

Types, Pattern And User Satisfaction Regarding Mobile Health Applications Among The General Population In Saudi Arabia: A Cross-Sectional Study

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Abstract

Mobile health (mHealth) applications are emerging as essential tools for promoting health awareness, self-management, and access to healthcare services. In Saudi Arabia, widespread smartphone adoption and government-supported digital health initiatives have facilitated the use of applications such as Seha, Mawid, Tawakkalna, Tabaud, and Tetamman. However, despite the growing prevalence of such applications, few studies have examined the related usage patterns, user satisfaction, and demographic influences among the general population. To address this gap in the literature, this study sought to examine the types, patterns, and levels of satisfaction associated with mHealth application use in Saudi Arabia. A cross-sectional design was employed, with 375 adult smartphone users recruited via convenience sampling. Data were collected via a self-administered online questionnaire assessing sociodemographic factors, application types, and usage patterns, while user satisfaction was measured on a 12-item Likert scale. The results indicated that general health (52.3%) and fitness (38.7%) applications were most commonly used, with monthly, daily, and weekly engagement reported most frequently. Overall satisfaction with these applications was high (mean = 48.76, standard deviation = 7.20), particularly regarding the usability and acceptability. Yet satisfaction differed significantly by gender, monthly income, and frequency of use, whereas age, education, and nationality had no significant effects. These findings highlight the importance of user-friendly design, clear instructions, and privacy protections to promote sustained engagement in terms of mHealth applications. This underscores the need for tailored strategies to enhance mHealth adoption, optimize the user experience, and support equitable and effective digital health delivery in Saudi Arabia.

Keywords: Type of mobile health applications, mHealth application, User satisfaction, Usage patterns, Saudi Arabia.

Introduction

Mobile health (mHealth) applications are emerging as critical tools for promoting health awareness, self-management, and access to healthcare services worldwide. Indeed, millions of people are increasingly relying on these digital platforms to monitor their health, access medical information, and manage chronic conditions, indicating a transformative shift in healthcare delivery (Alshehri et al., 2021). This trend can also be seen in Saudi Arabia, where it has been amplified by the rapid proliferation of smartphones and the government's commitment to digital health transformation, leading to widespread adoption of applications such as Seha, Mawid, Tawakkalna, Tabaud, and Tetamman (Alghamdi et al., 2022). These applications have become instrumental in bridging gaps in terms of healthcare accessibility, enhancing patient monitoring, and supporting clinical decision-making. The high penetration of smartphones in Saudi Arabia—where over 22 million users were reported in 2021 (Alshahrani et al., 2021)—has fostered an environment conducive to the growth of mHealth applications. In fact, studies suggest that approximately

75% of smartphone users in Saudi Arabia have downloaded at least one health-related application, which emphasizes the central role these platforms play in individual health management and well-being (Alshahrani et al., 2021). This surge in adoption aligns with broader national efforts to address the healthcare challenges posed by a rapidly growing population, the high prevalence of non-communicable diseases, and ongoing reforms aimed at modernizing the Saudi healthcare system (Amer et al., 2022).

However, despite the evident growth and potential of mHealth applications, there remains a significant gap in the literature regarding the related usage patterns and user experiences among the general population in Saudi Arabia. While previous studies have explored the benefits of these applications for self-management of chronic diseases, such as diabetes, hypertension, and cardiovascular conditions, highlighting improved disease control, complication reduction, and enhanced patient outcomes (Faraj, 2024; Mahmood et al., 2019), there is limited evidence concerning how the broader population engages with such tools. As prior research has primarily targeted specific subpopulations, including patients with chronic diseases (Alharbi et al., 2021), healthcare professionals (Alghamdi et al., 2022), and university students (Al-Hamour et al., 2020), understanding of the patterns of engagement, types of applications preferred, and levels of satisfaction among the general population remains limited in the Saudi context.

mHealth applications provide a multitude of functionalities beyond mere health tracking, offering features such as disease management, telemedicine services, medication reminders, health education, and vital sign monitoring, enabling users to actively participate in managing their health (Choi et al., 2021; Roslan et al., 2021; Villasana et al., 2019). Moreover, by integrating mobile computing with medical sensing and communication technologies, mHealth applications facilitate a comprehensive approach to health service delivery, combining real-time information with actionable health insights (Pires et al., 2020). This integration of technology into everyday health practices is especially relevant in Saudi Arabia, where public health initiatives are increasingly leveraging digital solutions to enhance healthcare access, patient engagement, and the healthcare system's overall efficiency.

