

# Overcoming Barriers to Telehealth: A Study on Smartphone Consultation Services in Nairobi Using the UTAUT Framework

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## Abstract

*The rapid expansion of the mobile market has catalysed significant advancements in healthcare through the development of smartphone-based consultation services. This study investigates factors influencing healthcare professionals' adoption and usage of these services in Nairobi, Kenya, leveraging the Unified Theory of Acceptance and Use of Technology (UTAUT). We collected quantitative data via a structured online survey from 48 healthcare providers actively involved in telemedicine. Our analysis identified key determinants: performance expectancy, effort expectancy, social influence, and facilitating conditions. The results revealed that performance expectancy and social influence positively influenced the behavioural intention to adopt smartphone-based consultations, while effort expectancy had a negative impact. Gender, age, experience, and voluntary usage were significant moderators. The regression analysis indicated that the younger, the more experienced, and the female healthcare providers showed higher intentions to adopt these technologies. Despite infrastructure and regulatory challenges, the widespread use of smartphones in Kenya provides a promising platform for enhancing healthcare delivery. The findings highlight the need for targeted training and awareness programs, alongside clear regulatory frameworks, to overcome adoption barriers. This study offers localised insights into telemedicine adoption, highlighting the potential of smartphone-based consultation services to alleviate healthcare system burdens and improve access, particularly in urban and underserved regions. These insights are crucial for policymakers, healthcare providers, and technology developers aiming to enhance telemedicine adoption and integration in Nairobi and similar contexts.*

**Keywords:** Healthcare Adoption, Healthcare Professionals, Mobile Health, Smartphone-based Consultation, Telemedicine, UTAUT.

## Introduction

The global mobile market growth has spurred the creation of new markets across various industries centred on mobile functionality [1]. The healthcare industry mirrors this trend by actively developing services and applications that leverage digital connectivity in hospitals, organisations, and other healthcare entities [2, 3]. Healthcare professionals now use smartphone-based voice and video consultations, while patients use applications to manage their health data and directly control specific health conditions,

exemplifying this growth. These applications are reported to enhance hospitals' efficiency and effectiveness and reduce organisational costs. As a result, they have become an integral part of hospital information systems (HISs), streamlined operations and improved patient care management [4].

However, end-users needs and characteristics have often been overlooked in favour of functional features and advanced techniques when adopting these applications and mobile technologies. This approach has resulted in low usage rates, resistance, and

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desertion of health information technology (IT) and increased requests for alternative methods, highlighting the importance of user-centred design in healthcare technology adoption. [5-7] To achieve substantial benefits, it is crucial to consider end-users reactions thoroughly.

The Technology Acceptance Model (TAM), grounded in social psychology concepts, can define and test individual end-users' intentions to adopt new technology. This model helps understand the psychological factors that influence users' acceptance and use of the latest technological innovations, providing valuable insights into improving user adoption rates and enhancing the overall effectiveness of technology implementations. [8] TAM has been the gold standard in industries other than healthcare [9]. Additionally, the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which incorporates various models of human behaviour theory, can analyse end-users' intentions to use medical IT [10]. Studies analysing end-users intentions to use medical IT are vigorously carried out and tested, utilising single models like TAM or UTAUT or combined hypotheses that integrate various existing models into an adjusted framework. [11-14] However, the reported results exhibit internal discrepancies that future studies can address by confirming the characteristics accounted for by applications and end-users.

The primary objective of this study is to identify and analyse the factors that influence healthcare providers' intentions to adopt smartphone-based consultation services for outpatient care in Nairobi. The study then compared this actual usage with various factors that influence users' intentions, providing a comprehensive understanding of how these factors impact real-world adoption and usage patterns of the services. Additionally, the study aims to identify service provision gaps that must be addressed to facilitate the widespread adoption and effective implementation of these services.

## **Problem to be Solved**

Like many urban centres in developing countries, Nairobi's healthcare system faces significant challenges, such as overcrowded hospitals, limited access to specialised care, and a shortage of healthcare professionals. The COVID-19 pandemic has exacerbated these issues, overwhelming healthcare facilities and necessitating alternative methods of patient care. Smartphone-based consultation services offer a potential solution by enabling healthcare providers to deliver care remotely, thereby reducing the burden on healthcare facilities and increasing access to medical services for patients unable to visit clinics in person.

