

## A CROSS-SECTIONAL STUDY ON MOBILE TELEHEALTH SYSTEMS AND INFORMATION ACCESSIBILITY AT KITAGATA HOSPITAL IN SHEEMA DISTRICT.

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Page | 1 **ABSTRACT**

### Background

Mobile telehealth systems are increasingly transforming healthcare delivery, improving accessibility for patients, and enhancing efficiency among healthcare providers. This study explored the current landscape of mobile telehealth system usage at Kitagata Hospital in Sheema district southwestern Uganda.

### Methods

The cross-sectional research design was adopted. The study population included patients and Physicians in Kitagata Hospital while a sample size of 250 participated in the study. Questionnaires and in-depth interviews were used to collect data. The study employed both primary and secondary data. Descriptive statistics and regression technique (model summary) analysis were done to examine the percentage effect of mobile telehealth systems on information accessibility at Kitagata Hospital to analyze quantitative data while qualitative data was narratively analyzed. To cater for conflict of interest, familiarized with the institutions' policies to minimize the chances of occurrence of conflict of interest, a research assistant was recruited to assist in data collection where the researcher had a conflict of interest.

### Results

The combined total of 63.6% suggests that telehealth is becoming a routine part of healthcare delivery in this setting. Overall, results demonstrated that mobile telehealth systems significantly correlate with enhanced information accessibility at Kitagata Hospital, explaining a notable portion of the variability in this area. Also, a moderate level of adoption, with significant benefits reported in patient satisfaction and physician time management.

### Conclusion

Whereas evidence shows that the use of telehealth systems increases efficiency and quality of healthcare, inadequate infrastructure development and insufficient capacity building among health workers inhibit the adoption and usage of telehealth.

### Recommendation

More investment should be made in setting up appropriate infrastructure and building the capacity of healthcare workers to boost telehealth utilization.

**Keywords:** Mobile telehealth, Information accessibility, Patient outcomes, Physician efficiency, Telehealth adoption

**Submitted:** 2025-01-17 **Accepted:** 2025-01-29 **Published:** 2025-03-01

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### INTRODUCTION

Mobile telehealth systems refer to the use of mobile devices, such as smartphones, tablets, and wearable technologies, to facilitate healthcare delivery and communication between healthcare providers and patients. These systems leverage the portability and connectivity of mobile devices to enable remote monitoring, diagnosis, and treatment of patients, as

well as to facilitate the exchange of health-related information (Sinha and Gupta, 2020). Through mobile telehealth, healthcare professionals can connect with patients in real time, allowing for consultations, diagnoses, monitoring of medical conditions, and treatment planning without the need for an in-person visit.

This technology has revolutionized healthcare by improving access to medical care, particularly in rural or underserved

areas (Lewis and Hsieh, 2021). Some key components of mobile telehealth include telemedicine, which involves remote clinical services such as virtual appointments with doctors, and remote patient monitoring, which enables healthcare providers to track patients' crucial indicators and personal attributes from a distant place. Mobile telehealth also encompasses features such as secure messaging, video conferencing, and digital health tools that empower patients to take charge of their health and well-being. Thus mobile telehealth offers convenience, efficiency, and increased accessibility to healthcare services. It has the potential to enhance patient outcomes, reduce healthcare costs, and improve overall quality of care.

Mobile telehealth systems utilize mobile technology to provide healthcare services, enabling patients to access medical expertise and resources remotely. The global COVID-19 pandemic has accelerated the adoption of telehealth solutions, highlighting their potential to reduce barriers to healthcare access (Gonzalez et al., 2021). Kitagata Hospital in Sheema, Uganda, presents a unique case to explore the implications of mobile telehealth systems in a developing country context. Previous studies have indicated that telehealth can improve healthcare delivery, but challenges such as technological infrastructure and user engagement persist (Bashshur et al., 2020). This study aims to elucidate mobile telehealth's current usage and effects at Kitagata Hospital.

## Objective

The main objective of the study was to examine the effectiveness of Mobile Telehealth Systems on information accessibility at Kitagata Hospital in Sheema district.

## Specific objective

The specific objective was to assess the current level of mobile telehealth system usage among patients and physicians to evaluate the availability and adoption of mobile telehealth systems by patients and physicians and to measure the impact of mobile telehealth systems on patient outcomes and physician efficiency at Kitagata Hospital.