Users' acceptance and satisfaction are critical determinants of the effectiveness and sustainability of mHealth applications. In this context, user satisfaction reflects positive perceptions and acceptance, which are influenced by an application's design, usability, functionality, and alignment with the user's needs (Wang & Wu, 2021). High levels of satisfaction encourage continued engagement, maximize the utility of the relevant digital tool, and contribute to improved health behaviors and outcomes (Villasana et al., 2019). Yet, despite the demonstrated benefits, the factors that shape user satisfaction and drive sustained usage in terms of mHealth applications remain insufficiently understood in the Saudi context. Still, systematic reviews of randomized controlled trials have reported significant enhancements in health behaviors and clinical outcomes among mHealth application users, reinforcing the need for more nuanced studies to examine the usage patterns, satisfaction determinants, and impacts on health outcomes (Han & Lee, 2018). In addition to the individual health benefits, the integration of mHealth applications into national healthcare strategies has broader implications for both public health and policy development. By assessing usage patterns and satisfaction levels, stakeholders (e.g., policymakers, healthcare providers, application developers) can gain actionable insights into the design and implementation of more effective digital health interventions. Determining which types of applications are most frequently used, how users interact with different features, and which specific elements drive satisfaction can guide the optimization of these platforms to better meet population needs. Such evidence is crucial for developing targeted strategies that enhance user engagement, improve adherence to health recommendations, and ultimately, contribute to more efficient and equitable healthcare delivery in Saudi Arabia.

This study, therefore, seeks to address the above-mentioned knowledge gaps by examining the types, patterns, and satisfaction levels associated with mHealth application usage among the general Saudi population. It focuses on identifying the most commonly used applications, exploring usage patterns, measuring user satisfaction, and analyzing variations based on sociodemographic characteristics and frequency of use. In this way, this study aims to provide comprehensive evidence that can inform future research, digital health policy, and practical strategies to optimize the effectiveness of mHealth technologies. Hence, it seeks to underscore the transformative potential of digital health tools when it comes

to enhancing healthcare delivery, patient empowerment, and population-level health outcomes in Saudi Arabia.

Furthermore, this study examines how different user groups interact with mHealth applications and the extent to which such interactions influence user satisfaction and engagement. Concepts such as the “pattern of use” and “user satisfaction” are central to understanding the dynamics of mHealth application adoption. Here, the pattern of use encompasses the frequency, intensity, and nature of a user’s interactions with various application features, reflecting both user acceptance and perceived usability (Wang & Wu, 2021). In turn, user satisfaction captures the degree to which an application meets the user’s functional requirements, provides intuitive interfaces, and aligns with the user’s expectations, thereby shaping sustained engagement (Villasana et al., 2019). By exploring these dimensions, this study provides a holistic perspective on mHealth application utilization, emphasizing both behavioral and experiential aspects.

The significance of this research extends beyond academic inquiry. By elucidating the associations between usage patterns, satisfaction levels, and sociodemographic factors, the findings offer practical guidance for enhancing the design and delivery of mHealth applications. Policymakers can leverage such evidence to implement initiatives that promote wider adoption of and engagement with mHealth applications, healthcare providers can tailor interventions to specific population needs, and developers can optimize application features to enhance the user experience. Ultimately, this study contributes to improving community health outcomes, fostering a culture of proactive health management, and supporting the broader objectives of the digital health transformation in Saudi Arabia. In particular, it highlights opportunities for both nurses and healthcare educators to actively participate in health education initiatives, using mHealth applications as tools to extend their reach and impact in the community.

Through a comprehensive examination, this study seeks to provide insights that bridge the current gap between technology availability and actual user engagement. To accomplish this, it establishes a framework for understanding how mHealth applications function within the Saudi healthcare landscape, offering empirical evidence regarding their effectiveness, usage patterns, and user satisfaction. By synthesizing these insights, the present research lays the groundwork for future studies and policy interventions aimed at maximizing the benefits of digital health tools, promoting equitable healthcare access, and enhancing the overall quality of healthcare delivery.

Literature Review

mHealth applications have become a central component of contemporary healthcare delivery, providing users with a range of tools to manage health, improve disease control, and promote wellness behaviors. Globally, these applications are recognized for their capacity to support health-related self-management, facilitate medication adherence, and enhance physical activity, thereby driving tangible improvements in health outcomes (Free et al., 2013). In Saudi Arabia, the Ministry of Health has developed numerous mHealth applications and made them available for public use, including Sehhaty, Tawakkalna, Tabaud, Seha, Mawid, and Tetamman (AlAli et al., 2023). Among these applications, Tawakkalna, which was launched in 2020 as a COVID-19 contact-tracing application, has received mixed usability ratings for its pandemic-related features (Alghareeb et al., 2023). The widespread availability and use of mHealth applications reflect the growing digital health infrastructure in Saudi Arabia, although research on specific patterns of application adoption, usage behaviors, and user satisfaction levels remains limited.