## **Existing Solutions**

Several telemedicine solutions have been implemented in Nairobi to address healthcare challenges. These include platforms like mHealth, *after mHealth* and *Penda Health*, which use mobile technology to support healthcare delivery and various teleconsultation services that connect patients with healthcare providers via video calls, messaging apps, and other digital tools. While these solutions have shown promise, their adoption has been limited by several factors, including inadequate infrastructure, lack of awareness among healthcare providers and patients, and regulatory challenges. [15, 16].

## **The Best Solution**

Among various telemedicine solutions, smartphone-based consultation services have emerged as the most practical and accessible option for outpatient care in Nairobi [16, 17]. Smartphones are widely used in Kenya and have a high penetration rate, making them an ideal platform for telemedicine services. These services can be implemented through mobile apps facilitating video consultations, secure messaging, and integrating electronic health records (EHR). By leveraging the widespread use of smartphones, these solutions can significantly enhance

healthcare delivery, especially in remote and underserved areas [18].

## Limitations

Despite the potential benefits of smartphone-based consultation services, several limitations need to be addressed to ensure their successful implementation:

1. **Infrastructure Challenges:** Reliable internet connectivity and smartphone access are not uniform across all areas of Nairobi, particularly in low-income and rural regions, hindering widespread adoption.
2. **Regulatory and Policy Barriers:** The lack of clear regulations and guidelines for telemedicine in Kenya poses a significant barrier. Healthcare providers may hesitate to adopt new technologies without clear legal frameworks and policies.
3. **Training and Awareness:** Both healthcare providers and patients may lack the necessary training and awareness to effectively use smartphone-based consultation services, resulting in low adoption rates and ineffective use.

4. **Data Security and Privacy:** Ensuring the security and privacy of patient data is crucial. Concerns about data breaches and protecting sensitive health information can deter providers and patients from using these services.

## Achievements

Despite these limitations, notable achievements have been made in implementing telemedicine in Nairobi. Several pilot projects and initiatives have demonstrated the feasibility and effectiveness of smartphone-based consultation services. Platforms like SemaDoc and MyDawa have successfully connected patients with healthcare providers, offering remote consultations, prescription services, and health education [16, 17]. These achievements highlight the potential of telemedicine to improve healthcare access and delivery in Nairobi.

## Schematic Diagram

A graphical abstract or schematic diagram illustrating the study's conceptual framework, the UTAUT diagram.

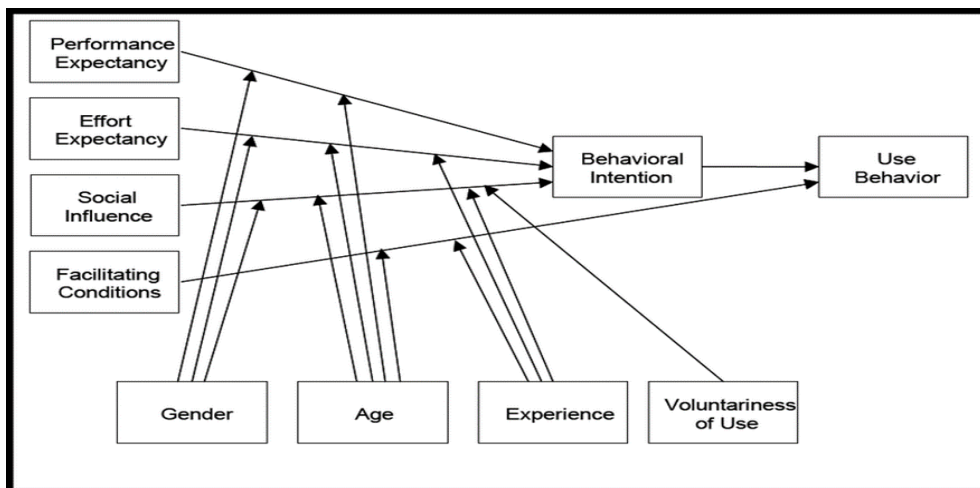


Figure 1. UTAUT Model

Source: Adopted from Venkatesh (2011) [19]

