable internet access, lack of family support, distrust of the technology, and cultural tendencies toward reactive healthcare seeking, which were encompassed into five major themes. **Conclusions:** Within the study sample, older adults in the Jazan region faced complex, interrelated technological, psychological, and social barriers to using online booking systems. Participants suggested human assistance, visual guidance, and flexible booking policies as potential ways to improve accessibility; however, the feasibility and effectiveness of these approaches require further evaluation.

Keywords: barriers; dental; older adults; Jazan; qualitative; online appointment

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1. Introduction

The influence of the digital revolution is evident in various sectors, with healthcare being no exception [1]. Digital health refers to the use of information technology and electronic tools to enhance the delivery of healthcare services [1,2]. In dentistry, these technologies have introduced new opportunities for both dental professionals and patients [2]. One notable advancement is online appointment booking, which enables patients to schedule appointments through digital platforms without direct interaction with staff. The process typically requires patients to log into a website and select a convenient time [3].

Dental health service delivery in Saudi Arabia has undergone substantial transformation over recent years [4]. The system has evolved from providing basic oral care to offering comprehensive dental health care. Digital health technology has played a major

role in this transformation, with the primary objective of improving patient outcomes [4]. Despite these advancements, disparities persist in access to and equitable adoption of digital health care services. This phenomenon, known as the "digital health paradox," refers to the uneven distribution of digital health technology benefits due to variations in digital literacy, infrastructure, and access among different social groups [5]. These disparities are influenced by factors such as age, sex, socioeconomic status, education, residence, and disability status [5]. Consequently, technologically marginalized groups, particularly older adults, continue to face disadvantages [6].

The World Health Organization reported that the global population of individuals over 60 years old reached 1.1 billion in 2023 [7]. This demographic is associated with increased loneliness and a higher prevalence of chronic diseases, with a lower tendency to pursue digital health compared to younger cohorts [6]. In Saudi Arabia, older adults constitute approximately 5.5% to 6.9% of the total population [8]. While around 37% of older adults have adequate access to and utilize dental healthcare services, this group continues to experience a high burden of oral healthcare needs [9]. These data highlighted a substantial gap between the availability of services and their actual utilization among older adults [9].

In addition to the age-related challenges older adults face, regional disparities in healthcare delivery further complicate the situation [10]. This is especially evident in some rural areas in the Jazan region in southwestern Saudi Arabia. A recent survey reported that only 31% of the population in the Jazan region resided in areas where they could drive to a nearby clinic/hospital, and only 40% could reach a dental clinic within a 30-min drive [10]. This reflects an infrastructural and geographical barrier faced by older adults who are particularly vulnerable when accessing care. In this context, implementing online dental appointments could be a practical solution to reduce these barriers and improve access [10].

Despite the potential benefits of digital services, research evaluating their use and the barriers to adoption among older adults in the Jazan region remains limited. Understanding this population's perceptions of online dental booking services is essential. Accordingly, this study aims to explore older adults' perceptions of online dental appointment booking and to identify barriers that may hinder its adoption in the Jazan region of Saudi Arabia.

2. Materials and Methods

2.1. Study Design

A qualitative descriptive study design was employed, utilizing in-depth, semi-structured interviews. This methodology was selected to facilitate a direct, practice-oriented exploration of older adults' perceptions, expectations, and perceived barriers regarding the use of online dental appointment booking. The semi-structured interview format allowed participants to express their concerns in their own words and enabled the interviewer to explore emerging topics beyond the initial interview guide. An inductive thematic analysis was conducted, ensuring that the coding framework was derived from the interview data rather than predetermined categories. The study was reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ).

2.2. Study Setting and Participant Selection

This study was conducted at the Dental School of Jazan University, Saudi Arabia. Data collection was carried out between August 2025 and January 2026. Potential participants were identified among older adults attending the Jazan Dental School clinics and were approached by the principal investigator immediately after their clinic visits. Convenience sampling was utilized, recruiting eligible clinic attendees present during the data-collection period. Eligibility criteria included being 60 years of age or older, attending the Jazan