Approximately 75% of smartphone users in Saudi Arabia have installed at least one health-related application, indicating a significant increase in mHealth application adoption across the country (Alghamdi et al., 2022). Yet, despite this substantial uptake, empirical studies that explore which applications are most commonly used, how they are utilized, and the resulting health outcomes are scarce. The available evidence suggests that fitness and nutrition applications are the most popular among Saudi users, followed by applications designed to facilitate medication tracking and chronic disease management (Alnasser et al., 2018). This pattern indicates population-level interest in preventive healthcare and lifestyle management, reflecting broader global trends in health application utilization. Studies have also shown that individuals who frequently engaged with mHealth applications during 2019 reported higher levels of physical activity and better adherence to prescribed medications, suggesting a positive association between application usage

intensity and health-promoting behaviors (Alshammari et al., 2019). However, contradictory findings from a 2021 study indicated there to be no significant relation between application usage patterns and health outcomes, underscoring the need for further investigations into how and to what extent engagement with these tools translates into measurable health benefits (Alshahrani et al., 2021).

Understanding the factors that influence mHealth application adoption is critical to developing effective strategies to increase engagement with such applications. Research suggests that adoption in this context is shaped by a combination of demographic characteristics, health status, and technological literacy. Younger female users, for instance, demonstrate higher engagement with mHealth applications, while individuals with an advanced education level and good overall health tend to use such applications more consistently (Alfadhli et al., 2020; Alotaibi et al., 2018). These findings highlight the importance of tailoring digital health strategies to specific demographic groups to maximize their reach and effectiveness. Moreover, users' perceptions of an application's usability, usefulness, trustworthiness, and information quality play a pivotal role in their adoption decisions. Bamufleh et al. (2021) found that Saudi Arabian citizens adopt e-government health applications when they perceive the tools to be easy to use, reliable, socially endorsed, and supported by facilitating conditions. Trust is particularly significant in this regard, as users are more likely to engage with applications that will safeguard their private information while delivering practical and actionable health services (Almazroi et al., 2022).

Applications that target patients with chronic conditions, such as diabetes or cardiovascular diseases, are especially likely to be in high demand, particularly among older adults and individuals with lower levels of formal education, who may require additional support with disease management (Alharbi et al., 2021). These insights underscore the role of both demographic and contextual factors in shaping mHealth application adoption, and they also highlight the necessity of designing inclusive digital health solutions that cater to diverse population needs. However, despite the increasing adoption rates, there remains a lack of comprehensive knowledge regarding how Saudi users interact with mHealth applications across different age groups, educational backgrounds, and health conditions. This knowledge gap has implications for policy development, user engagement strategies, and the design of applications that meet the specific needs of the Saudi population.

In addition to better understanding usage patterns, evaluating user satisfaction is crucial when assessing the effectiveness and sustainability of mHealth applications. Indeed, user satisfaction not only reflects the perceived quality and utility of such applications but also serves as a predictor of continued engagement and adherence to health-promoting behaviors. Studies conducted in Saudi Arabia have provided valuable insights into the factors that influence user satisfaction. For example, Ansari et al. (2022) conducted a cross-sectional study using the Technology Acceptance Model and the Mobile Application Rating Scale to assess people's perceptions of applications intended to promote physical activity. Their findings elucidate the key determinants of satisfaction, including perceived usability, functionality, and alignment with user needs. Similarly, Alharbi et al. (2021) examined users' satisfaction with the Seha e-health application during the post-COVID-19 period, revealing how users' perceptions evolved over time and in response to changing healthcare contexts. AlOtaibi et al. (2021) further explored users' satisfaction with the Wateen application, highlighting the importance of understanding user experiences in relation to the design and continuous improvement of digital health platforms.

Recent studies have emphasized the mediating role of e-satisfaction in ongoing application use. For instance, Wu et al. (2022) demonstrated that satisfaction functions as a key driver of continued use, encouraging users to continue engaging with mHealth systems, while Nuo et al. (2023) identified specific elements that determine users' satisfaction with sleep-related health applications. These findings suggest that understanding satisfaction-related factors is essential not only for evaluating current application performance but also for informing the development of future interventions that enhance the user experience and health outcomes. By examining the determinants of both satisfaction and ongoing engagement, researchers can identify strategies to increase adoption, improve adherence to health recommendations, and ultimately, promote better population-level health outcomes.

