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From Awareness to Behaviour Change: Determinants of Mobile Health App Utilisation in South-East Nigeria

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Abstract

Background: The global demand for accessible and affordable healthcare has accelerated the adoption of mobile health (mHealth) technologies. In Nigeria, while digital infrastructure is expanding, the transition from simple awareness of these tools to sustained health behaviour change remains a critical area of inquiry.

Objective: This study investigates the awareness, adoption patterns, and health-related motivations of mHealth app users in South-East Nigeria, and explores the technological and psychological determinants that drive proactive health management.

Methodology: Guided by the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and Protection Motivation Theory (PMT), the study employed a descriptive survey design. Data were collected from adult respondents across the five states of South-East Nigeria via a validated questionnaire. Descriptive statistics were utilised to analyse levels of awareness, primary motivations, and measurable behavioural outcomes.

Results: The findings indicate a high level of awareness regarding mHealth applications, coupled with moderately high adoption rates. Social validation and perceived usefulness were identified as significant drivers for peer recommendations. Motivations for adoption were primarily rooted in

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fitness, wellness, and health monitoring. Importantly, consistent engagement with mHealth apps led to improved health behaviour, specifically in adherence to medical instructions and proactive lifestyle adjustments. The results strongly support UTAUT2 constructs (performance expectancy, habit) and PMT constructs (coping appraisal, self-efficacy) as predictors of sustained use.

Conclusion: mHealth applications are emerging as vital tools for preventive health in South-East Nigeria. However, the efficacy of these tools is dependent on bridging the gap between technological exposure and long-term behavioural engagement.

Unique Contribution: This study provides an integrated theoretical perspective by combining UTAUT2 and PMT to explain mHealth adoption in a regional Nigerian context. It provides empirical evidence of how digital health tools serve as agents of self-managed care within a developing healthcare ecosystem.

Key Recommendation: Stakeholders should intensify digital health literacy programmes and integrate verified mHealth platforms into local health policies. Furthermore, developers should prioritise user-centred designs that cater to local health needs to ensure that high awareness translates into persistent, life-saving behavioural changes.

Keywords: mobile health (mHealth), digital health adoption, behaviour change, UTAUT2, PMT, South-East Nigeria.

Introduction

The global demand for accessible and affordable healthcare has intensified as populations increasingly prioritise healthy living. While high-income countries allocate significant portions of national budgets to healthcare, low- and middle-income countries face persistent challenges including inadequate infrastructure, unequal access to services, and rising costs (World Bank, 2022). These challenges are compounded by the growing burden of non-communicable diseases (NCDs) and ageing populations, which place unprecedented pressure on already strained health systems (WHO, 2023). As a result, the search for innovative and cost-effective health delivery models that bridge service gaps, improve monitoring, and empower individuals has accelerated.

Mobile health (mHealth) technologies have emerged as a viable response. Using smartphones, mobile internet, and cloud-based platforms, mHealth enables real-time diagnostic support, remote consultation, health education, personal tracking, and chronic disease management. Advances in artificial intelligence and big data analytics have further enhanced health apps, enabling personalised interventions, improving treatment adherence, and reducing the need for in-clinic visits, thereby lowering costs for both patients and providers (Simblett et al., 2021; Budd et al., 2020). Globally, over 350,000 health-related apps are available across major app stores, spanning fitness, nutrition, mental health, reproductive health, and condition-specific care (Statista, 2023).

In Nigeria, digital health adoption is growing, yet barriers such as limited broadband penetration, low digital literacy, and distrust in technology hinder widespread acceptance. Despite locally developed apps like Omomi, Hudibia, and Kangpe, indigenous solutions often see fewer

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downloads than foreign alternatives, suggesting gaps in awareness, perceived usefulness, and user experience. This is particularly concerning in South-East Nigeria, where healthcare delivery is constrained by poverty, inadequate infrastructure, and shortages of qualified personnel (Okaro et al., 2021). Mobile health solutions, therefore, present an opportunity to decentralise care and provide low-cost alternatives.

However, awareness alone does not guarantee adoption or sustained use. Behavioural science shows that uptake depends on perceived relative advantage, ease of use, trialability, social influence, and cultural compatibility (Hoque et al., 2017). In health apps, adoption is also a behavioural decision shaped by trust, privacy, relevance, and long-term value (Fischer et al., 2023). This study, therefore, investigates how mobile technology influences health decision-making among residents of South-East Nigeria, examining awareness, adoption, usage patterns, health needs driving engagement, and whether sustained use leads to improved health behaviours.