## Novelty of the Work

This study contributes to the existing body of knowledge by focusing on the specific context of Nairobi, Kenya, a rapidly growing urban

centre with unique healthcare challenges. While previous research has explored telemedicine adoption in various settings, this study provides a localised perspective,

considering the socio-economic and infrastructural factors unique to Nairobi. Furthermore, by identifying service provision gaps, the study offers practical insights and recommendations to inform policymakers, healthcare providers, and technology developers in enhancing telemedicine adoption in Nairobi and similar contexts.

## **Materials and Methods**

### **Description of the Site**

The study employed a cross-sectional design and was conducted in Nairobi, Kenya, focusing on urban and suburban healthcare facilities implementing voice and video-based (VVB) telemedicine consultation services. These services included public hospitals, private health facilities, and telemedicine providers. Nairobi, with its diverse demographic composition and varying levels of healthcare infrastructure, provided a suitable context for evaluating the effectiveness and scalability of these telemedicine services.

### **Study Population**

The study targeted telemedicine service providers and users involved in delivering care and treatment services for patients in Nairobi. The urban setting was chosen due to VVB telemedicine consultation services. The target population comprises healthcare professionals in telemedicine service delivery, including doctors, nurses, occupational therapists, psychologists, program managers, and Ministry of Health officials.

### **Sampling Technique**

The medical service providers were purposively sampled using staff registers and lists from relevant agencies and institutions involved in telemedicine service delivery. This

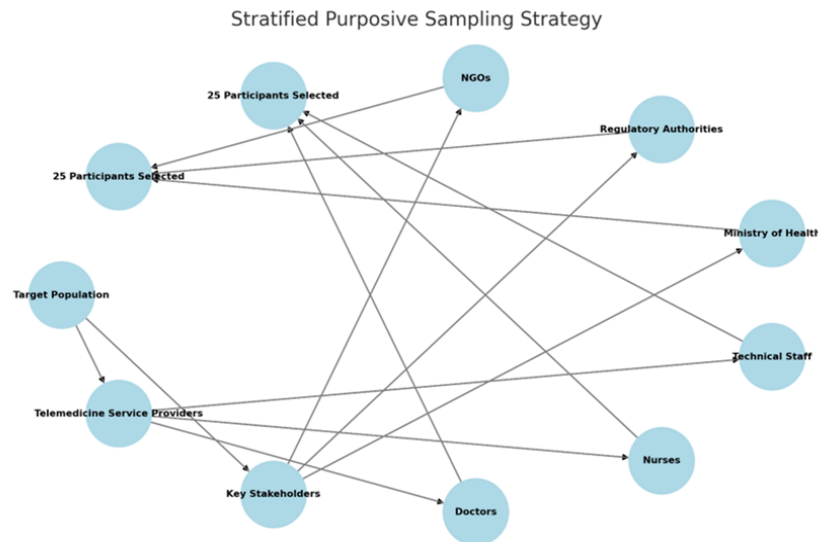
targeted sampling approach ensured that participants were specifically chosen based on their roles and experience with telemedicine, providing a focused and relevant sample for analysing the effectiveness and challenges of telemedicine services. This approach ensured that participants were directly involved in delivering, designing, or implementing telemedicine services. The gatekeepers of such institutions were identified, and necessary permissions were sought for the research. A web-based survey was sent to the email addresses of the selected participants.

#### **Sampling Steps:**

1. Identify the target population from each stratum using staff lists and institutional registers.
2. Application of inclusion and exclusion criteria to identify eligible participants.
3. Participants were purposively selected from each identified stratum, ensuring a balance of professional roles and gender. A total of 50 respondents were selected, comprising:
  - 12 doctors,
  - 12 nurses,
  - 12 pharmacists,
  - 14 other healthcare professionals involved in telemedicine services.

By purposively selecting participants from each group, the study ensured that participants had relevant telemedicine experience while maintaining diversity in roles and gender balance; purposive sampling enhances the credibility of the findings rather than their representativeness (Onwuegbuzie & Collins, 2007).