Dental School clinic, the ability to communicate in Arabic, and the willingness to provide written informed consent. Prior successful completion of an online dental appointment booking was not required for eligibility; however, participants' screening confirmed that none of the enrolled participants had previously completed an online dental appointment booking successfully. Eligible individuals provided written informed consent in Arabic for participation and publication of anonymized study findings. Audio recording was optional; due to participants' discomfort, interviews were not audio-recorded. Face-to-face interviews were conducted in private consultation rooms immediately after clinic visits to ensure privacy and comfort. Each participant was assigned a unique study code (P01–P27). Field notes, coding records, and analytic files did not include names or other direct identifiers. The principal investigator stored signed consent forms separately from the research data in a secure location and maintained electronic study files in a password-protected folder on an institution-approved device. The principal investigator had sole access to identifiable information. The independent qualitative researcher received only de-identified interview records required for the secondary coding review. Before publication, participant statements were identified only by study code or non-identifying characteristics, and potentially identifying details were removed or generalized.

2.3. Data Collection

The principal investigator (MJ), a faculty member and consultant in Dental Public Health, conducted all interviews and was formally trained in qualitative and quantitative research methods. The investigator was not directly involved in providing dental treatment to the participants or making decisions about their appointments. Before each interview, participants were informed that their participation and responses would not affect their dental care. The interviewer used open-ended, non-judgmental questions and avoided expressing approval or disagreement with participants' responses. After each interview, the investigator prepared reflexive notes to document assumptions, expectations, interactions with participants, and potential influences on data collection and interpretation. These notes were considered during coding and theme development.

Interviews were conducted in Arabic, the participants' native language, and lasted approximately 30–45 min, depending on each participant's pace and the detail of their responses. The duration included time for rapport building and participant-led discussion. Several participants shared broader personal and healthcare experiences beyond the immediate interview questions, as they valued the opportunity to explain their concerns in their own words. The interviewer listened without interruption when appropriate and gently redirected the discussion to the interview guide when necessary. Participants could pause, decline any question, or end the interview at any time.

Due to discomfort expressed by most participants, the interviews were not audio-recorded. Instead, MJ took detailed handwritten field notes during each session and expanded them immediately after the interview.

A semi-structured interview guide was developed and pilot-tested before data collection. The interview guide included questions about: (1) socio-demographic information-such as age, education, residence, and internet use/access; (2) digital behaviour screening-participants were categorized based on prior use of online appointment booking, and, based on their response, they were divided into users (Section A) and non-users (Section B); and (3) general and closing- overall attitudes toward online booking, perceptions of time/effort savings, and additional comments. Section A explored the frequency of use, platforms accessed, device preferences, barriers, facilitators, trust in the systems, and suggestions for improvements, while Section B explored awareness of booking systems, reasons for non-use, decision-making process, and support needs.

The interview guide included separate sections for participants with and without prior experience booking dental appointments online. An initial screening question assigned each participant to the appropriate section. None of the 27 participants had successfully completed an online dental appointment booking. While a few had attempted to access or initiate the process, none completed it. Consequently, only the non-user section was administered. This section examined participants' awareness of the service, reasons for non-use, decision-making processes, perceived barriers, support needs, and suggestions for improvement. No data were collected or analyzed from the user-specific section. Data collection continued until code saturation was achieved, as detailed in Section 2.4.

2.4. Data Analysis

Data analysis began one week after the first interview and proceeded concurrently with data collection. Because the interviews were not audio-recorded, the expanded Arabic field notes constituted the primary analytic material. The study used an inductive, codebook-based thematic analysis, with coding focused primarily on the explicit meanings participants expressed. The inductive thematic analysis approach was used to ensure that the coding framework was derived from the interview data rather than predetermined categories. The principal investigator first read the expanded field notes repeatedly to become familiar with the data. Initial codes were then generated directly from the participants' reported views and experiences. Similar codes were compared, combined, and organized into a preliminary codebook, which was refined iteratively as additional interviews were analyzed. Related codes were grouped into candidate subthemes and broader themes. The candidate themes were reviewed against the full set of interview records to ensure they adequately represented the data. The themes were then defined, named, and organized into the final thematic framework used to report the findings.

Data collection and analysis continued until code saturation was reached. Following each interview, the expanded field notes were compared with the developing codebook to determine whether additional codes or subthemes had emerged. Code saturation was defined as the point at which an additional interview produced no new codes or subthemes relevant to the research question. No new codes or subthemes emerged from interview 26, and interview 27 confirmed this assessment. Coding and theme development were completed manually in Arabic to preserve the participants' intended meanings and the context of their statements. The finalized themes, subthemes, and illustrative participant statements were translated into English only after confirming the thematic structure.