Objectives of the Study

The main aim of this study was to examine how mobile health apps have affected the health behaviours of the residents of South-East Nigeria. However, the specific objectives were to:

i. ascertain South-East residents' awareness of the mobile health apps and their functions;
ii. determine the extent to which South-East residents adopt and use mobile health apps;
iii. Identify the major health needs that lead South-East residents to adopt and use mobile health apps; and
iv. ascertain the extent to which South-East residents alter their health behaviour through the usage of mobile health apps.

Literature Review

Conceptual Overview of Mobile Health Applications

Mobile health (mHealth) refers to the use of mobile phones and wireless technologies to support medical and public health practices. With the increasing ubiquity of smartphones, mobile applications have evolved from basic communication tools to multifunctional platforms enabling disease monitoring, remote consultation, appointment scheduling, and personalised self-care (WHO, 2021). Globally, the mHealth market has experienced significant growth, with thousands of health-related apps available on Android and iOS, ranging from fitness trackers to chronic disease management tools (Statista, 2023). These innovations align with broader digital health strategies aimed at increasing access to healthcare, especially in resource-limited environments (Cugelman et al., 2020).

Users can now monitor blood pressure, track calorie intake, consult medical experts, or receive medication reminders without visiting a facility. This transformation suggests a redefinition of the doctor-patient relationship, with technology acting as both mediator and motivator (Gagnon et al., 2021).

Mobile Health Adoption in Africa and Nigeria

Africa has experienced rapid growth in mobile phone penetration, positioning the continent as fertile ground for mHealth innovations. Several African countries have deployed context-specific apps targeting maternal health, infectious disease monitoring, and telemedicine. In Nigeria, locally developed mHealth platforms such as Omomi, Hudibia, Kangpe (now Reliance HMO), and

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Doctoora offer services ranging from antenatal counselling and symptom checking to video consultations with licensed physicians (Eze et al, 2023; GSMA, 2021). Despite these developments, studies indicate that overall adoption remains low due to limited awareness, digital illiteracy, cost barriers, and distrust of online medical content.

Mobile Health Apps and Health Behaviour Change

Behaviour change is one of the core promises of mHealth technologies. Health applications often employ persuasive design features, such as reminders, progress tracking, gamification, and social reinforcement, to nudge users toward healthier habits. Evidence from developed countries suggests that apps can significantly influence behaviours such as physical activity, diet modification, smoking cessation, and medication adherence. For instance, fitness apps such as MyFitnessPal and Fitbit have been shown to improve user engagement in weight management through self-monitoring and goal-setting (Alhassani & Mustafa, 2022). When apps offer personalised recommendations, real-time feedback, and minimal navigation friction, users are more likely to integrate them into their daily routines.

Determinants of Mobile Health App Adoption

Research has shown that awareness is the foremost determinant of adoption. In many African settings, potential users are unaware of the health apps available to them or misunderstand their functions (Adum & Ejiofor, 2020). While awareness reflects respondents' knowledge of the existence of mobile health applications, functional understanding refers to their ability to navigate and utilise these applications effectively for health-related purposes. This distinction is critical, as awareness does not necessarily translate into adoption or sustained usage. Awareness gaps are further compounded by low health literacy, which limits individuals' ability to evaluate the credibility of digital health content. Perceived health needs also play a significant role. Studies reveal that users are more likely to install health apps when experiencing pressing health concerns such as chronic illness, fertility challenges, or weight gain (Neubeck et al., 2022). Thus, app uptake is often event-driven rather than preventive.

Accessibility and affordability are additional determinants. While many apps are free, data costs and inconsistent internet connectivity discourage sustained usage, especially in rural locations. Trust and privacy concerns equally shape perceptions. Users may be reluctant to share personal health information on online platforms due to scepticism about data protection (Hoque et al., 2017). In Nigeria, unregulated health claims and the proliferation of fake apps further heighten mistrust.

Theoretical Framework

The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and the Protection Motivation Theory (PMT) jointly provide a robust framework for understanding the adoption of mobile health (mHealth) applications among South-East Nigerian residents. UTAUT2 posits that behavioural intention and usage of technology are influenced by performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit. In the context of mHealth, performance expectancy reflects users' belief that mobile apps can improve health outcomes, while effort expectancy relates to ease of navigation and usability.