Below is a diagrammatic display of the sampling strategy (*Image generated via Python Code*).



**Figure 2.** Stratified Purposive Sampling Strategy  
*Source: Author (2025) modelled using Python software*

## Participant Recruitment

The recruitment strategy entailed dividing the service providers into two strata or subgroups.

1. Telemedicine service providers include doctors, nurses and other technical staff.
2. Key stakeholders involved in the telemedicine service delivery from the Ministry of Health, regulatory authorities, NGOs

Participants were recruited based on predetermined inclusion and exclusion criteria. The consent process preceded recruitment, with information sheets detailing the study's purpose, expectations, and potential risks. Participants were informed that their participation was voluntary and that they could withdraw anytime without affecting their services or employment.

### Inclusion Criteria

Involvement in telemedicine service delivery in the past six months, aged 18-65 years, provided signed consent.

### Exclusion Criteria

No record of working in telemedicine in the past six months, refusal to provide consent.

## Data Collection Procedure and Tools

This study used quantitative data.

### Questionnaire Design

The Unified Theory of Acceptance and Use of Technology (UTAUT) framework guided the design of the data collection tools. The constructs of performance expectancy, effort expectancy, social influence, and facilitating conditions were used to structure the questions. Closed-ended questions were used to maintain consistency and allow for easy analysis of the responses where the questions were rated on a 5-point Likert scale (Strongly Disagree (1) to Strongly Agree (5)). Performance Expectancy construct measured the extent to which healthcare professionals believed that using smartphone-based telemedicine services would improve their work performance. The effort Expectancy construct measured how easily healthcare professionals found the telemedicine services to use. The social Influence construct examined the extent to which healthcare professionals felt that their peers or superiors encouraged or supported their use of telemedicine. Lastly, the Facilitating Conditions construct assessed whether healthcare professionals had the necessary infrastructure, resources, and knowledge to

effectively use telemedicine services. The survey was administered online using Survey Monkey.

### Description of Experiments Done

The study investigated healthcare providers' intentions to adopt smartphone-based consultation services and identified service provision gaps in Nairobi, Kenya. The quantitative survey assessed healthcare providers' perspectives.

### Description of Statistical Methods Used

Quantitative data were analysed using descriptive and inferential statistics. Chi-square tests and regression analyses were conducted to identify factors influencing healthcare providers' intentions to adopt smartphone-based consultation services. The study was performed using statistical software such as SPSS.

## Findings

### Descriptive Analysis

Regarding the descriptive analysis of physician-related factors, most respondents (58.3%) were between 35-44 years, and 60.4% were male. Regarding professional experience, the majority of the physicians, 38 (79.2%), had work experience of 6-10 years and the rest (20.8%) had work experience of not more than five years. Regarding the type of training, 29 respondents (60.4%) had undergone job training concerning telemedicine, 20.8% had attended Workshops/seminars, while the rest (18.8%) had pursued formal courses to receive telemedicine training. In the view of the duration the physicians have been in the job providing telemedicine services, 20 of the respondents (41.7%) have provided 1-2 years, 37.5% have provided between 3-5 years, while the rest (20.8%) have provided the service less than one year. Physician characteristics are presented in detail in Table 1, offering a comprehensive overview of their various attributes and roles.

**Table 1.** Demographic Factors

<b>Demographic factors</b>	<b><i>n</i></b>	<b>%</b>
<b>Gender</b>		
Male	29	60.4
Female	19	39.6
<b>Age</b>		
25-34 years	20	41.7
35-44 years	28	58.3
<b>Professional experience</b>		
0-5 years	10	20.8
6-10 years	38	79.2
<b>Type of training</b>		
On job training	29	60.4
Formal course	9	18.8
Workshops/seminars	10	20.8
<b>Duration of providing telemedicine services</b>		
Less than a year	10	20.8
1-2 years	20	41.7
3-5 years	18	37.5

### Performance Expectancy (PE)

The study provided results of Chi-Square tests assessing the influence of age, gender, experience, and voluntary usage on Performance Expectancy (PE) in the context of video and voice-based consultation services. The analysis examines the association between these moderating factors and PE to understand their impact on healthcare providers' expectations of behaviour intentions. The Chi-

Square test results indicate that all moderating factors significantly modulate Performance Expectancy (PE) with p-values of 0.000, which are less than 0.05. The Cramer's V values suggest strong associations: age (0.764), gender (1.000), experience (0.707), and voluntary usage (0.816). This implies that these factors significantly influence healthcare providers' performance expectations, with gender showing the strongest association.