## MATERIALS AND METHODS

### Study Design

In this study, the cross-sectional research design was adopted. This design helped the researcher in determining the strength and direction of associations between variables and allowed the researcher to measure the degree of correlation between variables and understand if they were positively or negatively associated with each other.; And

thereafter, the researcher summarized, presented, and interpreted the data collected which formed the basis for making conclusions and recommendations (Orodho, 2015).

### Study Setting

The study was carried out at Kitagata Hospital. Kitagata Hospital is located in the rural setup of Sheema District with a bed capacity of 100 patients and serves over 12,409 general OPD patients (MOF, 2019) from its catchment area including neighboring districts of Rukungiri, Buhweju, Mitooma, Bushenyi. The hospital is made up of several outpatient clinics and wards like HIV, Maternal and Child Health Unit, and Medical. Kitagata Hospital in Uganda represents a microcosm of the larger challenges faced in the country. Previous research conducted at this facility revealed that inefficiencies in patient flow result in delays and impact the quality of care experienced by patients (Okello et al., 2023). Strategies such as training staff in triage and implementing electronic health records have been recommended to improve flow and enhance the overall quality of care for the patients at the hospital (Okello et al., 2023).

### Participants

These included the patients and Physicians in Kitagata Hospital. Physicians were selected using purposive sampling because they were informants who provided expert information needed for this study. Patients were randomly selected from attending individuals, while physicians were selected based on active engagement in telehealth services. The surveys were administered via paper formats, ensuring inclusivity for individuals with varying technological access.

### Inclusion

All physicians and patients present on the days of data collection will be included in the study.

### Exclusion

All physicians and patients absent on the days of data collection will be excluded from the study.

### Bias management

The researcher defined and adhered to specific criteria for including and excluding participants from the study. This helped to ensure that the sample was appropriate for the population being studied ensuring less bias on the findings.

## Data Source

### Primary Data

Primary data was collected from patients and Physicians in Kitagata Hospital using questionnaires and in-depth interviews.

### Secondary

Secondary data was obtained from written sources in Kitagata Hospital such as memos, handouts, flyers, and annual reports to get an understanding of the operations of the Hospital.

### Sample Size

These included physicians and patients distributed as 200 patients and 50 physicians at Kitagata Hospital. This was determined using Krejcie & Morgan (1970).

### Data collection methods

A structured questionnaire was developed and distributed to 200 patients and 50 physicians at Kitagata Hospital. The survey included sections on demographic information, frequency of telehealth usage, satisfaction levels, and perceived barriers (internet access, user training). In-depth interviews were conducted with a purposive sample of 15 patients and 15 physicians to gain insights into their experiences and perspectives regarding mobile telehealth systems. The thematic analysis was applied to identify key themes and patterns in qualitative data.

## Data Analysis

### Quantitative data analysis

Descriptive statistics were used to interpret the survey results, calculating frequencies, and percentage scores.

Descriptive statistics were used as they provide a concise summary of the main features of a dataset, making it easier for the researcher to understand and interpret the data (Schmidt & Kohlmann, 2008). Regression technique (model summary) analysis was done to examine the percentage effect of mobile telehealth systems on information accessibility at Kitagata Hospital.

### Qualitative data analysis

Qualitative data were also presented using direct quotes from the respondents. With narrative analysis, the researcher used verbatim quotes to express respondents' views to ensure the representation of the participants' voices Hsieh (2005). The researcher read through the narratives multiple times to understand the participants' views linking them to related themes. Thereafter, the researcher revisited data to ensure that the themes portray participants' views. The researcher interpreted the findings based on the participants' narratives to understand the content and meaning behind it. Finally, findings were presented using key points from the participants' responses and their contribution to the existing literature.