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Studies have shown that these constructs significantly predict mHealth adoption in developing countries (Neubeck et al, 2022). Additionally, social influence, particularly from peers, family, and healthcare professionals, plays a crucial role in users' willingness to engage with mobile health technologies.

While UTAUT2 explains the technological acceptance aspect, it does not fully capture the psychological motivation behind health-related behaviour change, which is addressed by the Protection Motivation Theory. PMT suggests that individuals' decision to adopt a health-related behaviour is driven by two appraisals: threat appraisal (perceived vulnerability and severity of a health risk) and coping appraisal (self-efficacy, response efficacy, and perceived cost) (Rogers, 1983; Farooq et al., 2021). In mHealth use, individuals who perceive themselves to be at higher health risk are more likely to adopt mobile health apps as protective tools (Luan & Wang, 2021). Moreover, response efficacy, or the belief that mHealth apps are effective in managing health conditions, has been found to strongly predict continuous usage (Alhassani & Mustafa, 2022).

Integrating UTAUT2 and PMT offers a holistic perspective by acknowledging both technological convenience and health-related psychological drivers. For instance, a user may find a health app easy to use (effort expectancy) but will only adopt it if they also believe it protects them from health risks (threat appraisal). This combined framework is therefore suitable for investigating awareness, adoption, motivation, and behavioural change associated with mobile health app usage in South-East Nigeria. The integrated conceptual model below (Figure 1) merges technological acceptance (UTAUT2) and psychological health motivation (PMT). In this framework, adoption depends not only on how the app functions but also on the user's internal drive to protect their health.

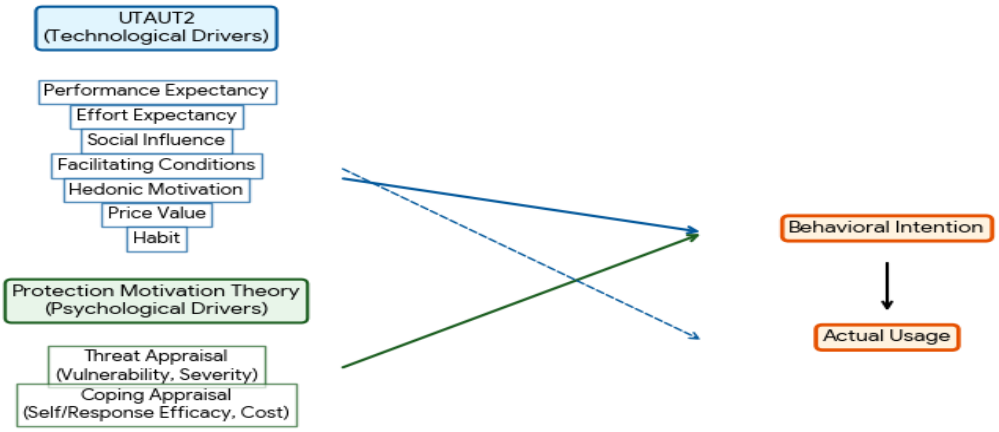

Figure 1: Integrated Conceptual Model

Methodology

The study adopted a descriptive survey design involving respondents from five South-East Nigerian states. A total of 400 respondents participated in the study. A proportionate stratified

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sampling technique was employed to ensure representation across the five South-East states, weighted by their relative population sizes. Accordingly, Anambra State accounted for 23% (n = 92), Imo State 21% (n = 84), Enugu State 20% (n = 80), Abia State 19% (n = 76) and Ebonyi State 17% (n = 68). Data were gathered using a structured questionnaire based on constructs from UTAUT2 and Protection Motivation Theory. The instrument contained sections on awareness, usage patterns, motivating health needs, and behavioural outcomes, measured using a Likert scale and multiple-choice items. Face and content validity were ensured through expert review, while reliability was assessed through a pilot study. The Cronbach's alpha coefficients for the measurement scales exceeded the acceptable threshold of 0.70, indicating satisfactory internal consistency. However, the specific alpha values for each construct were not disaggregated in the final dataset.

Descriptive statistics, including frequencies, percentages, and mean scores, were used to answer the research questions. The findings provided empirical evidence on how mobile health technologies were utilised and the extent to which they influenced health practices among South-East Nigerians.

