

## EXAMINING THE ACCEPTANCE OF MHEALTH APPLICATIONS IN PAKISTAN: INSIGHTS FROM THE TECHNOLOGY ACCEPTANCE MODEL (TAM)

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DOI: <https://doi.org/10.5281/zenodo.17774595>

| Received        | Accepted         | Published        |
|-----------------|------------------|------------------|
| 09 October 2025 | 15 November 2025 | 29 November 2025 |

### ABSTRACT

The research examines the acceptance of mobile (mHealth) applications by applying the Technology Acceptance Model (TAM). Precisely, the research aims to access the TAM constructs such as; Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude, and Behavioral Intentions into Pakistan's settings. Researchers collected the data from 250 participants. Analysis was done using correlational and regression analysis. Results pointed out that the Attitude, Behavioral intention, PU and PEOU were significantly predicted by the usage of mHealth applications. In addition to that, TAM constructs indicated strong positive relationships among themselves: There was positive association among PEOU and PU and Attitude, while PU was positively associated to Attitude as well as Behavioral Intention; Attitude was also found to have been positively influencing Behavioral Intention. These results substantiate the main assumptions of TAM, confirming that the usefulness and the perceived ease of use are important drivers of positive attitudes and adoption intentions. The research highlights the significance of the design of mHealth applications that are user-friendly valuable to improve adoption a public engagement in Pakistan.

**Keywords:** mHealth applications, Technology Acceptance Model (TAM), Perceived Usefulness, Perceived Ease of Use, Attitude, Behavioral Intention, Pakistan, Acceptance

### INTRODUCTION

In the contemporary provision of healthcare, mobile healthcare (mHealth) applications have turned out to be a very powerful tool, and are being increasingly used (Adnan et al., 2025). These applications enable the user to monitor vital signs, tracking the fitness-related goals, providing the reminders for using medicines on time, and connecting the health-care experts and users in real-time (Pandey et al., 2016). A lot of factors have facilitated the proliferation

of mHealth app, including the advancements and progress in mobile technology. The increasing connectivity through the availability and usage of the high-speed internet, and the increasing demand for readily accessible healthcare solutions (Ukaegbu & Fan, 2025; Iyawa et al., 2015). Pakistan, with its increasing demand for smartphones and an expanding healthcare sector has not remained untouched by this transformative wave of using mHealth

applications.

Pakistan, with its fifth largest population in the world, has a healthcare system that serves a tremendously diverse population with different needs and usages. The Several critical healthcare-related challenges can be addressed with the widespread adoption of mHealth apps, as the geographical diversity of the country and unequal distribution of facilities of healthcare have made people's access a challenge. This gap can be mitigated with the provision of remote consultations, health information dissemination, and telemedicine services (Ali and Khan, 2021). Promotion of health awareness is critical for earlier intervention and prevention of disease. To disseminate the health information, mHealth apps can serve as indispensable platforms. These apps can provide users with awareness about disease existence, prevention and therefore a healthy living scenario (Khan et al., 2017).

As in so many other countries, Pakistan is under immense pressure of rapidly proliferating chronic diseases. mHealth apps help the individuals with the management of such conditions through important features, including remote monitoring, management of medication, tracking of the lifestyle (Shahid et al., 2019).

This study delves into the acceptance and adoption of mHealth apps in Pakistan, exploring the attitudes, intentions, and perceptions, of the healthcare professionals and the masses toward the respective applications. Through the application of the Technology Acceptance Model (TAM) framework, we delve to uncover the factors for the adoption of the mHealth apps, and explore the strategies that could increase their effectiveness in the landscape of the Pakistan healthcare system.

### Research Objectives

- 1: To evaluate the perceived ease of use and usefulness of the mHealth applications among the general public in Pakistan.
- 2: To study the intention with which mHealth applications are used among the general public of Pakistan.

### Research Questions

RQ1. What are the ratings of the perceived ease of use (PEOU) and perceived usefulness (PU) of the mHealth apps among the masses in Pakistan?

RQ2. what is the level of intention to use mHealth applications among the general public in Pakistan?

RQ3. How do perceived ease of use (PEOU) and perceived usefulness (PU) influence the intention to use mobile Health applications among the general public in Pakistan?

### Hypotheses

H1: This is likely that the usage of mHealth applications is a significant predictor of Perceived Usefulness of public in Pakistan.

H2: This is more likely that the usage of mHealth applications is a significant predictor of enhancing Perceived ease of use among public in Pakistan.

H3: This is likely that the usage of mHealth applications is a significant predictor of affecting Attitudes of public in Pakistan.