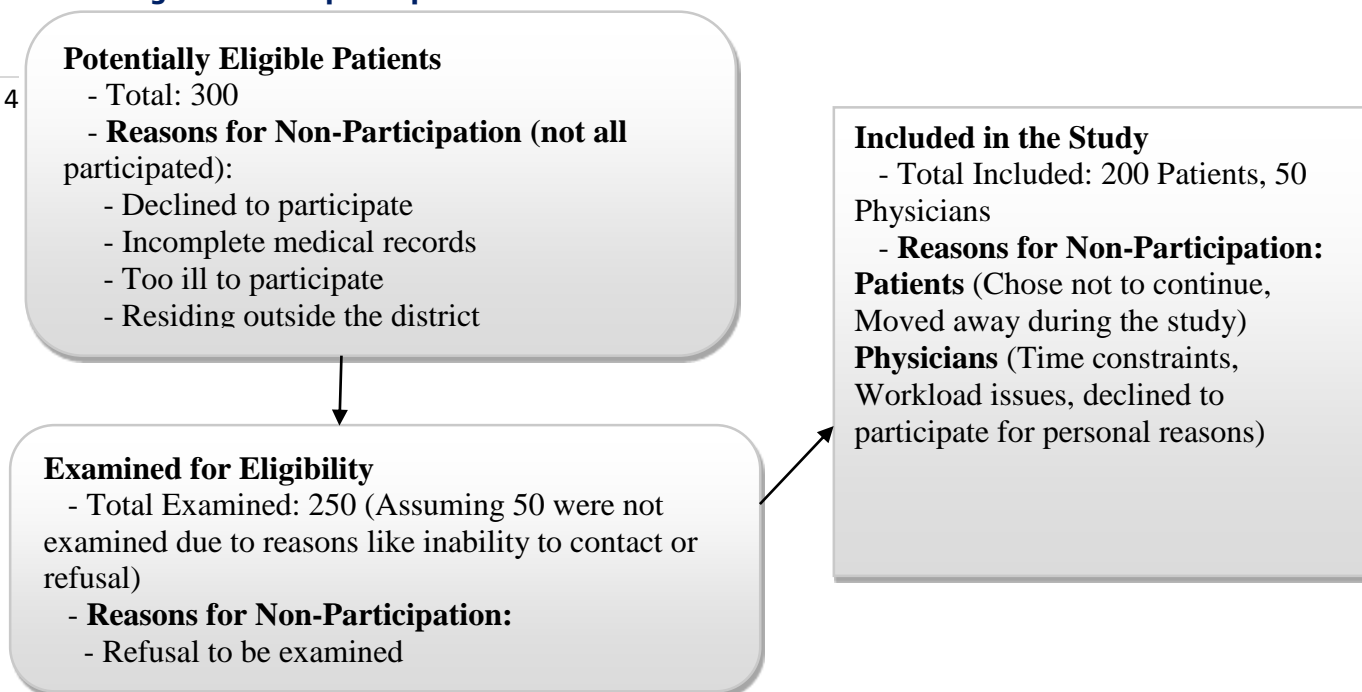
### Ethical Considerations

The researcher assured the participants of the total confidentiality of their responses. Participants were enrolled in the study after obtaining their formal consent. The researcher made it clear that participants had a right to withdraw from the study without penalty or punishment before or during data collection. The names of participants were not mentioned anywhere during report writing for anonymity. The researcher tried as much as possible to be transparent and uphold integrity to cater to beneficence and maleficence. To cater for conflict of interest, the researcher familiarized with the institutions' policies minimized the chances of occurrence of conflict of interest. A research assistant was recruited to assist in data collection when the researcher had a conflict of interest.

## RESULTS

### Flow diagram for the participants

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**Table 1: Descriptive statistics on mobile telehealth systems at Kitagata Hospital in Sheema district**

Variable(s)	Response Option	Patients (n=200)	Physicians (n=50)	Total Respondents
Frequency of Mobile Telehealth Usage	Regular use	120 (60%)	33 (78%)	159 (63.6%)
	Occasionally use	50 (25%)	8 (16%)	58 (23.2%)
	Never use			
Satisfaction with Telehealth Services	Very satisfied	90 (45%)	35 (70%)	125 (50%)
	Satisfied	50 (25%)	4(8%)	54 (21.6%)
	Neutral	35(17.5%)	6 (12%)	41(16.4%)
	Dissatisfied	15(7.5%)	3(6%)	18 (7.2%)
Perceived Impact on Time Management for Physicians	Improved	-	35(70%)	35(70%)
	Neutral	-	10 (20%)	10 (20%)
	No impact	-	5(10%)	5(10%)
Identified Barriers to Telehealth Use	Limited internet connectivity	90 (45%)	20(40%)	110(44%)
	Lack of training	60(30%)	10(20%)	70(28%)
	Device accessibility	30(15%)	10(20%)	40(16%)
	Technical support	20(10%)	5(10%)	25(10%)
Importance of Telehealth	Very important	120(60%)	40(80%)	160(64%)
	Important	40(20%)	5(10%)	45(18%)
	Not important	40(20%)	5(10%)	45(18%)

## Summary of Findings

### Usage

A notable 60% of patients and 78% of physicians indicated regular usage of telehealth services. The combined total of 63.6% suggests that telehealth is becoming a routine part of healthcare delivery in this setting.

### Satisfaction

70% of physicians reported being very satisfied with telehealth, while 45% of patients shared the same sentiment. This highlights that while there is satisfaction, there are also significant portions of both groups that may have reservations about the effectiveness or ease of the telehealth services.