Overall, the reviewed literature indicates that mHealth applications provide substantial benefits for users by facilitating better disease management, promoting healthy behaviors, and supporting medication

adherence. Patterns of application usage are influenced by demographic variables, health conditions, technological literacy, and perceived usability, while satisfaction is shaped by factors such as functionality, information quality, trust, and ease of use. The identified barriers to adoption, including institutional practices, ethical concerns, and social influences, further affect user engagement and must be considered when designing strategies to promote digital health interventions in Saudi Arabia. Yet, despite these insights, significant gaps remain in understanding how the general Saudi population interacts with mHealth applications, which types of applications are preferred, and how satisfaction varies across user groups. This study aims to fill the above-mentioned gaps by performing an in-depth examination of mHealth application types, usage patterns, and user satisfaction levels among Saudi citizens. By synthesizing the existing knowledge and identifying factors that drive both engagement and satisfaction, this study will offer valuable guidance for healthcare providers, policymakers, and developers seeking to optimize the design, implementation, and evaluation of digital health tools. Better understanding the key dynamics in this regard will inform strategies to increase user engagement, enhance health outcomes, and support the broader digital transformation of healthcare in Saudi Arabia, helping align technology adoption with national health priorities and population needs.

Methodology

Research Design

A cross-sectional design was employed to examine the types, patterns of use, and user satisfaction levels regarding mHealth applications among the general population in Saudi Arabia. The chosen design enabled data collection at a single point in time, providing a snapshot of current usage behaviors and satisfaction levels.

Study Participants and Sample

The target population comprised adults who reside in Saudi Arabia. Convenience sampling was employed to recruit eligible participants during the data collection period. The sample size was calculated using Raosoft software based on an estimated national population of approximately 35 million, with a 95% confidence level, 5% margin of error, and 50% response distribution, resulting in a required sample of 385 participants. A total of 375 participants completed the questionnaire. The inclusion criteria included adults aged 18 years or older, ownership of a smartphone, and use of at least one mHealth application within the previous six months. Individuals who were unable to comprehend the survey language or required assistance to complete the questionnaire were excluded from the study.

Setting

Data were collected across different regions of Saudi Arabia. The online questionnaire approach facilitated access to diverse demographic groups and reflected the widespread use of smartphones and internet services in both urban and rural areas.

Instrument

A self-administered questionnaire consisting of three sections was used in this study. The first section collected sociodemographic data, including respondents' age, gender, marital status, educational level, nationality, occupation, monthly income, and region of residence. The second section, which was adapted from Alrasheedy et al. (2021), assessed respondents' types and patterns of mHealth application use. The third section measured respondents' satisfaction with the utilized mHealth applications using a 12-item scale adapted from Melin et al. (2020), which was rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Items 5, 6, and 7 were reverse-coded. The total satisfaction scores ranged from 12 to 60, with higher scores indicating greater user satisfaction. The reliability of the revised scale was previously established based on the Person Separation Index of 0.78 (Melin et al., 2020).

Data Collection and Analysis

Data were collected using an online survey that was distributed via Google Forms to maximize the reach and cost efficiency. All the statistical analyses were conducted using SPSS version 26. The descriptive statistics included frequencies and percentages for categorical variables and means with standard deviations for continuous variables. Independent samples t-tests were performed to compare the mean satisfaction scores across dichotomous variables such as gender, nationality, and employment status. A one-way analysis of variance (ANOVA) was used to examine the differences in the satisfaction scores across sociodemographic characteristics and frequencies of mHealth application use. Statistical significance was established at $p < .05$.

Ethical Considerations

Ethical approval to conduct this study was obtained from Fakeeh College for Medical Sciences prior to the data collection. Participants were informed about the study's objectives, procedures, and potential risks and benefits, as well as about their right to withdraw at any time without consequences. Electronic informed consent was obtained from all respondents before they completed the questionnaire.

Results

The findings reported in this section are based on the final analytic sample of 375 respondents and are presented according to the study objectives—namely, sociodemographic characteristics, types and patterns of mHealth application use, overall user satisfaction, and differences in satisfaction levels across demographic and usage variables.

Sociodemographic Characteristics

The respondents were predominantly female (83.5%) and aged 30–39 years (39.7%). More than half were married (52.0%), and the majority held a bachelor's degree (53.3%). Most respondents were Saudi nationals (88.0%) and employed (77.9%). Regarding their monthly income, 31.7% reported earning SAR 10,000–15,000. The sample was largely concentrated in the Western region (89.3%). Detailed characteristics of the respondents are presented in Table 1.

