OPEN ACCESS

Saudi Journal of Nursing and Health Care

Abbreviated Key Title: Saudi J Nurs Health Care
ISSN 2616-7921 (Print) |ISSN 2616-6186 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Factors Influencing Older Adults' Awareness and Use of Healthcare Applications and their Effect on Quality of Life: A Field Study in Jeddah City

Yusra Mustafa Obaid[1]*, Talaat Eldemerdash[2]

[1]Teaching Assistant, Healthcare Services and Hospital Administration, King Abdulaziz University, Jeddah, Saudi Arabia
[2]Professor, Healthcare Services and Hospital Administration, King Abdulaziz University, Jeddah, Saudi Arabia

DOI: https://doi.org/10.36348/sjnhc.2026.v09i05.004 | **Received:** 01.03.2026 | **Accepted:** 28.04.2026 | **Published:** 05.05.2026

***Corresponding author:** Yusra Mustafa Obaid
Teaching Assistant, Healthcare Services and Hospital Administration, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Background: The Kingdom of Saudi Arabia has substantially expanded digital health services in recent years through eHealth platforms such as Sehaty and Wasfaty, aligning with the digital transformation pillar of Vision 2030. Despite this rapid expansion, the uptake of healthcare applications among older adults has remained uneven, with barriers reported in digital literacy, usability, and perceived benefit. ***Objective:*** This study aimed to examine the factors influencing older adults' awareness and utilization of healthcare applications and the perceived effect of these applications on quality of life in Jeddah City, Saudi Arabia. ***Methods:*** A cross-sectional quantitative design was adopted. Data were collected in Jeddah City through an electronic questionnaire distributed in June 2025. The target population consisted of Saudi adults aged 30 years and above. A stratified random sampling technique was used based on age, gender, and education level. Out of 316 distributed questionnaires, 227 were returned (71.8% response rate) and 161 valid responses were retained for analysis. A structured Arabic-language questionnaire comprising four sections was developed and pilot-tested. Data were analyzed using SPSS Version 26, including descriptive statistics, chi-square tests, t-tests, one-way ANOVA, Pearson and Spearman correlations, and multiple linear regression, with statistical significance set at $p < 0.05$. Cronbach's alpha coefficients ranged from 0.875 to 0.944 across the subscales, with an overall alpha of 0.889 for the 39-item instrument. ***Results:*** The final sample ($n = 161$) was predominantly female (74.5%), aged between 30 and 40 years (60.9%), held a bachelor's degree (62.7%), and was married (81.4%). Awareness of healthcare applications differed significantly by gender, age, education, job title, occupation, and marital status (all $p < 0.001$). The strongest positive correlates of awareness and utilization were perceived benefit ($r = 0.831$), perceived ease of use ($r = 0.681$), and health and ageing issues ($r = 0.658$). The multiple regression model was significant, $R^2 = 0.727$, $F(6, 156) = 69.26$, $p < 0.001$. Perceived benefit ($\beta = 0.606$, $p < 0.001$) was the strongest predictor, followed by perceived ease of use ($\beta = 0.193$, $p = 0.002$) and health and ageing issues ($\beta = 0.146$, $p = 0.013$). ***Conclusion:*** Perceived benefit and perceived ease of use emerged as the key drivers of older adults' awareness and utilization of healthcare applications in Jeddah City. User-friendly design and clear communication of tangible value are therefore essential to maximize adoption and enhance the quality of life of this growing population.

Keywords: Older adults, healthcare applications, mHealth, eHealth, awareness, perceived benefit, perceived ease of use.

INTRODUCTION

The healthcare sector in the Kingdom of Saudi Arabia has witnessed substantial development over the past decade, reflected in the country's 26th ranking globally in healthcare quality and the Ministry of Health allocation of 80,751.6 million SAR, representing approximately 7% of the total state budget. Within this broader transformation, digital health has emerged as a strategic priority under Saudi Arabia Vision 2030, which positions the adoption of digital tools as a cornerstone for improving efficiency, accessibility, and quality of care.