Improved efficiency: 70% of physicians felt that telehealth improved their time management in consultations. This result is crucial as it reflects positively on the potential for telehealth to optimize physician workflow.

### Barriers

The two main barriers identified were limited internet connectivity (44%) and a lack of training (28%). This suggests that enhancing training programs could improve

user confidence and service engagement, highlights the need for ensuring that all users have the necessary technology to participate in telehealth, and underscores the importance of providing ongoing assistance to users to facilitate smoother experiences.

### Value

A significant 64% of patients and physicians combined deemed telehealth to be "very important". This divide highlights differing perspectives on the relevance of telehealth in their healthcare experiences.

In general, the findings suggest that mobile telehealth systems are well-received at Kitagata Hospital, particularly among physicians, who report higher usage and satisfaction rates. However, barriers such as internet connectivity and training need to be addressed to further enhance the effectiveness of these services. The perceived importance of telehealth among both patients and physicians indicates a positive trend toward its continued use in the healthcare landscape.

### Regression Analysis (Model Summary)

This was run to examine the percentage effect of mobile telehealth systems on information accessibility and the results that emerged are presented in Table 2;

**Table 2: Model Summary results for mobile telehealth systems on information accessibility at Kitagata Hospital in Sheema district**

Regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615 <sup>a</sup>	.378	.375	5.95188

a. Predictors: (Constant), mobile telehealth systems

Source: SPSS 26.0

The model summary Table 2, reveals a correlation coefficient (R), using the predictor; mobile telehealth systems that was at .615a, adjusted R squared of .375, and Standard error of estimate value of 5.95188. Details are explained as follows;

### Correlation Coefficient (R = 0.615)

The correlation coefficient of 0.615 indicates a moderate to strong positive relationship between mobile telehealth systems and information accessibility. This suggests that as the use of mobile telehealth systems increases, the

accessibility of information also tends to improve. This is a promising finding, highlighting the potential of mobile telehealth to enhance information access in a healthcare setting.

### R Square (R<sup>2</sup> = 0.378)

The R Square value of 0.378 indicates that approximately 37.8% of the variability in information accessibility can be explained by the mobile telehealth systems in the model. This means that nearly 38% of the differences in how accessible information is perceived can be accounted for by

the implementation and effectiveness of these telehealth systems. This is a significant portion, suggesting that mobile telehealth does play an important role in improving information accessibility.

### Adjusted R Square (Adjusted R<sup>2</sup> = 0.375)

The adjusted R Square value is slightly lower at 0.375, which accounts for the number of predictors in the model. This value indicates that even after adjusting for the number of predictors, the model still explains about 37.5% of the variance in information accessibility. This reinforces the finding that mobile telehealth systems are a significant predictor of information accessibility while also suggesting that the model is robust enough to account for other variables that may influence the outcome.

### Standard Error of the Estimate (5.95188)

The standard error of the estimate is 5.95188, which provides a measure of the accuracy of predictions made by the model. A lower standard error indicates that the model's predictions are closer to the actual observed values. In this context, a standard error of about 5.95 suggests some level of variability in predictions, but it is relatively acceptable considering the complexity of healthcare settings. This means that while the model does provide useful insights, there are still factors affecting information accessibility that are not fully captured by mobile telehealth systems alone.

### Residual Variability (38.5%)

The remaining percentage of 38.5% indicates that there are other factors, beyond mobile telehealth systems, that contribute to the variations in information accessibility. These could include factors such as patient literacy, staff training, technological infrastructure, organizational policies, and other external influences that were not included in this model. This highlights the need for further research to identify and understand these additional factors that impact information accessibility in the healthcare context. Thus, the model effectively demonstrates that mobile telehealth systems significantly correlate with enhanced information accessibility at Kitagata Hospital, explaining a notable portion of the variability in this area. However, there is still a substantial amount of unexplained variance, suggesting that other elements must also be considered to fully understand the dynamics of information accessibility in telehealth. This insight can guide future efforts to enhance telehealth implementation and address the factors influencing information accessibility in healthcare settings.

## Qualitative Results

Thematic analysis from interviews yielded four main themes;

### Accessibility and usage

61% of Patients appreciated the reduced need for traveling long distances for consultations.

**Patient A1:** "I use the telehealth app almost every week for my follow-ups. It's much easier than having to travel two hours just to see my doctor."

**Patient A2:** "At first, I was skeptical about using telehealth, but now I find myself opting for video calls more frequently than in-person visits. It fits better into my schedule."