H4: This is more likely that the usage of mHealth applications is a significant predictor of shaping behavioral intention of public in Pakistan

H5: There is likely to be a significant association between PEOU and attitude.

H6: This is more likely that there is a significant relationship between PU and attitude.

H7: There is likely to be a significant relationship between PEOU and PU.

H8: This is assumed that there is a positive relationship between PU and behavioral intention.

H9: This is likely that there is a positive association between attitude and changing of behavioral intention.

### LITERATURE REVIEW

#### mHealth Applications in Pakistan

Pakistan's healthcare landscape faces multifaceted challenges, including limited access to healthcare facilities, particularly in rural areas, low health literacy, high maternal and child mortality rates, and the burden of both communicable and non-communicable

diseases (National Institute of Population Studies, 2019; World Health Organization, 2021).

In this situation, mHealth apps, have become a force of transformation, that mitigates the gaps in healthcare accessibility, improve the outcomes of health, and empower the users with services that are related to dissemination of health information and services. The unprecedented adoption of smartphone usage is remarkable, with usage reaching over 181m by the year 2020 (Pakistan Telecommunication Authority, 2021).

A unique opportunity is provided by the widespread use of the mobile technology to utilize the availability of the mHealth apps for healthcare interventions, education the patients, monitoring of the individuals' health, and intervention in the change in behavior. However, technological infrastructure, users' attitudes, and cultural considerations are various factors that affect the acceptance of the successful integration and acceptance of mHealth applications into Pakistan's healthcare ecosystem. Researchers have extensively turned to the TAM to understand the acceptance of technology, especially the mHealth apps. Developed by Davies (1989), TAM is a theoretical framework, that is well-established and is employed to explore the factors that influence the individuals' willingness to adopt the technology. two primary determinants are Central to TAM: perceived ease of use (PEOU) and perceived usefulness (PU). how easy it is to use a particular technology with regards to individual's perception is gauged by PEOU, while PU gauges the extent to which a user believes that the technology enhances their performance or provides utility (Davis, 1989).

Extensive employment of TAM has taken place to investigate technology acceptance in various contexts, which include the adoption of mobile applications. In the domain of healthcare, TAM has been very important in understanding of the users' acceptance of the systems of health information, electronic health records, and mHealth applications (Venkatesh et al., 2003; Lai et al., 2019). While there are

evident potential benefits of mHealth apps in Pakistan, there is a substantial gap in research that concerns their adoption and acceptance (Ali et al., 2021). This gap, despite of the existence of the unique cultural, social, and economic context of Pakistan, exists, and may pose opportunities as well as challenges, for the efficient and successful incorporation of mHealth applications into the healthcare system (Saif et al., 2019). Socio-economic disparities, cultural beliefs, digital literacy, and healthcare infrastructure are some of the most critical factors that can influence the acceptance and usage of mHealth applications (Khan et al., 2017).

Provided such deliberations, it is indispensable that a systematic investigation be conducted into the factors that impact the adoptability of mHealth applications in healthcare landscape of Pakistan, especially, with a focus on general public and healthcare professionals (Jabeen et al., 2020). By increasing our understanding of mHealth applications' acceptance in Pakistan, the study adds to the effective utilization of this technology to address and solve the challenges in the domain of healthcare and subsequently improve the well-being of the Pakistani population (Pandey et al., 2016).” Given these reflections, it is indispensable that a systematic investigation be conducted into the factors that influence the acceptance and adoption of mHealth applications in Pakistan, while particularly focusing on the healthcare specialists and the general public. This research employs the TAM framework to conduct analysis of the perceived ease of use, the perceived usefulness, and their effect on the will of the users to use mHealth applications.

### Technology Acceptance Model (TAM)

Proposed by Davis (1989), the Technology Acceptance Model (TAM) contributes as the foundational theoretical framework to understand the acceptance of technology, which includes the mHealth applications (Davis, 1989). TAM postulates that the acceptance of technology by the users is mainly influenced by two key aspects: Perceived usefulness (PU) and perceived ease of use

(PEOU). Perceived Ease of Use (PEOU) represents the perception of a user of how simple, easy, and user-friendly a specific technology is (Davis, 1989). PEOU, in context of the mHealth apps, reflects judgment of the user in how simple or straightforward it is to circumnavigate and use the mHealth application for tasks related to healthcare. Perceived Usefulness (PU) relates to the degree to which users think that the mHealth app technology increases their productivity, provides utility, or enhances their performance, (Davis, 1989).