In line with this vision, the Ministry of Health launched the Sehaty application in 2018 as a comprehensive platform that enables citizens to access a wide range of health services, including appointment booking, electronic medical records, vaccination records, and virtual consultations. The Wasfaty service further complements this ecosystem by providing an electronic

prescription system that links hospitals with community pharmacies, streamlining medication dispensing and follow-up. Together, these platforms represent the backbone of the Saudi digital health landscape.

Although healthcare applications have been widely promoted, their adoption among adults aged 30 years and above has remained uneven. Previous studies have identified a cluster of barriers that may hinder effective utilization, including a lack of digital literacy, limited access to the internet and smart devices, age-related health conditions, fear of making mistakes, perceived ease of use, and perceived benefit. However, most existing evidence has addressed these factors in isolation or in general populations, with limited attention devoted to urban settings such as Jeddah City.

Accordingly, the present study was designed to address this gap by examining six independent variables—lack of digital literacy, lack of internet and devices, health and ageing issues, fear of making mistakes, perceived ease of use, and perceived benefit—in relation to the dependent variable, namely awareness and utilization of healthcare applications and their effect on quality of life.

Significance of the Study

The significance of this study stems from its contribution to both research and practice. Theoretically, it extends the literature on digital health adoption by integrating technology acceptance determinants with ageing-related factors within a Saudi urban context. Practically, the findings are expected to inform policymakers, healthcare providers, and application developers about the most influential drivers and barriers, thereby supporting the design of user-centred interventions aligned with Vision 2030 digital transformation goals.

Aims of the Study

The study aimed to: (1) assess the level of awareness and utilization of healthcare applications—particularly Sehaty and Wasfaty—among adults aged 30 years and above in Jeddah City; (2) examine the relationship between selected individual and technological factors and the level of awareness and utilization; (3) identify the most significant predictors of awareness and utilization; and (4) explore the perceived effect of these applications on the quality of life of the study population.

METHODOLOGY

Research Design

A cross-sectional quantitative research design was adopted to examine the factors influencing older adults' awareness and utilization of healthcare applications and their effect on quality of life. This design was considered appropriate for capturing the distribution of the study variables at a single point in time and for testing the hypothesized relationships between them.

Population and Sample

The target population comprised Saudi adults aged 30 years and above residing in Jeddah City. Based on recent census data, the total population of Jeddah was approximately 3.75 million, of whom 58.4% were Saudi nationals, with around 37% aged 30 years or older, resulting in an estimated population of 810,000 individuals. Using an online sample size calculator at a 95% confidence level and a 5% margin of error, the required sample size was estimated at 384 respondents.

A stratified random sampling technique was employed to ensure representation across age groups (30–39, 40–49, 50–59, and 60 years and above), gender (male and female), and education level (secondary, diploma, bachelor, and postgraduate). A total of 316 electronic questionnaires were distributed, of which 227 were returned, yielding a response rate of 71.8%. After screening, 66 questionnaires were excluded due to incompleteness, extreme gender imbalance, or respondents being under the age of 30, leaving 161 valid responses (70.9% of returned) for analysis.

Study Tool

Data were collected using a structured self-administered questionnaire developed in the Arabic language and organized into four main sections. Section A captured demographic and background information, including age, gender, educational level, occupation, income, type of device used, and internet access. Section B measured awareness and utilization of healthcare applications, with specific reference to Sehaty and Wasfaty. Section C comprised items measuring the six independent variables on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Section D assessed quality of life across physical, emotional, and social well-being dimensions.

The questionnaire drew upon previously validated instruments, including the Digital Health Literacy Instrument (DHLI) developed by van der Vaart and Drossaert (2017), the eHealth Literacy Scale (eHEALS) by Norman and Skinner (2006), and the Mobile Application Acceptance Questionnaire (MAAQ) as adapted by Jokisch *et al.,* (2024) and Fan *et al.,* (2024). Items were translated from English into Arabic using forward–backward translation to ensure conceptual equivalence.

Data Collection Procedures

Data collection was carried out in June 2025 through electronic distribution of the questionnaire. Participants received a brief introduction to the purpose of the study and completed the questionnaire voluntarily. Prior to the main study, a pilot test was conducted with 30 respondents to refine item wording, verify clarity, and

confirm acceptable internal consistency (Cronbach's alpha > 0.70 on all scales).