Results and Discussions

The result of the study is presented based on the research questions. This is done below:

RQ1: What is the level of awareness among Southeast residents regarding mobile health apps and their functions?

Table 1: Awareness of Mobile Health Apps and Their Functions

Index	Frequency Distribution (SA/A/FA/D/SD)	Mean Score ($\bar{x}$)	Awareness Interpretation
I can readily identify several mobile health apps.	102 / 86 / 137 / 36 / 31	3.48	Moderately High (≈ 69%)
I know the functions of mobile health apps.	95 / 110 / 125 / 31 / 31	3.52	Moderately High (≈ 70%)
I know how to access the features of the mobile health apps.	110 / 79 / 137 / 39 / 27	3.52	Moderately High (≈ 70%)

From Table 1, the mean score of 3.48 on the first index indicates that most respondents can readily identify various mobile health apps, suggesting that such platforms are no longer novel technologies within the region. Similarly, mean scores of 3.52 on both the second and third indices show that respondents not only recognise these apps but also understand their functions and know how to access and utilise their core features.

For deeper analytical insight, the mobile health applications identified by respondents were categorised according to their relative ease of adoption and use. Specifically, apps were grouped into low-effort applications (e.g., fitness and wellness trackers), moderate-effort applications (e.g., maternal and lifestyle health apps), and high-effort applications (e.g., chronic disease management

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tools). This classification reflects differences in required user engagement, digital literacy, and perceived complexity, which significantly influence adoption behaviour.

Thus, the results reveal that awareness of mobile health apps among Southeast residents is generally high, with mean scores consistently above 3.0 across the three indicators. This implies that most of the respondents:

i. can readily identify mobile health apps,
ii. understand their functions, and
iii. know how to access and use their features.

These findings collectively demonstrate that Southeast residents possess a commendable level of operational awareness of mobile health applications, which suggests strong readiness for broader digital health engagement.

This outcome aligns with the position of Olapegba and Ayandele (2022), who found comparable levels of awareness among university students in Southwestern Nigeria, noting that although not all users were experts, most could identify and describe at least one health app they had used. Similarly, Eze et al. (2023) report high awareness of maternal health applications among women in urban communities in South-South Nigeria, although functional use varied with digital literacy. Beyond Nigeria, Boateng and Tutu (2021) observed an increase in awareness of fitness and disease management apps among young adults in Ghana, attributing the rise to social media promotion and peer referrals. These parallels indicate that the findings from Southeast Nigeria reflect a broader continental trend in which mHealth applications are gradually being integrated into everyday health-seeking behaviour. As noted by Ilozumba et al (2018) and reinforced by Eze et al. (2023), the appeal of health apps lies in their low barrier to entry – they offer accessible, low-cost, and user-friendly tools for individuals regardless of literacy level or socioeconomic status.

From a UTAUT2 perspective, the high awareness of mobile health applications among Southeast residents aligns strongly with the constructs of Performance Expectancy and Effort Expectancy. Respondents' ability to identify health apps and understand their functions suggests that they perceive such applications as useful for managing their health needs – a critical prerequisite for technology adoption. Additionally, their knowledge of how to access app features reflects low perceived complexity, satisfying the Effort Expectancy construct and indicating that users find the apps easy to use. These two constructs are among the strongest predictors of behavioural intention to adopt digital technologies under UTAUT2 (Hoque et al., 2017) Thus, the findings suggest that Southeast residents are not only familiar with mHealth apps but also theoretically primed for adoption, as the core motivational constructs of UTAUT2 have already been activated at the awareness level.

From the lens of Protection Motivation Theory (PMT), the observed awareness may also reflect an underlying threat and coping appraisal processes (Rogers, 1983). The fact that most respondents know the functions and features of mHealth apps suggests perceptions that the tools are reliable for self-monitoring, disease prevention, or emergency health guidance – demonstrating high response efficacy.

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RQ2: To what extent do Southeast residents adopt and use mobile health apps?