Table 1. Participant Sociodemographic Characteristics (N = 375)

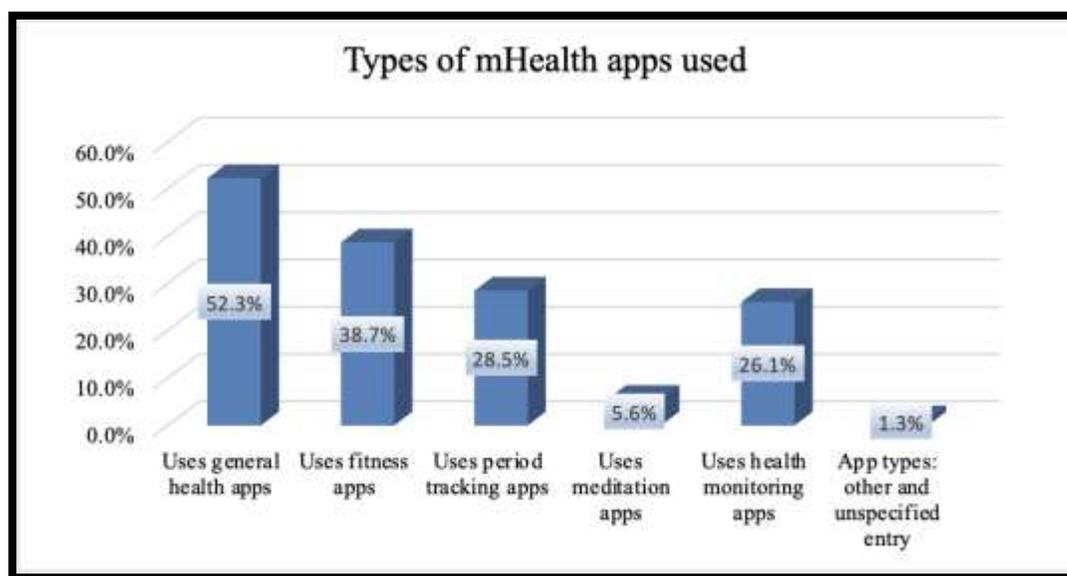
Characteristic	Category	n	%
Gender	Male	62	16.5 %
	Female	313	83.5 %
Age group	18–29 years	99	26.4 %
	30–39 years	149	39.7 %
	40–49 years	76	20.3 %
	≥50 years	51	13.6 %
Marital status	Single	133	35.5 %
	Married	195	52.0 %
	Divorced	33	8.8 %
	Widow(er)	14	3.7 %
Highest education	Pre-university	38	10.1 %
	Diploma	42	11.2 %
	Bachelor	200	53.3 %
	Master	74	19.7 %
	PhD	16	4.3 %
Nationality	Professional degree	5	1.3 %
	Saudi	330	88.0 %
	Non-Saudi	45	12.0 %

Employment status	Employed	292	77.9 %
	Unemployed	83	22.1 %
Monthly income (SAR)	< 5,000	95	25.3 %
	5,000–10,000	98	26.1 %
	10,000–15,000	119	31.7 %
	> 15,000	63	16.8 %
Region of residence	Central	7	1.9 %
	Western	335	89.3 %
	Eastern	22	5.9 %
	Northern	7	1.9 %
	Southern	4	1.1 %

Types of mHealth Applications Used

More than half of respondents reported using general health applications (52.3%). Fitness applications were also commonly used (38.7%), followed by period-tracking (28.5%) and health-monitoring (26.1%) applications. Meditation applications were the least frequently used (5.6%) (Figure 1). Multiple response options were permitted when answering this question.

Figure 1. Types of Mhealth Applications Used (Multiple Responses Permitted)