2.5. Quality Assurance and Validation

Several strategies were used to strengthen the credibility and dependability of the analysis. An audit trail was maintained in an analytic research journal to document coding decisions, theme development, methodological decisions, and reflexive observations. Peer debriefing was conducted with Dr. Ibtisam Moafa, an independent qualitative researcher and Dental Public Health specialist. As a credibility check, Dr. Moafa independently coded five expanded interview records. Differences in coding or interpretation were discussed with the principal investigator and resolved through consensus. This secondary review aimed to challenge and refine interpretation rather than calculate statistical inter-coder reliability. Member checking was conducted by sharing a brief Arabic summary of the preliminary themes with five participants and inviting them to comment on whether the themes reflected their experiences. Their feedback was considered during final theme development. Negative-case analysis was also conducted by actively examining the interview records for responses that differed from the dominant patterns and considering these responses during theme refinement. After the thematic framework was finalized, MJ translated the themes,

subthemes, and illustrative participant statements into English. Dr. Moafa reviewed the English wording for conceptual consistency with the original Arabic analysis.

3. Results

A total of 27 Saudi adults aged 60 years or older participated in the study, comprising 16 men and 11 women, with a mean age of 64 years (Table 1). The majority of participants resided in villages surrounding Jizan city. All participants were aware of the availability of online dental appointment booking; however, none had successfully completed a booking through the service. A minority reported attempting to access or initiate the online booking process, but these attempts did not result in a completed appointment. Most participants had limited prior internet experience, primarily restricted to WhatsApp messaging and watching videos. Some participants described unreliable internet connections, and a few reported having no internet access.

Table 1. Sociodemographic Characteristics and Digital Technology Use Among Participants (N = 27).

Characteristic	Category *n* (%)
Age group (years)	
60–64	19 (70.4%)
65–69	6 (22.2%)
≥70	2 (7.4%)
Gender	
Male	16 (59.3%)
Female	11 (40.7%)
Residence	
Urban	11 (40.7%)
Rural	16 (59.3%)
Educational level	
No formal education	4 (14.8%)
Primary education	9 (33.3%)
Intermediate/secondary education	11 (40.7%)
University or higher	3 (11.1%)
Living arrangement	
Living with a spouse or family	27 (100.0%)
Previous smartphone experience	
No smartphone use	1 (3.7%)
Basic use (calls/messaging)	24 (88.9%)
Independent use of multiple applications	2 (7.4%)
Previous internet experience	
Limited use (messaging/videos)	25 (92.6%)
Regular or broader use	2 (7.4%)

Code saturation was achieved at interview 26 and confirmed by interview 27, which generated no additional codes or subthemes. Based on the interview analysis, five major themes emerged from exploring older adults' opinions and views on online dental appointment bookings. The first theme was digital literacy and access barriers that entail the lack of technical skills, anxiety, distress, and internet connectivity issues faced by the older adults. The second theme was a lack of effective support, related to limitations in older adults' support systems. The third theme is related to a preference for in-person visits, including trust, comfort, reliability, and practicality issues associated with online appointment booking. The fourth theme was low perceived need, which included the older adults' reactive health-seeking behaviors. The fifth theme was suggestions for improvement, including

assistance through a person, the effectiveness of the pictorial interface, perceived exclusions, and policy flexibility issues. Table 2 (Coding Table) provides an overview of the themes, subthemes, and supporting participant quotations identified through the data analysis.

Table 2. Coding Table.