Table 2: Adoption of Health Apps

Index	Frequency Distribution (SA/A/FA/D/SD)	Mean Score ($\bar{x}$)	Extent (interpretation)
I readily adopt some mobile health apps.	141 / 102 / 63 / 47 / 39	3.66	Moderately High ≈ 73% intention/adoption
I frequently use relevant mobile health apps to solve health problems.	106 / 125 / 71 / 59 / 31	3.55	Moderately High ≈ 71% intention/frequent use
I regularly recommend the mobile health apps to others.	137 / 110 / 78 / 47 / 20	3.75	Moderately High ≈ 75% intention to promote/use socially

From Table 2, the first index assessed readiness to adopt mobile health apps. The mean score of 3.66 (>3.0) indicated a significant level of adoption, corresponding to an acceptance rate of 73%. The second index evaluated the apps' frequency of use for solving health problems. The mean score of 3.55 (>3.0) signifies a positive behavioural inclination, indicating 71% utilisation as a practical mechanism for managing health-related concerns. With a mean of 3.75 (>3.0) on the third index, adoption behaviour appears to extend beyond individual use to social diffusion, with 75% of respondents motivating others to use these apps.

Collectively, the findings demonstrate that mobile health app adoption among Southeast residents is not merely superficial but reflects a moderate-to-high degree of behavioural willingness, characterised primarily by trial usage, habitual engagement, and social endorsement, rather than deep institutional reliance. Despite high awareness levels, adoption remains moderate, suggesting "leakage points" between awareness and actual usage. These gaps may be attributed to factors such as high data costs, limited digital literacy, and usability challenges. Within the UTAUT2 framework, these reflect constraints in facilitating conditions and effort expectancy, while, from a PMT perspective, low self-efficacy may hinder users' transition from awareness to active engagement.

These findings corroborate Adum and Ejiofor (2020), who reported that Nigerians generally hold positive attitudes toward mHealth platforms and are willing to download and use them when the perceived utility is clear. Also, Okaro et al. (2021) and Farooq et al (2021), note that digital health engagement in Nigeria is driven more by *peer recommendation and accessibility* than by formal healthcare referral systems. Globally, Neubeck et al. (2021) and Zhang et al. (2022) observe that technological affordances such as push notifications, embedded sensors, and instant feedback loops increase behavioural stickiness, even when full institutional trust is still developing.

The transition from mere awareness (RQ1) to adoption intention (RQ2) further illustrates that access to mobile-enabled infrastructure (e.g., smartphones, data, app stores) creates an enabling

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environment for low-resistance adoption, rather than formal health education alone. Nevertheless, the expressed willingness to recommend mobile health applications to peers did not consistently translate into increased personal usage. This suggests that social influence may operate more as a secondary behavioural outcome rather than a direct driver of sustained engagement.

The findings suggest that mHealth adoption among residents of Southeast Nigeria is more of an intentional engagement than a fully habitualised reliance. This aligns with UTAUT2, particularly the constructs of Performance Expectancy (belief that mHealth apps solve health problems) and Social Influence (willingness to recommend to others), both of which were strongly reflected in the high recommendation rate (75%). However, deeper constructs such as Habit or Price Value (Hoque et al., 2017) were not directly assessed, indicating that adoption here may be more exploratory than institutionalised.

The findings further suggest that the adoption of mobile health applications was partly motivated by respondents' perceptions of health risks, particularly regarding conditions such as hypertension, diabetes, and maternal health complications. This aligns with the threat appraisal component of Protection Motivation Theory (PMT), where individuals who perceive themselves as vulnerable to health threats are more likely to seek preventive or management solutions. This indicates that fear or concern about potential health deterioration (threat appraisal) served as a motivational trigger for adoption, particularly when individuals perceived these applications as effective coping mechanisms.

While this study did not explicitly test moderating effects such as gender and education level, future research can explore how these variables influence the relationship between awareness and adoption, in line with the UTAUT2 model.

RQ3: What major health needs motivate Southeast residents to adopt and use mobile health apps?

Table 3:Major Health needs that motivate the adoption and use of health apps

Index	Frequency Distribution (SA/A/FA/D/SD)	Mean Score ($\bar{x}$)	Extent (interpretation)
I use mobile health apps to maintain physical fitness, healthy eating, and general well-being.	70 / 129 / 129 / 8 / 36	3.58	Moderately High ≈ 71% wellness-driven motivation
I use mobile health apps for health checks, tracking and monitoring.	86 / 110 / 149 / 31 / 16	3.51	Moderately High ≈ 70% tracking/monitoring motivation
I use mobile health apps for health inquiries and medical information.	71 / 102 / 153 / 39 / 27	3.38	Moderate ≈ 67% information-seeking motivation

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From Table 3, the first index, which assessed the use of apps for body fitness, healthy diet, and general wellbeing, recorded a mean score of 3.58 (71%), indicating high engagement. The second index demonstrated that 70% of respondents (mean = 3.51) actively use mobile health apps for health checks, tracking, and monitoring. The third index showed 67% usage (mean = 3.38) for health inquiries and access to medical information, reflecting the growing need for instant, reliable health information. The findings are consistent with Uche (2017), who reports that health-seeking behaviour is influenced by individual needs and perceived benefits. Similarly, Neubeck et al. (2022) emphasised that mobile health apps serve as companions, collecting data on physical activity, nutrition, sleep, and other wellness parameters.