**Table 2.** The Moderating Influence of Age, Gender, Experience, and Voluntary Usage on Performance Expectancy

Moderating Factor	Pearson Chi-Square Value	df	Asymptotic Significance (p-value)	Cramer's V	Interpretation (p < 0.05)
Age	29.167 <sup>a</sup>	3	.000	.764	Modulated
Gender	50.000 <sup>a</sup>	3	.000	1.000	Modulated
Experience	50.000 <sup>a</sup>	6	.000	.707	Modulated
Voluntary usage	66.667 <sup>a</sup>	6	.000	.816	Modulated

### Effort Expectancy (EE)

The Chi-Square test results reveal significant modulation of Effort Expectancy (EE) by all moderating factors, with p-values of 0.000, indicating high statistical significance. The Cramer's V values are age (0.764), gender (0.764), experience (1.000), and voluntary

usage (1.000), reflecting solid associations. These findings suggest that healthcare providers' perceptions of the effort needed to use video and voice-based consultation services are significantly affected, with experience and voluntary usage showing the strongest associations.

**Table 3.** The Moderating Influence of Age, Gender, Experience, and Voluntary Usage on Effort Expectancy

Moderating Factor	Pearson Chi-Square Value	df	Asymptotic Significance (p-value)	Cramer's V	Interpretation (p < 0.05)
Age	29.167 <sup>a</sup>	3	.000	.764	Modulated
Gender	29.167 <sup>a</sup>	3	.000	.764	Modulated
Experience	100.000 <sup>a</sup>	6	.000	1.000	Modulated
Voluntary usage	100.000 <sup>a</sup>	6	.000	1.000	Modulated

### Social Influence (SI)

The Chi-Square test results indicate significant modulation of Social Influence (SI) by all moderating factors, with p-values of 0.000. The Cramer's V values indicate strong associations: age (0.764), gender (1.000),

experience (0.866), and voluntary usage (1.000). These results suggest that these factors significantly influence social pressures to adopt video and voice-based consultation services, with gender and voluntary usage showing the strongest associations.

**Table 4.** The Moderating Influence of Age, Gender, Experience, and Voluntary Usage on Social Influence

Moderating Factor	Pearson Chi-Square Value	df	Asymptotic Significance (p-value)	Cramer's V	Interpretation (p < 0.05)
Age	29.167 <sup>a</sup>	3	.000	.764	Modulated
Gender	50.000 <sup>a</sup>	3	.000	1.000	Modulated
Experience	75.000 <sup>a</sup>	6	.000	.866	Modulated
Voluntary usage	100.000 <sup>a</sup>	6	.000	1.000	Modulated

### Facilitating Conditions (FC)

The Chi-Square test results show that all moderating factors significantly modulate Facilitating Conditions (FC), with p-values of 0.000. The Cramer's V values are age (1.000), gender (0.764), experience (0.866), and

voluntary usage (1.000), indicating solid associations. These findings imply that these factors significantly influence the resources and support available for video and voice-based consultation services, with age and voluntary usage showing the strongest associations.