Interview Question	Theme	Subtheme/Category	Participants' Quote
Were you aware that you can book dental appointments online? Why haven't you used it?	Digital Literacy & Access Barriers	Lack of technical skill	*"I know the system exists, but it's too complicated for me. I don't even know how to type."*
What problems did you face with internet or device access?		Connectivity limitations	*"Sometimes the internet doesn't work in my house, and I can't rely on it for something important like a doctor's visit."*
Even with access, would you use the system?		Digital anxiety	*"Even if I had internet, I don't trust these websites. What if I do it wrong or press something I shouldn't?"*
Did anyone try to help you use the system?	Limited and inconsistent support	Informal Help Limitations	*"I asked my neighbor once, but I didn't want to keep bothering him. He's busy with his own family."*
Why do you prefer coming to the clinic in person?	Preference for In-Person Booking and Uncertainty About Confirmation	Comfort	*"I just feel better coming here and speaking to a person. I like to see someone and explain my case."*
Do you trust the online booking system to secure you appointment?		Reliability Concerns	*"My friend used the online system, but when he came to the clinic, they said there was no appointment. That made me nervous."*
Do you think walking in is easier than online booking?		Practicality of Walk-Ins	*"It's faster for me to walk in. I know I might wait, but at least I know I'll get seen eventually."*
Why didn't you consider booking in advance?	Low Perceived Need for Advance Booking	Reactive Health-Seeking/symptom-driven approach	*"Honestly, I only come when something hurts. I never think of making an appointment if everything is fine."*
What would make the online booking system easier for you to use?	Suggestions for Improvement	Human-Assisted Solutions	*"It would help if there was someone, I could call who does the booking for me, maybe a number just for older people."*
		Pictorial Interface	*"Pictures would help. I don't read much, but if I see an image, I can understand what to do."*
Do you feel the system meets the needs of older adults?		Perceived Exclusion	*"Sometimes I feel these systems are built without thinking about us. It's like we were not included."*
How else could the online booking system be improved?		Policy Flexibility	*"They should have days for older people—just let us come without going through all these steps online."*

3.1. Digital Literacy & Access Barriers

When asked, "*Are you aware of the online booking system for dental appointments?*", all participants said they were aware of it. However, none had successfully booked an appointment through the service. Several participants reported difficulty using it, mainly because of limited digital literacy and confidence with technology. "*I know the system exists, but it's too complicated for me. I don't even know how to type*," shared one participant aged 67 years. The lack of technical skills in using the digital platforms was a recurring theme throughout the interviews, particularly among participants aged > 65 years. Many of them cited limited or no experience with smartphones, computers, or internet navigation as significant barriers. Basic literacy and reading ability also affected use of these devices. "*My ability to read is very low, especially on a cell phone*", while another admitted, "*I do not read or write… I only use recording*". Confusion and uncertainty about how to begin using these services were expressed by several participants. "*I do not know where to look… and how to find the website*",

shared one. Another simply said, "*It is not easy for me*", reflecting the common feeling of frustration toward navigating digital systems. These challenges suggested that, despite the awareness of online booking platforms, many of the older adults were hesitant to engage with it. Among the few participants who reported attempting to access or begin the online booking process, poor internet connectivity was described as an additional barrier. None of these participants reported successfully booking an appointment online. According to one participant, "*Sometimes the internet doesn't work in my house, and I can't rely on it for something important like a doctor's visit*." Unstable connections, particularly in rural or underserved areas, further discouraged continued use of the online system. Participants expressed frustration with unreliable internet, which not only limited their attempts to use the online booking system but also reinforced broader concerns about technology in healthcare contexts. One participant simply stated, "*I do not have Internet*", highlighting the complete lack of access. Participants cited unreliable or absent internet access and limited digital skills as the main reasons for anticipated difficulties with the online booking system. Among the few who attempted to use the system, these factors contributed to the challenges they reported. These perspectives highlight perceived barriers and a few unsuccessful attempts, rather than an objective assessment of the system's accessibility. Limited experience with online services and accessibility issues often led to frustration, helplessness, and anxiety when participants faced tasks requiring online interaction. Many expressed fear of internet scams and anxiety about using online booking websites incorrectly. One participant remarked, "*Even if I had internet, I don't trust these websites*," while another asked, "*What if I do it wrong or press something I shouldn't?*" Anxiety about making mistakes and potentially losing the opportunity to secure a dental appointment was a common concern.

3.2. Limited and Inconsistent Support

Challenges with digital skills and internet access were compounded by limited and unreliable assistance from family or neighbors. Many participants mentioned they sometimes got help, but it was not always available when they needed it. Several participants hesitated to ask for help because they did not want to feel like a burden or depend on others. One participant said, "*I asked my neighbor once, but I didn't want to keep bothering him. He's busy with his own family*." Others felt embarrassed or uncomfortable asking for help again and again, especially for something they felt they should be able to do themselves. One person said, "*No one to help*." Another explained that even when help was available, it did not always solve the problem: "*My daughter tried but she also could not, so she brought me here*." Some participants also felt social discomfort and emotional barriers. One said, "*I feel shy to ask people to do it for me*,". For most participants, a lack of consistent, skilled, and trusted support was a major barrier to using online dental appointment services.