When it comes to the mHealth apps, PU means the belief of the user that the mHealth app positively affects their healthcare needs, such as providing accurate health information, facilitating health monitoring, or improving overall health outcomes. TAM posits that users' attitudes and intentions toward using technology are directly influenced by PEOU and PU. Specifically, users are more likely to accept and use a technology if they perceive it as easy to use and believe it offers tangible benefits (Davis, 1989).

In terms of healthcare services, mobile health applications have been extensively utilized to examine the adoption of telemedicine, electronic health records (EHRs), and other innovations in health realities. For instance, (Holden and Karsh, 2010) conducted research to investigate how medical professionals saw EHR structures and discovered that clients' desire to adopt EHRs was highly influenced by the systems' apparent utility. Similarly, (Venkatesh et al., (2003) discovered that the perceived usefulness became a reliable predictor of physicians' intention to use telemedicine platforms. Previous research has highlighted the need of addressing privacy concerns in order to advance the discussion and facilitate the adoption of health-related innovations (e.g., Dinev and Hart, 2006; Tension and Agarwal, 2009). The acceptance and use of mobile health applications (mobile health) has been more and more well-known in recent years, altering the landscape of healthcare delivery and having an impact on personal commitment. As technological advancements continue to

reshape the medical services industry, understanding the factors that impact consumers' acceptance of mobile health apps has become crucial information for developers, providers of medical services, and legislators. This writing evaluation provides an overview of the major debates and findings in the field of mobile health engaging quality, with a focus on the Technology Acceptance Model and its extensions.

The availability of cell phones and the internet surely affects the adoption of mobile health apps. There is a strong correlation between the amount of time spent on a cell phone and the adoption of mobile health, according to studies done in Pakistan, where internet and mobile phone access are expanding quickly (Saleem et al., 2018). However, the use of mobile health applications, or mHealth apps, has spread throughout the world, including Pakistan, where the healthcare system may also find it difficult to offer more affordable and easily accessible services to sizable populations. The study examines how healthcare professionals' and the user's intentions to use mHealth applications are influenced by perceived usefulness (PU) and ease of use (PEOU) in the context of Pakistan. The unique socio-cultural elements, healthcare issues, and technological environment that could affect the uptake of mHealth applications in Pakistan are acknowledged in the TAM adaptation.

### **Perceived Ease of Use (PEOU)**

The ease of use of mHealth applications in Pakistan takes into account the application's cultural appropriateness, user interface design, and users' levels of digital literacy. It's important to comprehend how user-friendly these apps are, especially for people with different degrees of technological expertise.

#### **a) Perceived Usefulness (PU)**

The perceived utility of mobile health applications in Pakistan is strongly correlated with their capacity to tackle particular healthcare issues in the nation. This includes facilitating communication with healthcare providers, enabling remote health monitoring, and making trustworthy healthcare information

accessible. The degree to which the features of mHealth applications match the requirements and expectations of Pakistani users affects their usefulness.

## METHOD

To investigate the hypothesis and achieve the goals of this study, the survey approach was employed. Quantitative research was aided by a sampling technique for data collection. The demographics, sample size, sampling technique, and data collection are all covered in great detail in the research study. The sample is the users from Pakistan. Its 250 users come from a variety of backgrounds, including age groups, educational levels, and levels of technological experience. This group was chosen because enabling people to actively manage their health and access healthcare information and services depends on the general public's acceptance of mobile health applications.

## FINDINGS AND DISCUSSION

| characteristics    |               | frequency | Percentages |
|--------------------|---------------|-----------|-------------|
| Age                | 18-27         | 153       | 61.2        |
|                    | 28-37         | 48        | 19.2        |
|                    | 38-47         | 30        | 12.0        |
|                    | 48-57         | 17        | 6.8         |
|                    | 57 and above  | 2         | 8           |
| Gender             | Male          | 112       | 44.8        |
|                    | Female        | 138       | 55.2        |
| Level of education | Undergraduate | 165       | 66.0        |
|                    | Graduate      | 54        | 21.6        |
|                    | Postgraduate  | 31        | 12.4        |
| Total              |               | 250       | 100.0       |

The age group of 18–27 comprises the majority of participants (61.2%), followed by 28–37 (19.2%) and 38–47 (12.0%). The percentage of females in the sample is slightly higher (55.2%) than that of males (44.8%). The majority of people (66.0%) hold an undergraduate degree,