Earlier, Cugelman et al. (2020) had indicated that apps that focused on nutrition, physical activity, and general wellness are most widely used. Recent global evidence, however, shows a shift toward clinical functionalities, such as chronic disease management and teleconsultation (Nouri et al., 2022). Thus, while Southeast Nigeria residents currently prioritise wellness and preventive use, there is potential to expand adoption toward medical and clinical support functions.

The findings highlight several UTAUT2 constructs that influence adoption. Performance Expectancy is evident, as respondents perceive that mobile apps improve health maintenance, monitoring, and access to information. Hedonic Motivation and Habit are also present, particularly in fitness and wellness apps, where gamified tracking and progress reminders promote recurrent use. However, in the South-East Nigerian context, infrastructural limitations such as unstable electricity supply and inconsistent internet connectivity significantly influence mobile health app utilisation. These factors align with the facilitating conditions construct within the UTAUT2 model, highlighting how environmental constraints may impede adoption despite high awareness levels.

Using apps for health monitoring and tracking reflects both Threat Appraisal (anticipation of health risks) and Coping Appraisal (confidence in response efficacy and self-efficacy) as highlighted by PMT. Engagement is largely preventive and wellness-oriented, rather than driven solely by acute health threats (Neubeck et al., 2022). Therefore, the major health needs driving adoption of mobile health apps among Southeast residents include:

i. Maintaining body fitness, diet, and general well-being.
ii. Tracking, monitoring, and checking health conditions.
iii. Accessing health information and medical inquiries.

Nevertheless, concerns surrounding data privacy and security emerged as potential barriers to usage. Given that mHealth apps often require access to sensitive personal and health-related information, some respondents expressed reservations about the safety of their data. Within the Protection Motivation Theory (PMT) framework, such concerns can be interpreted as perceived risks that undermine coping appraisal, particularly by reducing users' confidence in the technology's reliability and safety. Consequently, even when individuals recognise the benefits of mHealth applications, low trust in data security may hinder sustained adoption and engagement.

RQ4: To what extent does the use of mobile health apps influence or alter the health behaviour of South-East residents?

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Table 4: Change of health behaviour through the usage of the health apps

Index	Frequency Distribution (SA/A/FA/D/SD)	Mean Score ($\bar{x}$)	Extent (Interpretation)
I adhere to the health instructions of the mobile health apps	114 / 133 / 82 / 43 / 20	3.7	High ≈ 74% (adherence-driven behaviour change)
I now try to maintain healthy living, unlike before the apps	90 / 94 / 149 / 39 / 20	3.49	Moderately High ≈ 69% (lifestyle improvement motivation)
I frequently pay attention to my health through the apps	70 / 106 / 145 / 55 / 16	3.4	Moderately High ≈ 68% (health monitoring motivation)

From Table 4, the first index examined the extent to which respondents adhere to health instructions provided by mobile health apps, which recorded a mean score of 3.70 (74%), indicating high adherence. The second index assessed whether respondents tried to maintain healthy living, compared with not using the apps. The mean score of 3.49 (69%) indicates that mobile health apps have contributed to positive lifestyle modifications. The third index examined the level of attention to health through app usage. A mean of 3.40 (68%) indicates that, while users generally engage in health-promoting activities via apps, the intensity of engagement varies.
Globally, mHealth apps have been shown to positively influence behaviour in diverse contexts:

i. In the United States and Europe, apps with adherence-focused features significantly improved medication adherence, physical activity, and dietary behaviours (Cugelman et al., 2020).
ii. In South Asia, wellness and preventive health apps fostered measurable lifestyle improvements, particularly in exercise and nutrition tracking (Hoque et al., 2017).