3.3. Preference for In-Person Booking and Uncertainty About Confirmation

Many participants preferred in-person booking. One participant said, "*I just feel better coming here and speaking to a person*." Another said, "*I like to see someone and explain my case*." They felt that speaking face-to-face was more dependable and comforting than using a digital system. Many believed in-person conversations made it easier to explain their needs and get immediate answers. Some thought that talking to someone in person reduced the chance of misunderstandings or mistakes. A few participants saw online services as unreliable or inconsistent. One shared, "*My friend used the online system, but when he came to the clinic, they said there was no appointment. That made me nervous.*" This shows that their preference for in-person communication may not be only because of feeling comfortable but also about trust and reliability, which they believed technology could not provide. Others worried about not getting confirmation for their online bookings. Some asked, "*How*

do I know if I will have an appointment when I come?" and "*My friend used it and when he went… they told him he did not book*." A common concern was that online booking systems may not offer sufficiently clear physical or verbal confirmation. Participants anticipated that inadequate confirmation could lead to wasted trips or unmet expectations. Several participants indicated this concern discouraged them from using the online service. In contrast, face-to-face interaction felt more reliable. One participant said, "*It is just easier to come and talk to someone in-person*." Practical reasons also mattered. One person said, "*It's faster for me to walk in. I know I might wait, but at least I know I'll get seen eventually*."

3.4. Low Perceived Need for Advance Booking

Another common theme was that many participants did not feel a need to book dental appointments online. Most only sought dental care when they had pain or serious discomfort, rather than for regular check-ups or preventive care. When asked why they did not book in advance, one participant said, "*Honestly, I only come when something hurts. I never think of making an appointment if everything is fine*." Another said, "*If I was not hurt, I would not come*." Many saw dental care as something to do only when needed, not as a regular habit. This symptom-driven approach, combined with digital barriers and lack of support, made online booking even less appealing.

3.5. Suggestions for Improvement

Participants were invited to suggest ways to improve their use of and access to the online dental appointment booking system. A prominent recommendation was to include human assistance throughout the digital process. Many participants indicated that access to someone who could guide them or complete the booking on their behalf would improve their experience. As one participant stated, "*It would help if there was someone, I could call who does the booking for me, maybe a number just for older people*." Another participant emphasized the need for direct support, saying, "*If I can call someone who helps me*." Several participants noted that explaining their needs verbally to a real person made them feel more understood and confident, especially when they were unsure how to proceed online. One participant remarked, "*When I use my voice, I feel better, but the website cannot understand me as a person can*."

Participants also suggested integrating communication tools with which they were already familiar. A common suggestion was to use WhatsApp as an alternative means of making appointments. For example, one participant suggested, "*If I can send audio message… through WhatsApp,*".

Additionally, participants recommended visual aids and pictorial interfaces. Participants who struggled with reading indicated that simple images could help them better understand the booking steps. As one participant explained, "*Pictures would help. I don't read much, but if I see an image, I can understand what to do.*" Emojis or symbols representing each step, such as a tooth icon for dental services, a calendar for booking, or a phone symbol for contact information, were suggested as helpful visual cues. Participants felt that such visual enhancements could reduce confusion, increase confidence, and enable greater independence. Another participant suggested, "*Maybe make pictures or ways that make it easier.*"

Participants also identified policy flexibility as an important area for improvement. Some participants felt that rigid digital requirements, such as mandatory online booking, imposed unnecessary burdens. One participant noted, "*They should give older people a special day to just come in, no booking needed*." Alternative approaches, such as walk-in days or reserved appointment slots specifically for older adults, were proposed. As one participant suggested, "*They should have days for older people—just let us come without going through all these alternatives added. I walk in; older people just come when they need.*" The participant clarified

that they did not wish to avoid the service altogether but rather sought parallel options that matched their capabilities and comfort levels.

In addition to these suggestions, many participants reported experiencing exclusion when using digital booking services. Several participants felt these platforms were not designed to accommodate their needs, which may unintentionally marginalize older adults. As one participant stated, "*Sometimes I feel these systems are built without thinking about us. It's like we were not included*."