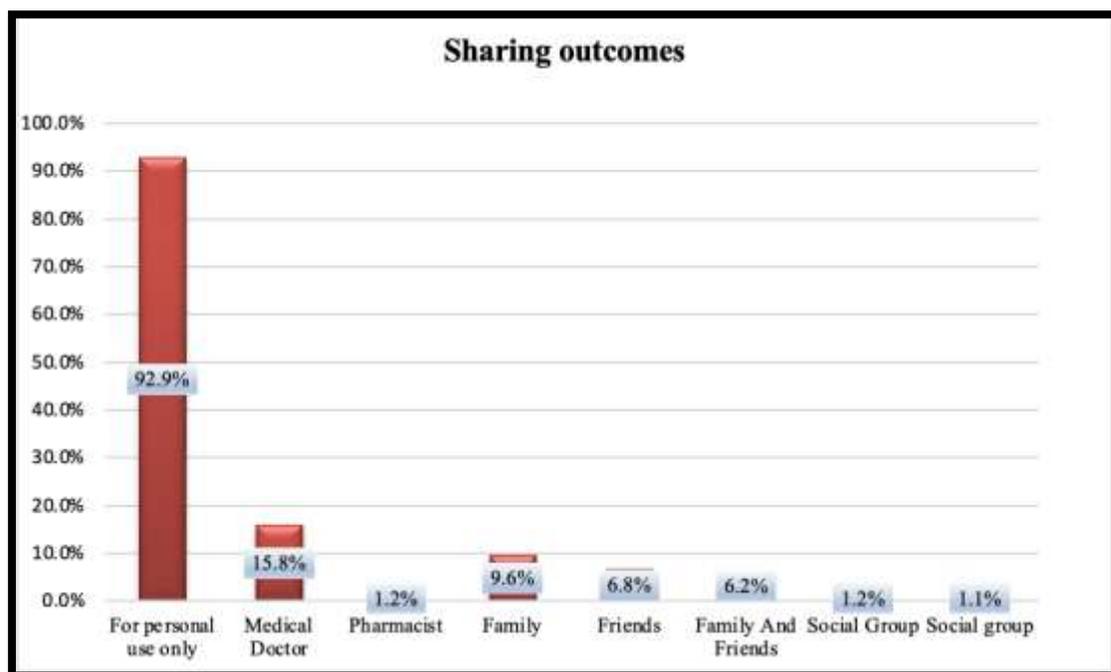
Patterns of mHealth Application Use

Monthly use was the pattern most frequently reported by respondents (27.2%), followed by daily use (23.2%) and weekly use (23.2%). Less frequent use included twice a month (10.7%) and twice a week (8.8%). A small proportion of respondents failed to respond to this question or provided unclear responses. Regarding the sharing of outcomes, the majority of respondents indicated that the mHealth applications were used for personal purposes only (90.9%). Sharing outcomes with a medical doctor was reported by only 15.8% of respondents (Table 2 and Figure 2).

Table 2. Patterns of Mhealth App Use: Frequency of Use and Sharing Outcomes

Frequency category	n	%
Daily	87	23.2%
Twice a week	33	8.8%
Weekly	87	23.2%
Twice a month	40	10.7%
Monthly	102	27.2%
Not available	18	4.8%
Other/unclear entry (“Option 7”)	8	2.1%

Figure 2. Sharing Outcomes (Multiple Responses Permitted)



User Satisfaction With mHealth Applications

The respondents' overall satisfaction levels were high. Positive usability perceptions were prominent, including “easy to use” (mean [M] = 4.44, standard deviation [SD] = 0.83) and “good to use” (M = 4.43, SD = 0.85). Items reflecting a potential burden had relatively low raw M scores, such as “too time-consuming” (M = 2.84, SD = 1.36), “boring to use” (M = 2.41, SD = 1.21), and “disturbance” (M = 2.19, SD = 1.22). The M overall satisfaction score was 48.76 (SD = 7.20), with an observed range of 25–60. The “What did you think?” subscale (items 1–8, with items 5–7 reverse-coded) yielded an M of 32.32 (SD = 4.65), while the “Experience” subscale (items 9–12) yielded an M of 16.44 (SD = 3.83). Detailed item-level results are presented in Table 3.

Table 3. User Satisfaction With mHealth Applications (N = 375)

Item (abbreviated)	M	SD
1. Easy to use	4.44	0.83
2. Good to use	4.43	0.85

3. Time acceptable	4.34	0.86
4. Instructions sufficient	4.27	0.95
5. Too time consuming (R)	2.84	1.36
6. Boring to use (R)	2.41	1.21
7. Disturbance (R)	2.19	1.22
8. Recommend to others	4.27	0.92
9. Motivated lifestyle change	4.02	1.13
10. Understood benefits	4.15	1.01
11. Understood need to change	4.15	1.03
12. Helped set goals	4.11	1.05
Overall satisfaction	48.76	7.20