Validity and Reliability

Content validity was established through review by three academic experts in the fields of public health, health informatics, and research methodology, who evaluated the relevance, clarity, and comprehensiveness of the items. Construct validity was assessed through item-total correlations, all of which exceeded the recommended threshold. Reliability was examined using Cronbach's alpha coefficient, which ranged from 0.875 to 0.944 across the individual dimensions, with an overall coefficient of 0.889 for the 39 retained items, indicating a high level of internal consistency.

Ethical Considerations

Ethical approval was obtained from the relevant academic committee prior to data collection. All participants provided informed consent electronically before completing the questionnaire, and they were informed of their right to withdraw at any point without consequence. Anonymity and confidentiality of responses were maintained throughout the data collection, storage, and analysis stages, and no personally identifiable information was recorded.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 26. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were computed to profile the sample and the study variables. Inferential analyses comprised chi-square tests of association, independent-samples t-tests, one-way ANOVA, Pearson and Spearman correlation coefficients, and multiple linear regression. The level of statistical significance was set at $p < 0.05$ for all analyses.

RESULTS

A total of 161 valid responses were analyzed. As shown in Table 1, the sample was predominantly female (74.5%) compared with male respondents (25.5%). The majority of participants (60.9%) were aged between 30 and 40 years, held a bachelor's degree (62.7%), and were married (81.4%).

Chi-square analyses demonstrated that awareness and utilization of healthcare applications were significantly associated with gender, job title, age, education, occupation, and marital status (all $p < 0.001$). In contrast, years of experience were not significantly associated with awareness ($\chi^2 = 8.66$, $p = 0.070$).

Descriptive statistics for the six independent variables, as presented in Table 2, revealed that perceived benefit obtained the highest mean score ($M = 3.83$, $SD = 0.70$), followed by health and ageing issues ($M = 3.76$, $SD = 0.81$) and perceived ease of use ($M = 3.72$, $SD = 0.63$). Lower mean scores were recorded for lack of digital literacy ($M = 2.98$, $SD = 0.97$), fear of making mistakes ($M = 2.56$, $SD = 0.97$), and lack of internet and devices ($M = 1.68$, $SD = 0.74$), indicating that infrastructural access barriers were the least salient in the present sample.

Chi-square tests for the key dimensions confirmed significant associations with awareness and utilization, including health and ageing issues ($\chi^2 = 44.291$, $p < 0.001$), perceived ease of use ($\chi^2 = 53.491$, $p < 0.001$), and perceived benefit ($\chi^2 = 57.919$, $p < 0.001$).

Correlation analyses (Table 3) showed that awareness and utilization were positively and strongly correlated with perceived benefit ($r = 0.815$, $p < 0.01$), perceived ease of use ($r = 0.673$, $p < 0.01$), and health and ageing issues ($r = 0.675$, $p < 0.01$). Weak but statistically significant negative correlations were observed with lack of internet and devices ($r = -0.181$, $p < 0.05$) and fear of making mistakes ($r = -0.198$, $p < 0.05$). The correlation with lack of digital literacy did not reach statistical significance ($r = -0.131$, $p = 0.097$).

Multiple linear regression was conducted to identify the strongest predictors of awareness and utilization (Table 4). The overall model was statistically significant and explained 72.7% of the variance in the dependent variable, $R^2 = 0.727$, $F(6, 156) = 69.26$, $p < 0.001$. Perceived benefit emerged as the strongest predictor ($\beta = 0.606$, $p < 0.001$), followed by perceived ease of use ($\beta = 0.193$, $p = 0.002$) and health and ageing issues ($\beta = 0.146$, $p = 0.013$). The remaining three predictors—lack of digital literacy, lack of internet and devices, and fear of making mistakes—did not reach statistical significance.

Hypothesis testing based on the regression results indicated that H3 (health and ageing issues), H5 (perceived ease of use), and H6 (perceived benefit) were supported, whereas H1 (lack of digital literacy), H2 (lack of internet and devices), and H4 (fear of making mistakes) were not supported.