4. Discussion

Digital exclusion remains a major challenge to healthcare access for older adults, especially as appointment systems transition to digital platforms [5,6,11]. The present study explored older adults' perceptions of online dental appointment booking and identified barriers to its adoption in the Jazan region. The findings revealed a clear gap between awareness and adoption: while all participants were aware of the online booking, none had completed a booking through its system. Reported barriers included limited digital literacy and access barriers, inconsistent support, preference for in-person booking, uncertainty about confirmation, and low perceived need for advance booking. These factors were believed by the participants to be the main contributors to low system adoption.

Digital literacy and reliable internet connectivity are necessary prerequisites for effective engagement with online health services. Previous research indicated that older adults could face digital exclusion when a lack of familiarity with technology is combined with poor connectivity or a lack of support [11]. In this study, limited digital literacy and unreliable internet connectivity appeared to reinforce each other. Participants who were unfamiliar with online tasks usually had difficulty handling interrupted connections, navigating unfamiliar procedures, or confirming booking completion. Inconsistent access to family support further diminished their confidence and ability to engage independently. This interpretation aligns with a previous study demonstrating that tailored guidance can enhance older adults' confidence in using digital health applications [12]. At the same time, depending on informal support might lead to frustration and a decrease in autonomy [13]. Digital access should therefore be seen as encompassing not only internet availability but also the literacy, confidence, and support needed for effective service use.

Digital barriers alone may not fully explain the lack of adoption of online dental booking. In this sample, dental attendance was primarily driven by symptoms, which may have reduced the perceived value of scheduling appointments in advance. This interpretation aligns with a quantitative study from the Jazan region, where only 45.8% of participants had seen a dentist in the past year, and 33% thought dental care was only needed when they felt pain [14]. Previous research has also found that older adults may delay dental visits because of negative views about aging [15] and low health literacy [16]. While these factors were not measured in this study, the results suggest that older adults may avoid online booking both because of digital barriers and because they do not see value in booking ahead when they seek care only for specific problems.

Trust is an important factor in the adoption of online health systems. Participants' preference for in-person booking appears to arise from a desire for immediate confirmation, direct communication, and a sense of control. Many participants expressed uncertainty regarding whether an online request would result in a confirmed appointment, and some reported hearing negative feedback from relatives or friends. As none of the participants had completed an online booking, these concerns reflect perceived uncertainty and secondhand information rather than direct evidence of system failure. Concerns related to privacy, security, and the potential for errors are consistent with previous research indicating that such issues can negatively influence older adults' trust in digital services [17,18]. Clear

confirmation messages, transparent explanations of the booking process, and access to human assistance may be useful for boosting confidence among potential users.

The study findings, considered alongside the wider literature, indicate that chronological age alone does not adequately explain engagement with digital services. Lee and Coughlin pointed out that confidence, access, perceived usefulness, affordability, and social support are important factors affecting technology adoption in older adults [19]. On the other hand, Weck and his colleagues found that some older populations had relatively high levels of use of digital health services [20]. The present study's findings align more with the first pattern, but differences between studies might be due to variations in prior exposure to digital technology, available infrastructure, education, support, and study setting. Older adults should therefore not be treated as a homogeneous group, and age should not substitute for assessing digital literacy, access, confidence, and support needs.

The findings are interpreted in a complementary way by the Digital Divide Theory and the Unified Theory of Acceptance and Use of Technology (UTAUT) [21,22]. According to the Digital Divide Theory, the structural and capability-related obstacles that the participants mentioned—such as unreliable internet connectivity, limited digital literacy, low confidence, and insufficient support [21]—may prevent a person from taking part in online booking before making an informed decision to adopt it.

UTAUT provides a behavioral perspective on non-adoption. Anticipated difficulty in navigating the service may relate to effort expectancy, while the limited perceived value of advance booking within symptom-driven dental attendance may relate to performance expectancy [22]. Internet reliability and access to assistance reflect facilitating conditions. Secondhand accounts from relatives and friends may also have shaped participants' expectations, although social influence was not directly assessed.