**Table 5.** The Moderating Influence of Age, Gender, Experience, and Voluntary Usage on Facilitating Conditions

Moderating Factor	Pearson Chi-Square Value	df	Asymptotic Significance (p-value)	Cramer's V	Interpretation (p < 0.05)
Age	50.000 <sup>a</sup>	3	.000	1.000	Modulated
Gender	29.167 <sup>a</sup>	3	.000	.764	Modulated
Experience	75.000 <sup>a</sup>	6	.000	.866	Modulated
Voluntary usage	100.000 <sup>a</sup>	6	.000	1.000	Modulated

### Predictors of Behavioural Intentions

**Table 6.** Predictors of Behavioural Intentions

Coefficients						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	3.750	.000		18.750	.000
	Age	-1.625	.000	-0.373	-3.611	0.001
	Gender	-.375	.000	-0.214	-2.500	0.015
	Experience	1.375	.000	0.456	4.583	0.000
	Voluntary usage	-0.125	.000	-0.153	-1.250	0.213
	Performance expectancy	0.175	.001	0.209	2.500	0.015
	Effort expectancy	-1.668	.001	0.393	-4.170	0.000
	Social influence	1.299	.001	0.499	3.711	0.001
	Facilitating conditions	-.070	.001	-0.081	-2.000	0.048

a. Dependent Variable: Behavioural intentions



The regression analysis results show that several factors significantly impact Behavioral Intentions. The constant ( $B = 3.750$ ) indicates the baseline level of Behavioral Intentions when all independent variables are zero. Age significantly negatively affects Behavioral Intentions ( $B = -1.625$ ,  $Beta = -0.373$ ,  $t = -3.611$ ,  $Sig. = 0.001$ ), suggesting that the intention to adopt smartphone-based consultations decreases as age increases. Gender also negatively impacts Behavioral Intentions ( $B = -0.375$ ,  $Beta = -0.214$ ,  $t = -2.500$ ,  $Sig. = 0.015$ ), indicating that males are less likely to adopt these technologies compared to females. Experience in telemedicine positively influences Behavioral Intentions ( $B = 1.375$ ,  $Beta = 0.456$ ,  $t = 4.583$ ,  $Sig. = 0.000$ ), meaning that more experienced providers are more likely to adopt these consultations. Voluntary Usage shows a slight negative effect ( $B = -0.125$ ,  $Beta = -0.153$ ,  $t = -1.250$ ,  $Sig. = 0.213$ ), indicating that providers who use telemedicine services voluntarily have a marginally lower intention to adopt compared to those who use it less voluntarily. Performance Expectancy positively affects Behavioral Intentions ( $B = 0.175$ ,  $Beta = 0.209$ ,  $t = 2.500$ ,  $Sig. = 0.015$ ), suggesting that providers believe that using telemedicine services will enhance their performance. In contrast, Effort Expectancy has a robust negative impact ( $B = -1.668$ ,  $Beta = -0.393$ ,  $t = -4.170$ ,  $Sig. = 0.000$ ), implying that the perceived difficulty of using these services discourages adoption. Social Influence is positively associated with Behavioral Intentions ( $B = 1.299$ ,  $Beta = 0.499$ ,  $t = 3.711$ ,  $Sig. = 0.001$ ), indicating that healthcare professionals are more likely to adopt smartphone-based consultations if they perceive support from their peers and the healthcare community. Conversely, Facilitating Conditions show a slight negative effect ( $B = -0.070$ ,  $Beta = -0.081$ ,  $t = -2.000$ ,  $Sig. = 0.048$ ), suggesting that limitations in the resources and support for telemedicine use may hinder the

intention to adopt these services. All the predictors are statistically significant, as indicated by their respective p-values.

## Discussion of Results and Findings

Our study aimed to identify the factors associated with patients, physicians, and technology influencing their use by exploring the adoption and uptake of smartphone-based voice and video consultations for outpatient care. Utilising relevant theories and frameworks from the UTAUT, the research highlighted various determinants that shape the behavioural intention to engage with these consultations, as detailed in the following sections.

### Performance Expectancy (PE)

(H0): *The UTAUT variables of performance expectancy are not modulated by age and gender, experience, and voluntary usage.*

The study results revealed significant insights into the factors influencing performance expectancy (PE) and their subsequent impact on the behavioural intentions of healthcare providers to adopt video and voice-based consultation services. Chi-square tests indicate that age, gender, experience, and voluntary usage significantly modulate PE, with p-values of 0.000 for all moderating factors, demonstrating statistical significance ( $p < 0.05$ ). The strength of these associations is indicated by Cramer's V values, with gender (1.000) showing the strongest association, followed by voluntary usage (0.816), age (0.764), and experience (0.707).