Differences in Satisfaction Scores Across Demographic and Usage Variables

A statistically significant difference in overall satisfaction was observed between the genders, with male respondents reporting higher satisfaction ($M = 50.85$, $SD = 6.21$) than females ($M = 48.35$, $SD = 7.31$), $t(373) = 2.53$, $p = .012$. Monthly income was also significantly associated with overall satisfaction, $F(3, 371) = 3.736$, $p = .011$. Here, respondents earning SAR 10,000–15,000 reported the highest satisfaction levels ($M = 49.97$, $SD = 6.45$), whereas those earning more than SAR 15,000 reported comparatively lower scores ($M = 46.35$, $SD = 7.55$). No statistically significant differences were identified across the age group, marital status, educational level, nationality, employment status, or region of residence variables ($p > .05$). The frequency of mHealth application use was strongly associated with the reported satisfaction level, $F(6, 368) = 9.138$, $p < .001$. Respondents who used applications daily ($M = 50.78$, $SD = 6.39$) or weekly ($M = 50.82$, $SD = 6.43$) reported significantly higher satisfaction when compared with the less frequent users. Detailed results of the comparative analyses are presented in Table 4.

Table 4. Differences In Satisfaction Scores Across Demographic and Usage Variables

Variable	Group	N	Mean	SD	F or t-test	p-value
Gender	Male	62	50.85	6.21	2.53	.012*
	Female	313	48.35	7.31		
Age Group	18–29 years	99	48.84	7.44	0.108	.955
	30–39 years	149	48.94	7.06		
	40–49 years	76	48.38	7.26		
	≥50 years	51	48.65	7.19		
Marital Status	Single	133	48.02	7.44	1.456	.226
	Married	195	49.25	7.28		
	Divorced	33	47.85	6.11		
	Widow	14	51.14	5.22		
Education Level	Pre-university	38	51.05	7.22	1.521	.182
	Diploma	42	48.07	8.14		
	Bachelor	200	48.37	7.04		
	Master	74	48.46	7.00		
	PhD	16	51.63	7.69		

	Professional	5	48.00	0.71		
Nationality	Saudi	330	48.91	7.15	1.09	.278
	Non-Saudi	45	47.67	7.54		
Employment Status	Employed	292	48.98	6.99	1.13	.261
	Unemployed	83	47.98	7.88		
Monthly Income (SAR)	< 5000	95	49.17	7.06	3.736	.011*
	5000–10000	98	48.44	7.64		
	10000–15000	119	49.97	6.45		
	> 15000	63	46.35	7.55		
Region of Residence	Central Region	7	50.29	6.65	2.223	.066
	Western Region	335	48.55	7.24		
	Eastern Region	22	52.77	6.27		
	Northern Region	7	46.43	6.19		
	Southern Region	4	46.00	5.35		
Frequency of Usage	Daily	87	50.78	6.39	9.138	<.001*
	Twice a week	33	50.48	5.25		
	Weekly	87	50.82	6.43		
	Twice a month	40	47.30	6.83		
	Monthly	102	47.12	7.49		
	Not available	18	41.78	5.77		
	Other (Option 7)	8	41.25	11.09		

Discussion

The present study examined the use of mHealth applications and the associated user satisfaction among the general population of Saudi Arabia. In this section, the findings are discussed in relation to the types and patterns of use, satisfaction levels, and influencing factors, contextualized with prior research findings.

Types and Patterns of mHealth Application Use

General health applications were the most commonly used category (52.3%), followed by fitness (38.7%), period-tracking (28.5%), and health-monitoring applications (26.1%), while meditation applications were the least commonly utilized (5.6%). These findings suggest a preference for multipurpose tools that support lifestyle tracking and self-management of health. Comparable evidence from prior studies conducted in Saudi Arabia indicates widespread use of step-counting applications (54.2%) and ovulation/period-tracking apps among women (43.5%) (Amer et al., 2022). Government-affiliated platforms such as Tawakkalna remain prominent, with 48% of users engaging with such applications (Aldhahir et al., 2022).

The usage intensity in the current study was moderate, with monthly use being the most common (27.2%), followed by daily (23.2%) and weekly use (23.2%). These patterns are consistent with international observations, where general health and fitness applications dominate usage, although engagement is distributed across different frequencies (Kc et al., 2021; Paradis et al., 2022). The rate of sharing outcomes with healthcare providers was limited in this study, with most users keeping data to themselves (92.9%) and only 15.6% sharing data with a medical professional. This contrasts with the prevalence of teleconsultation-focused applications in Saudi Arabia, reflecting the predominance of self-directed applications and persistent privacy and trust concerns (Alhammad et al., 2024; Sangers et al., 2021).