The findings identify several considerations for designing and delivering online dental appointment systems for older adults. Participants recommended clear confirmation of appointment status, visual or voice guidance, human-assisted booking, and an in-person alternative for those unable to complete the process independently. These strategies address concerns about digital literacy, connectivity, trust, and support, although the present study did not evaluate them. Future research should examine the feasibility, acceptability, and effectiveness of these approaches.

Strengths and Limitations

The study has several strengths, including the use of in-depth, semi-structured interviews that facilitated a comprehensive exploration of barriers faced by older adults in accessing online dental appointment systems. This qualitative approach provided rich insights unattainable through quantitative methods. Conducting interviews in the participants' native language within a familiar clinical setting likely enhanced their comfort and led to more authentic responses. Additionally, the iterative thematic analysis, supported by reflexive journaling, peer debriefing, member checking, and an audit trail, bolstered the credibility of the findings. The manual coding performed in Arabic preserved essential linguistic and cultural nuances. However, this study has several limitations. The absence of audio recordings may have resulted in some loss of detail despite careful manual notetaking. Since all interviews and most of the analysis were conducted by the principal investigator, the investigator's professional position may have influenced participants' responses and the interpretation of the data. Reflexive notetaking, peer debriefing, independent review of selected coded records, and member checking strengthened the credibility of the analysis but could not eliminate interviewer, social-desirability, or interpretive bias. Furthermore, recruitment from a single clinical setting and the inclusion of participants with limited experience using digital technology may restrict the transferability of the findings. As none

of the participants successfully completed an online dental appointment booking, this study focused on perceived and anticipated barriers to adoption rather than actual user experience. Although a small number of participants attempted to access or initiate the process, these limited and unsuccessful attempts did not allow for an objective assessment of platform usability, accessibility, reliability, or technical performance. Consequently, the findings reflect participants' perceptions, expectations, and concerns, including those shaped by secondhand accounts. Usability testing that observes participants completing booking tasks is required to determine whether perceived difficulties align with objectively demonstrable issues on the platform.

5. Conclusions

In this clinic-based qualitative study, all participants were aware of online dental appointment booking; however, none had completed an appointment booking through the system. Participants identified digital literacy, unreliable internet connectivity, inconsistent support, uncertainty regarding booking confirmation, and symptom-driven dental attendance as perceived barriers to adoption.

Participants proposed simplified visual interfaces, voice-based support, human-assisted booking, clear appointment confirmation, and flexible alternatives such as designated walk-in access. Further evaluation is required to assess the feasibility and effectiveness of these recommendations.

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References

1. Al-Kahtani, N.; Alrawiai, S.; Al-Zahrani, B.M.; Abumadini, R.A.; Aljaffary, A.; Hariri, B.; Alissa, K.; Alakrawi, Z.; Alumran, A. Digital health transformation in Saudi Arabia: A cross-sectional analysis using Healthcare Information and Management Systems Society' digital health indicators. *Digit. Health* **2022**, *8*, 20552076221117742. [CrossRef] [PubMed]
2. Sultan, A. Digitalization in dentistry: An ongoing revolution shaping the future of dentistry. *IP Int. J. Maxillofac. Imaging* **2023**, *9*, 1–2. [CrossRef]
3. Sugashini, K.; Jayendra, M.; Siddharth, K.R.; Kirubha Shankar, A.; Abishek, M. Online Dental Appointment Booking System. *Int. J. Innov. Res. Eng.* **2023**, *4*, 439–442. [CrossRef]
4. Almajed, O.S.; Aljouie, A.; Alghamdi, R.; Alabdulwahab, F.N.; Laheq, M.T. Transforming Dental Care in Saudi Arabia: Challenges and Opportunities. *Cureus* **2024**, *16*, e54282. [CrossRef] [PubMed]
5. van Kessel, R.; Hrzic, R.; O'NUallain, E.; Weir, E.; Wong, B.L.H.; Anderson, M.; Baron-Cohen, S.; Mossialos, E. Digital Health Paradox: International Policy Perspectives to Address Increased Health Inequalities for People Living With Disabilities. *J. Med. Internet Res.* **2022**, *24*, e33819. [CrossRef] [PubMed]
6. Győrffy, Z.; Boros, J.; Döbrössy, B.; Girasek, E. Older adults in the digital health era: Insights on the digital health related knowledge, habits and attitudes of the 65 year and older population. *BMC Geriatr.* **2023**, *23*, 779. [CrossRef] [PubMed]
7. World Health Organization. *Ageing: Global Population. Questions and Answers*; WHO: Geneva, Switzerland, 2025. Available online: https://www.who.int/news-room/questions-and-answers/item/population-ageing (accessed on 28 October 2026).