These comparisons indicate that residents of Southeast Nigeria's engagement with mobile health apps mirrors global trends, in which apps serve as practical tools for transforming knowledge into action and promoting preventive health behaviours (Simblett et al., 2021).

The findings reflect several UTAUT2 constructs, including Performance Expectancy, as respondents perceive tangible benefits from adhering to the app's guidance, such as improved health outcomes and better lifestyle management (Nouri et al., 2022). For Effort Expectancy, the ease of use and accessibility of mobile apps encourage sustained adoption and behaviour change. In the South-East Nigerian context, infrastructural limitations such as unstable electricity supply and inconsistent internet connectivity significantly influence mobile health app utilisation. These factors align with the facilitating conditions construct within the UTAUT2 model, highlighting how environmental constraints may impede adoption despite high awareness levels.

The behavioural changes also aligned with the Protection Motivation Theory. Thus, Threat Appraisal is associated with awareness of potential health risks, which motivates users to

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proactively comply with the app's instructions. Therefore, the study reveals that Southeast Nigeria residents alter their health behaviour through mobile health app usage by:

i. Adhering to health instructions provided by apps
ii. Maintaining healthy living practices, unlike those without apps
iii. Frequently monitoring and paying attention to their health

Conclusion and Recommendations

This study examined how mobile health (mHealth) applications shape health awareness, adoption, motivation, and behavioural outcomes among residents of South-East Nigeria. The findings reveal a clear progression from awareness to behavioural transformation, highlighting that digital health technologies are no longer peripheral tools but emerging drivers of self-managed health practices in the region.

Overall, this study concludes that mobile health apps have begun to democratise access to healthcare in South-East Nigeria by bridging informational and infrastructural gaps in the healthcare system. However, to maximise impact, awareness must be converted into institutionalised behavioural integration through supportive policies, trust-building, and digital inclusion initiatives.

Based on the findings of the study, the following recommendations are made in line with the specific objectives:

i. Health agencies and communication stakeholders should move beyond mere sensitisation to structured digital health literacy programmes.
ii. The Federal and State Ministries of Health should formally integrate verified mHealth applications into the primary healthcare system.
iii. App developers, in collaboration with public health experts, should design context-specific mobile health applications that address residents' dominant health needs – such as fitness, nutrition, preventive care, and chronic disease management.
iv. To reinforce positive health behaviour, developers and health educators should incorporate behavioural reinforcement features such as reminders, gamified progress tracking, and feedback dashboards.
v. Developers of mobile health applications should prioritise culturally relevant design features, including local language options, simplified navigation interfaces, and context-specific health content tailored to prevalent conditions such as hypertension and diabetes in South-East Nigeria.

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Declarations

AI Usage Statement: The authors did not use artificial intelligence or AI-assisted technologies in the generation of the content or the analysis of the data for this manuscript.

Data Availability: The data that support the findings of this study are available from the corresponding author upon request

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Conflict of Interest: We declare that there are no known competing financial interests or personal relationships that could have appeared to influence this report.

Ethical Approval: The study protocol was reviewed and approved by the Ethics and Quality Assurance Committee of Abia State University, Nigeria, in October 2024. The study was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and its later amendments.

Author Contributions: This work is an outcome of a collective effort of the authors. However, the authors made the following specific contributions: Christian Don Afulike: Conceptualisation, methodology, funding acquisition, and project administration.Gladys Amarachi Osuagwu: Investigation (data collection and data analysis). Emenike Ikedichi Ubani: Validation, review & editing, Innocent Paschal Ihechu: Methodology moderation, report coordination, and project supervision.

References

Adum, C., & Ejiofor, N. (2020). Perception and use of mobile health platforms among Nigerians. *Journal of Communication and Media Research*, *12*(2), 45–58.

Alhassani, S., & Mustafa, M. (2022). Determinants of continuous use intention of mobile health applications. *International Journal of Healthcare Management*, *15*(3), 215–227.

Boateng, R., & Tutu, K. (2021). Understanding mobile health adoption in Ghana: A user-centric perspective. *African Journal of Information Systems*, *13*(1), 67–84.

Budd, J., Miller, B. S., Manning, E. M., Lampos, V., Zhuang, M., Edelstein, M., ... & McKendry, R. A. (2020). Digital technologies in the public-health response to COVID-19. *Nature Medicine*, *26*(3), 566–577. https://doi.org/10.1038/s41591-020-1011-4

Cugelman, B., Thelwall, M., & Dawes, P. (2020). Online interventions for healthy behaviour change: A meta-analysis. *Journal of Medical Internet Research*, *22*(11), Article e156.