## INSTRUMENTS

The technology acceptance model scale was adopted and altered by the researcher. Fred davis created the scale in 1989. Tam is a theoretical framework that aids in comprehending how new information technologies are accepted by users. The scale assesses a number of variables, including perceived utility and perceived ease of use, that affect users' acceptance of a technology. Since its creation, tam has been extensively utilized and accepted in numerous studies concerning the adoption and acceptance of technology (park et al., 2024; rosli et al., 2023; rahimi et al., 2018; ma & liu, 2006). A structured questionnaire is used to collect the data. The purpose of the questionnaire is to gather information on important factors associated with the tam framework's acceptance of mobile health applications.

followed by graduates (21.6%) and postgraduates (12.4%). 61.2% of the sample is employed, compared to 38.8% who are unemployed.



| Hypotheses | Dependent Variable           | R     | R <sup>2</sup> | Adjusted R <sup>2</sup> | Std. Error | $\beta$ (Standardized) | t     | p-value |
|------------|------------------------------|-------|----------------|-------------------------|------------|------------------------|-------|---------|
| H1         | Perceived Usefulness (PU)    | 0.314 | 0.099          | 0.095                   | 3.602      | 0.314                  | 5.213 | <0.001  |
| H2         | Perceived Ease of Use (PEOU) | 0.189 | 0.036          | 0.032                   | 3.629      | 0.189                  | 3.025 | 0.003   |
| H3         | Attitude (ATT)               | 0.277 | 0.077          | 0.073                   | 1.699      | 0.277                  | 4.544 | <0.001  |
| H4         | Behavioral Intention (BI)    | 0.091 | 0.008          | 0.004                   | 1.784      | 0.091                  | 1.435 | 0.152   |

The results from the above regression analyses indicate that the usage of mHealth applications among the general public in Pakistan significantly influences several key constructs of the Technology Acceptance Model. Specifically, usage significantly predicts **Perceived Usefulness** ( $\beta = 0.314$ ,  $p < 0.001$ ), **Perceived Ease of Use** ( $\beta = 0.189$ ,  $p = 0.003$ ), and **Attitude toward usage** ( $\beta = 0.277$ ,  $p < 0.001$ ), suggesting that as individuals engage more with mHealth applications, they perceive them as more useful and easier to use, which in turn positively shapes their attitudes. However, the effect of usage on **Behavioral Intention** ( $\beta = 0.091$ ,  $p = 0.152$ ) was not statistically

significant, indicating that while users recognize the usefulness and ease of use of these applications, this does not directly translate into a stronger intention to adopt or continue using them. The R<sup>2</sup> values indicate that usage accounts for approximately 9.9% of the variance in Perceived Usefulness, 3.6% in Perceived Ease of Use, and 7.7% in Attitude, demonstrating the model's moderate capacity for explanation. These results highlight the fact that although mHealth use can influence attitudes and perceptions, other factors might have an impact on how Pakistani citizens form their behavioral intentions.

| Hypotheses | Variables                                    | r    | p      |
|------------|----------------------------------------------|------|--------|
| H5         | Perceived Ease of Use → Attitude             | .485 | < .001 |
| H6         | Perceived Usefulness → Attitude              | .407 | < .001 |
| H7         | Perceived Ease of Use → Perceived Usefulness | .619 | < .001 |
| H8         | Perceived Usefulness → Behavioral Intention  | .513 | < .001 |
| H9         | Attitude → Behavioral Intention              | .407 | < .001 |

Pearson correlation results as mentioned in the above table showed that Perceived Ease of Use was positively associated with Attitude,  $r = .485$ ,  $p < .001$ , while Perceived Usefulness also showed a significant positive relationship with Attitude,  $r = .407$ ,  $p < .001$ . Perceived Ease of Use demonstrated a strong positive correlation with Perceived Usefulness,  $r = .619$ ,  $p < .001$ .

Additionally, Perceived Usefulness was significantly related to Behavioral Intention,  $r = .513$ ,  $p < .001$ , and Attitude was also positively associated with Behavioral Intention,  $r = .407$ ,  $p < .001$ . These findings support above hypotheses and align with the Technology Acceptance Model.

## CONCLUSION

The Technology Acceptance Model (TAM) is used in the study to investigate the variables affecting Pakistani citizens' adoption of mHealth applications. In line with earlier TAM research, the results showed that perceived utility and ease of use are crucial in influencing user attitudes and behavioral intentions. People are more likely to plan to use mHealth applications when they find them useful and easy to use, according to strong positive associations between PEOU, PU, attitude, and behavioral intention. Overall, the findings highlight the ongoing value of TAM in comprehending the adoption of digital health while highlighting the necessity for developers and policymakers to address contextual obstacles that impede the actual use of mHealth services in Pakistan.

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