8. Bindhim, N.F.; Senitan, M.; Almutairi, M.N.; Alhadlaq, L.S.; Alnajem, S.A.; Alfaifi, M.A.; Althumiri, N.A. Demographic, health, and behaviors profile of Saudi Arabia's aging population 2022–2023. *Front. Aging* **2025**, *6*, 1491146. [CrossRef] [PubMed]
9. Hamasha, A.A.-H.; Aldosari, M.N.; Alturki, A.M.; Aljohani, S.; Aljabali, I.F.; Alotibi, R.F. Barrier to access and dental care utilization behavior with related independent variables in the elderly population of Saudi Arabia. *J. Int. Soc. Prev. Community Dent.* **2019**, *9*, 349–355. [CrossRef] [PubMed]
10. Shubayr, M.A.; Kruger, E.; Tennant, M. Geographic accessibility to public dental practices in the Jazan region of Saudi Arabia. *BMC Oral Health* **2022**, *22*, 249. [CrossRef] [PubMed]
11. Seifert, A.; Cotten, S.R.; Xie, B. A Double Burden of Exclusion? Digital and Social Exclusion of Older Adults in Times of COVID-19. *J. Gerontol. Ser. B Psychol. Sci. Soc. Sci.* **2020**, *76*, e99–e103. [CrossRef] [PubMed]
12. Åberg, C.; Gillsjö, C.; Hallgren, J.; Berglund, M. Experiences of a digital health innovation for older adults living with long-term health problems: The SelfSTRENGTH application. *Educ. Gerontol.* **2024**, *51*, 1004–1019. [CrossRef]
13. Wilson, J.; Heinsch, M.; Betts, D.; Booth, D.; Kay-Lambkin, F. Barriers and facilitators to the use of e-health by older adults: A scoping review. *BMC Public Health* **2021**, *21*, 1556. [CrossRef] [PubMed]
14. Quadri, M.F.; Jafari, F.A.; Albeshri, A.T.; Zailai, A.M. Factors influencing Patients' Utilization of Dental Health Services in Jazan, Kingdom of Saudi Arabia. *Int. J. Clin. Pediatr. Dent.* **2018**, *11*, 29–33. [CrossRef] [PubMed]
15. Sun, J.K.; Smith, J. Self-Perceptions of Aging and Perceived Barriers to Care: Reasons for Health Care Delay. *Gerontologist* **2017**, *57*, S216–S226. [CrossRef] [PubMed]
16. Levy, H.; Janke, A.T.; Langa, K.M. Health Literacy and the Digital Divide Among Older Americans. *J. Gen. Intern. Med.* **2014**, *30*, 284–289. [CrossRef] [PubMed]
17. Pacheco, E. Older adults' safety and security online: A post-pandemic exploration of attitudes and behaviors. *arXiv* **2024**, arXiv:2403.09208.
18. Money, A.; Hall, A.; Harris, D.; Eost-Telling, C.; McDermott, J.; Todd, C. Barriers to and Facilitators of Older People's Engagement With Web-Based Services: Qualitative Study of Adults Aged > 75 Years. *JMIR Aging* **2024**, *7*, e46522. [CrossRef] [PubMed]
19. Lee, C.; Coughlin, J.F. PERSPECTIVE: Older Adults' Adoption of Technology: An Integrated Approach to Identifying Determinants and Barriers. *J. Prod. Innov. Manag.* **2014**, *32*, 747–759. [CrossRef]
20. Weck, M.; Afanassieva, M. Toward the adoption of digital assistive technology: Factors affecting older people's initial trust formation. *Telecommun. Policy* **2022**, *47*, 102483. [CrossRef]
21. Van Dijk, J.A. Digital divide research, achievements and shortcomings. *Poetics* **2006**, *34*, 221–235. [CrossRef]
22. Yang, H.J.; Lee, J.-H.; Lee, W. Factors Influencing Health Care Technology Acceptance in Older Adults Based on the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology: Meta-Analysis. *J. Med. Internet Res.* **2025**, *27*, e65269. [CrossRef] [PubMed]

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