Eze, B., Nwachukwu, J., & Ilozumba, O. (2023). Digital health adoption in post-pandemic Nigeria: Prospects and policy gaps. *African Health Sciences*, *23*(1), 41–55.

Farooq, A., Salam, M., & Ahmad, M. (2021). Protection motivation theory and the adoption of mobile health applications in developing countries. *Technology in Society*, *67*, Article 101748.

E-ISSN: 2735-9891 DOI: https://doi.org/10.5281/zenodo.20254901

Fischer, A., Mertens, A., & Krah, J. (2023). Health app engagement and sustained usage behaviour: A behavioural model analysis. *Computers in Human Behavior*, *141*, Article 107605.

Gagnon, M. P., Ngangue, P., Payne-Gagnon, J., & Desmartis, M. (2021). m-Health adoption by healthcare professionals: A systematic review. *Journal of the American Medical Informatics Association*, *28*(5), 1185–1194. https://corpus.ulaval.ca/server/api/core/bitstreams/4d72ec44-d2ae-2b71-e053-2528090a90b1/content

GSMA. (2021). *State of mobile internet connectivity 2021*. GSMA Intelligence. https://www.gsmaintelligence.com/research/the-state-of-mobile-internet-connectivity-2021

Hoque, R., Sorwar, G., & Bao, Y. (2017). Investigating factors influencing the adoption of mHealth apps in developing countries: A study using extended UTAUT2. *Health Informatics Journal*, *23*(2), 1460–1479.

Ilozumba, O., Dieleman, M., Kraamwinkel, N., Van Belle, S., Chaudoury, M., & Broerse, J. E. W. (2018). I am not telling. The mobile is telling: Factors influencing the outcomes of a community health worker mHealth intervention in India. *PLoS ONE*, *13*(3), Article e0194927. https://doi.org/10.1371/journal.pone.0194927

Luan, X., & Wang, Y. (2021). Applying protection motivation theory to understand health app usage for disease prevention. *Telematics and Informatics*, *65*, Article 101731.

Neubeck, L., Redfern, J., Fernandez, R., & Freedman, S. (2022). The role of health needs in mHealth adoption: Evidence from cardiac patients. *BMC Cardiovascular Disorders*, *22*(1), Article 104.

Nouri, S., Niakan, M., & Hosseini, F. (2022). Understanding mobile health adoption in low- and middle-income countries. *Digital Health*, *8*, Article 20552076221087311.

Okaro, C. S., Ohagwu, C. C., & Njoku, J. O. (2021). Health system challenges and healthcare delivery in South-East Nigeria. *Nigerian Health Journal*, *21*(3), 122–130.

Olapegba, P. O., & Ayandele, O. (2022). Awareness and attitudes toward mobile health apps among university students in Nigeria. *Nigerian Journal of Behavioural Sciences*, *30*(1), 15–27.

Rogers, E. M. (1983). *Diffusion of innovations* (3rd ed.). Free Press.

E-ISSN: 2735-9891 DOI: https://doi.org/10.5281/zenodo.20254901

Simblett, S., Greer, B., Matcham, F., Curtis, H., Polhemus, A., Ferrão, J., & Wykes, T. (2021). Barriers to and facilitators of engagement with remote measurement technology for managing health: Systematic review. *JMIR mHealth and uHealth, 9*(3), Article e14670.

Statista. (2023). *Number of mHealth apps available worldwide from 2015 to 2023*. Statista Research Department. https://www.statista.com/statistics/1482971/uk-top-mhealth-apps/

Uche, O. E. (2017). Factors affecting health seeking behaviour among rural dwellers in Nigeria and its implication on rural livelihood. *European Journal of Social Sciences Studies, 2*(2), 44–58. https://www.oapub.org/soc/

World Bank. (2022). *World development indicators: Health expenditure and access*. World Bank Publications. https://databank.worldbank.org/id/9fb36b1c

World Health Organization. (2021). *Global strategy on digital health 2020–2025*. World Health Organization. https://www.who.int/docs/default-source/documents/gs4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf

World Health Organization. (2023). *Noncommunicable diseases country profiles*. World Health Organization. https://extranet.who.int/ncdccs/Files/instructions_en.pdf