User Satisfaction

The overall satisfaction with mHealth applications was high in this study, particularly in terms of usability items such as “easy to use” (M = 4.44, SD = 0.83) and “good to use” (M = 4.43, SD = 0.85), while negative items received low scores, indicating a low perceived burden. The total satisfaction score (M = 48.76, SD = 7.20) reflects generally favorable experiences. The high usability and clear instructions likely contributed

to users' sustained engagement, which is consistent with the findings of prior Saudi studies concerning the Seha and Sehhaty applications, where high perceived ease of use and willingness to recommend were reported (Aldhahir et al., 2022; Alshammari et al., 2025).

User satisfaction operates as a mediating factor between application features and engagement, with e-satisfaction linking perceived reliability to continued use (Wang et al., 2021; Wu et al., 2022). Basic application features positively affect satisfaction, whereas value-added features may produce mixed effects due to cost or complexity considerations (Wang et al., 2022). These findings highlight the importance of user-centered design and reliable functionality when it comes to maintaining high satisfaction.

Factors Influencing Satisfaction

Significant differences in satisfaction were observed based on gender, monthly income, and frequency of application use. For instance, males reported higher satisfaction than females ($M = 50.85$ vs. 48.35 , $t = 2.53$, $p = .012$), aligning with previous findings regarding gender differences in application engagement in Saudi Arabia (Alanzi et al., 2022; Mahfouz et al., 2023). Monthly income was also associated with satisfaction, with highest scores noted among participants earning SAR 10,000–15,000 and lower satisfaction among those earning SAR >15,000, possibly due to higher expectations or privacy concerns among higher-income users (Alhammad et al., 2024).

The frequency of use was strongly associated with satisfaction ($p < .001$), with daily and weekly users reporting higher satisfaction than monthly or irregular users, which is consistent with prior evidence that satisfaction predicts ongoing engagement (Nie et al., 2023; Wang et al., 2021; Wu et al., 2022). Age, nationality, and employment status did not significantly influence satisfaction, although previous studies suggested that older adults may face usability barriers that affect adoption (Hepburn et al., 2025). These findings support the need for tailored mHealth strategies that are responsive to the requirements of user subgroups.

Strengths and Limitations

The strengths of the present study include the use of a cross-sectional design to capture current mHealth application usage, an adequately powered sample determined via Raosoft calculations, and validated instruments for assessing application types and satisfaction levels. However, the limitations include the reliance on convenience sampling, which may limit the generalizability of the findings, overrepresentation of females from the Western region of Saudi Arabia, potential recall and social desirability biases in self-reported measures, and inability to infer causal relationships due to the cross-sectional design.

Implications

The present findings highlight the importance of designing mHealth applications that optimize user satisfaction to promote continuous engagement. Hence, applications should be user-friendly, provide clear guidance, and support daily health management tasks. The limited sharing of health data with clinicians reported by respondents indicates the need for privacy protections and trust-building mechanisms to encourage secure interactions. Policymakers and developers should focus on strategies to increase usability, expand awareness among less active users, and ensure equitable access to digital health solutions across the Saudi population.

Recommendations for Future Research

Based on the findings of this study, it is recommended that developers prioritize intuitive and user-friendly designs that provide clear instructions, feedback mechanisms, and features that allow users to track their health goals and enjoy personalized experiences. Healthcare providers and the Ministry of Health should establish secure and voluntary workflows for sharing application outcomes during standard care while ensuring that users are informed about privacy protocols and data-handling procedures to foster trust. Public awareness campaigns should target groups with lower satisfaction levels, thereby promoting equitable access and encouraging consistent use of mHealth applications. Additionally, future studies should employ longitudinal or prospective cohort designs to examine the temporal relations between application

engagement and satisfaction, and they should utilize probability-based or stratified sampling to enhance the representativeness across Saudi regions. Qualitative investigations, such as interviews or focus group studies, would further elucidate the reasons behind the limited sharing of data with clinicians and identify specific feature expectations among subgroups with lower satisfaction, guiding the development of more effective, user-centered mHealth solutions.

Conclusion

This study has demonstrated that mHealth application use in Saudi Arabia is centered on general health and fitness functions, with most users engaging with applications at least monthly and for personal purposes. The overall user satisfaction was high, particularly regarding usability and acceptability. Yet satisfaction varied by gender and income, and it was strongly associated with the usage frequency, emphasizing the need for applications that are both intuitive and valuable to sustain regular engagement. These findings underscore the importance of optimizing the user experience, strengthening privacy-preserving features for clinical data sharing, and tailoring implementation strategies to diverse user subgroups to support both equitable and effective digital health delivery.

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Conflict of interest

The authors declare no conflict of interest in the preparation of this study.

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