These findings support rejecting the null hypothesis (H0), as the mentioned moderating factors influence PE. Furthermore, the hierarchical regression analysis reinforces these results. Performance expectancy, along with age, gender, experience, and voluntary usage, significantly impacts behavioural intentions, with PE showing a positive standardised coefficient ( $\beta = .209$ ,  $p = .015$ ). This implies that as healthcare providers' performance

expectations increase, so does their behavioural intention to use video and voice-based consultation services.

This foundational study of Venkatesh et al. aligns with our findings, which indicate that age and gender significantly modulate PE in the context of healthcare providers adopting telemedicine services [19]. Research done by Williams et al. investigated the voluntary use of technology and its impact on performance expectancy [20]. They found that when technology use is voluntary, users exhibit higher performance expectancy and stronger behavioural intentions to use the technology. This aligns with our study's findings, which show significant modulation of PE by voluntary usage.

### **Effort expectancy**

*H0): The UTAUT variables of effort expectancy are not modulated by age and gender, experience, and voluntary usage.*

The Chi-Square test results indicate that Effort Expectancy (EE) is significantly modulated by age, gender, experience, and voluntary usage, with p-values of 0.000 for all factors, demonstrating high statistical significance ( $p < 0.05$ ). The strength of these associations is further highlighted by Cramer's V values: age (0.764), gender (0.764), experience (1.000), and voluntary usage (1.000). These findings suggest that healthcare providers' perceptions of the effort required to use video and voice-based consultation services are substantially influenced by these moderating factors, with experience and voluntary usage showing the strongest associations.

These results lead us to reject the null hypothesis (H0), which posits that the UTAUT variables of effort expectancy are not modulated by age, gender, experience, and voluntary usage. The significant modulation observed suggests otherwise. The hierarchical regression analysis further supports these findings, where effort expectancy shows a

substantial negative standardized coefficient ( $\beta = -1.393$ ,  $p = .000$ ). This indicates that as healthcare providers perceive the effort required to use these services to be lower, their behavioural intention to adopt video and voice-based consultations increases.

To support our findings, a study by Chao et al. found that younger users and females generally perceive technology as more effortless to use [21]. This aligns with our findings of significant modulation of EE by these factors among healthcare providers. Al-Marroof et al. found that voluntary use of technology significantly impacts effort expectancy [22]. Users who voluntarily choose to use technology often find it easier to use, consistent with our results.

### **Social Influence**

*H0): The UTAUT social influence variables are not modulated by age and gender, experience, and voluntary usage.*

The Chi-Square test results reveal that Social Influence (SI) is significantly modulated by age, gender, experience, and voluntary usage, with all p-values at 0.000, demonstrating high statistical significance ( $p < 0.05$ ). The Cramer's V values further indicate strong associations with these factors: age (0.764), gender (1.000), experience (0.866), and voluntary usage (1.000). These findings suggest that these moderating factors considerably influence social pressures to adopt video and voice-based consultation services, with gender and voluntary usage having the most robust associations.

Given these results, we reject the null hypothesis (H0), which states that the UTAUT variables of social influence are not modulated by age, gender, experience, and voluntary usage. The significant modulation observed across all factors indicates that social influence is critical in healthcare providers' behavioural intentions to adopt telemedicine services.

Further support is provided by the hierarchical regression analysis, where social

influence has a substantial positive standardised coefficient ( $\beta = 1.699$ ,  $p = .001$ ). This indicates that as the social pressure to use video and voice-based consultation services increases, so does the healthcare providers' behavioural intention to adopt these technologies.

In a similar vein, Dwivedi et al. found that social influence significantly affects technology adoption across different age groups and genders [23]. Younger users and females are often more influenced by social factors in their decision to adopt new technologies. Ly and Ly, on the other hand, found that voluntary usage significantly enhances the impact of social influence on technology adoption [24]. When users voluntarily adopt technology, social influence becomes critical in their decision-making process.