DISCUSSION

The present study examined the factors influencing older adults' awareness and utilization of healthcare applications in Jeddah City and the perceived effect of these applications on quality of life. The findings highlight perceived benefit as the primary driver of awareness and utilization, which is consistent with the perceived usefulness construct in the Technology Acceptance Model (TAM) and with prior evidence reported by Almulhem (2023) and Kim *et al.,* (2024). When individuals clearly recognize how an application can improve their health management, they are more likely to adopt it, regardless of their age.

Perceived ease of use also emerged as a significant predictor, confirming the importance of user-friendly design for older adults. This result aligns with

the findings of Alodhialah *et al.,* (2024) and Bertolazzi *et al.,* (2024), who reported that intuitive interfaces, simplified navigation, and minimal cognitive load can substantially enhance digital health adoption among ageing populations.

Health and ageing issues appeared to play a dual role, acting simultaneously as a motivation for adopting healthcare applications and as a potential barrier when chronic conditions limit the individual's ability to interact with digital tools. This nuanced dynamic is in line with Alharthi (2025) and Alzghaibi (2025), who underlined that perceived health needs can drive engagement with mHealth solutions, particularly for appointment management, prescription refills, and monitoring.

Interestingly, lack of digital literacy was not a statistically significant predictor in the multivariate model. A plausible explanation is that the present sample was relatively well educated, with 62.7% holding a bachelor's degree, and was concentrated in the 30–40 age group within an urban context characterized by high smartphone penetration. Similarly, access barriers related to internet and devices were weak, consistent with the advanced digital infrastructure in Jeddah City. Fear of making mistakes was also a weak predictor, possibly because modern applications increasingly incorporate design features that minimize error and enable easy recovery.

Overall, these findings reinforce a Saudi-specific evidence base indicating that psychological and perceptual determinants have begun to outweigh infrastructural constraints in shaping digital health adoption among adults aged 30 years and above in urban settings, echoing the conclusions of Alanezi (2020), Klaver *et al.,* (2021), and the recent national-level analyses by Alharthi (2025) and Alzghaibi (2025).

CONCLUSIONS

The study concluded that perceived benefit and perceived ease of use are the primary drivers of older adults' awareness and utilization of healthcare applications in Jeddah City, followed by health and ageing issues. In contrast, traditional access-related barriers such as lack of digital literacy, limited internet and devices, and fear of making mistakes exerted weaker and largely non-significant effects. These results suggest that, in urban Saudi contexts, digital health adoption is increasingly shaped by how useful and usable the applications are perceived to be, rather than by basic access constraints.

Implications and Recommendations

Based on the findings, several recommendations are offered. First, developers of healthcare applications should prioritize user-centered design, with a particular emphasis on simplicity, readability, and accessibility for older adults. Second, targeted digital literacy workshops should be organized through community centres and primary healthcare settings to consolidate basic skills and confidence. Third, caregivers and family members should be actively involved in supporting older adults' engagement with healthcare applications. Fourth, healthcare providers—particularly physicians and pharmacists—should explicitly endorse the use of platforms such as Sehaty and Wasfaty during clinical encounters. Fifth, policymakers within the framework of Vision 2030 should continue investing in public awareness campaigns and ensure that digital services are inclusive of all age groups. Finally, psychological barriers, including fear and mistrust of digital technologies, should be proactively addressed through reassurance-oriented communication and improved in-app guidance.

Study Limitations

Several limitations should be acknowledged. First, the cross-sectional design precludes inferences about causality between the independent variables and awareness and utilization of healthcare applications. Second, data were collected in a single city (Jeddah), which limits the generalizability of the findings to other regions of Saudi Arabia. Third, reliance on self-reported data introduces the possibility of social desirability and recall biases. Fourth, the study focused on six determinants, and additional variables—such as cultural beliefs, trust in institutions, and social support—were not examined. Fifth, the quantitative-only approach limited the depth of understanding that qualitative methods could provide. Finally, the sample was skewed toward the 30–40 age group, which should be taken into account when extending the results to much older populations.

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