### **Facilitating Conditions**

*H0): The UTAUT variables of facilitating conditions are not modulated by age and gender, experience, and voluntary usage.*

The Chi-Square test results demonstrate that Facilitating Conditions (FC) are significantly modulated by age, gender, experience, and voluntary usage, with all p-values being 0.000, which is well below the threshold of 0.05 for statistical significance. The Cramer's V values indicate strong associations for age (1.000), gender (0.764), experience (0.866), and voluntary usage (1.000). These findings imply that the resources and support available for video and voice-based consultation services are significantly influenced by these moderating factors, with age and voluntary usage showing the strongest associations.

Based on these results, we reject the null hypothesis (H0), which posits that the UTAUT variables of facilitating conditions are not modulated by age, gender, experience, and voluntary usage. The significant modulation across all factors suggests that facilitating conditions are crucial in shaping healthcare

providers' behavioural intentions to adopt telemedicine services.

The hierarchical regression analysis further supports these findings, indicating a notable impact of facilitating conditions on behavioural intentions. Although the standardized coefficient for facilitating conditions ( $\beta = -0.081$ ,  $p = .048$ ) is negative, it highlights the intricate relationship between perceived facilitating conditions and behavioural intentions. This suggests that specific available resources and support systems might need enhancement to positively influence adoption.

To support our findings, Venkatesh et al. found that facilitating conditions significantly affect technology adoption across different age groups and genders [19]. Older users and females often place higher importance on the availability of resources and support when adopting new technologies. Similarly, Oliveira et al. indicated that users with more experience depend less on facilitating conditions when adopting new technology [25]. This finding is consistent with our study, highlighting that while experience moderates FC, it is not as strong as age or voluntary usage. Scherer et al., on the other, confirmed that voluntary usage significantly enhances the impact of facilitating conditions on technology adoption [26]. When users voluntarily adopt technology, the available resources and support become critical factors in their decision-making process.

### **Limitations Exploration**

The study's outcomes may be influenced by several potential biases. One significant concern is selection bias, stemming from the purposive sampling method used to select healthcare professionals. While this approach aimed to target individuals with relevant experience in telemedicine, it may not represent the broader population of healthcare providers, leading to skewed results. Additionally, the relatively small sample size limited the generalizability of the findings and increased the likelihood of Type I and Type II errors.

Furthermore, multicollinearity issues among the independent variables might obscure the unique contributions of each predictor, complicating the interpretation of their individual effects on Behavioral Intentions.

Moreover, the research faced infrastructure challenges and further elaboration on their potential impact on the study's findings is warranted. Participants may have been drawn from institutions with varying levels of telemedicine support, potentially affecting their experiences and perceptions. If the sampled professionals worked in environments with limited technological infrastructure or inconsistent access to digital platforms, this could skew their attitudes toward smartphone-based consultations. Therefore, these challenges might not only influence individual responses but also limit the study's ability to reflect the experiences of a more diverse range of telemedicine users. Understanding these limitations is essential for contextualizing the findings and recognizing the complexities inherent in telemedicine adoption within the healthcare sector.

## **Conclusion**

The research highlighted the significant roles of Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions in the adoption of smartphone-based voice and video consultations for outpatient care. The influence of age, gender, experience, and voluntary usage on these UTAUT variables highlights their importance in shaping healthcare providers' behavioural intentions. The study findings, which align with existing literature, suggest that perceived performance benefits and ease of use, along with social pressures and facilitating conditions, play critical roles in the adoption decision-making process. While enhancing these elements may lead to improved integration and utilization of telemedicine

services, it is important to acknowledge the study's scope and limitations, as the conclusions are based on a relatively small and localized sample. For future research, pilot projects could be scaled to add depth to the findings. Moreover, exploring the necessary infrastructure, ongoing training, and support mechanisms will be vital for ensuring that telemedicine solutions are not only effectively implemented but also maintained and expanded in the long term. These considerations are crucial for policymakers, healthcare providers, and technology developers aiming to foster broader acceptance and effectiveness of telemedicine in Nairobi and similar contexts, ultimately improving healthcare delivery.

## **Conflict of Interest Statement**

I hereby declare that I have no conflict of interest regarding the publication of the article titled: "Overcoming Barriers to Telehealth: A Study on Smartphone Consultation Services in Nairobi Using the UTAUT Framework".

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