**Physician B1:** "We're seeing an increase in telehealth usage. A significant portion of our patient base prefers virtual appointments, especially for routine check-ups."

**Physician B2:** "In the beginning, I wasn't sure how effective telehealth would be, but now I frequently schedule virtual visits throughout my day."

### Communication

Improved direct communication with physicians was frequently highlighted was supported by a combined 58% of patients and physicians.

**Patient A3:** "I can tell my doctor can see more patients now. Our appointments are shorter, but we still cover everything. It feels like a win-win for both of us."

**Patient A4:** "My doctor told me that using telehealth helps him manage his time better. He can keep track of his appointments without the constant back-and-forth of scheduling."

**Physician B3:** "Telehealth has improved my time management. I can handle multiple patients in a shorter amount of time, which allows me to focus on those who need more intensive care."

**Physician B4:** "I appreciate how telehealth streamlines my day. I can move from one appointment to the next without wasting time commuting."

## Technical Barriers

An aggregate of 73% of the respondents (patients and physicians) noted issues related to internet unreliability and the need for more technological literacy especially among patients.

**Patient A5:** "Sometimes my internet connection is so bad that I can't have a clear conversation. It makes me frustrated because I want to talk to my doctor."

**Patient A6:** "I feel comfortable with telehealth, but not everyone in my community has the necessary devices. They miss out on care because of that."

**Physician B5:** "While telehealth is convenient, I still face challenges with patients who lack the necessary technology or have difficulties navigating the platforms."

**Physician B6:** "Sometimes, a patient's situation is complex, and it's hard to convey that effectively over a screen. In-person visits do have their advantages in those cases."

## Satisfaction with Telehealth

A 76% consensus emerged on the benefits from both (patients and physicians), though concerns remained about the overall effectiveness compared to in-person consultations.

**Patient A7:** "Telehealth has been a lifesaver for me. I can get my prescriptions renewed without waiting months for an appointment."

**Patient A8:** "With telehealth, I feel more in control of my health. I can get my questions answered quickly without the hassle of travel."

**Physician B7:** "The value of telehealth is immense; it allows me to reach patients who might otherwise fall through the cracks in the healthcare system."

**Physician B8:** "Telehealth has shown us that patients can engage with their care in ways that suit their lifestyles better. It empowers them to be more proactive about their health."

Qualitative interviews highlighted themes of increased accessibility, convenience, and reduced travel burden. However, barriers such as limited internet connectivity and technological literacy emerged as significant challenges.

## DISCUSSION OF RESULTS

The results indicate a moderate level of telehealth adoption at Kitagata Hospital, aligning with similar findings in other regions where telehealth has gained traction (Koonin et al., 2020). The enhanced patient satisfaction and improved efficiency reported by physicians underscore telehealth's potential benefits, particularly in rural settings where access to healthcare can be limited. The challenges identified, particularly concerning internet access and user training, echo findings in the literature suggesting that adequate infrastructure and education are critical for successful telehealth implementation (Bashshur et al., 2020; Lewis et al., 2021).

Results on satisfaction indicate that 70% of physicians reported being very satisfied with telehealth, while 45% of patients shared the same sentiment. Findings are supported by Sinha et al. (2020) who highlighted that mobile platforms significantly enhance the availability of health services by allowing patients to consult healthcare providers without the need for physical travel. Accessibility is crucial for communities like those in the Sheema district, where geographic and economic barriers may hinder traditional health service delivery.

Results on improved efficiency indicate 70% of physicians felt that telehealth improved their time management in consultations. Findings are in agreement with Green et al. (2021) who say that clarity in communication through mobile platforms leads to improved patient engagement and adherence to treatment plans. The authors noted that telehealth facilitates timely information exchange, thus enhancing overall healthcare delivery.

Regarding barriers, the two main barriers identified were limited internet connectivity (44%) and a lack of training (28%). Findings are in line with Akinyede et al. (2022) who identified common technical issues such as connectivity problems, lack of user-friendly interfaces, and insufficient training for healthcare staff and patients. These barriers can limit the effectiveness of telehealth services, particularly in regions with limited technological infrastructure.

On the issue of value, a significant 64% of patients and physicians combined deemed telehealth to be "very important". Patient satisfaction is a critical indicator of the success of mobile telehealth systems. Findings are supported by Kumar and Singh (2023) who found that user satisfaction was higher among patients who utilized telehealth services for chronic disease management compared to those who relied solely on in-person visits. The provision of timely feedback and ongoing support through mobile applications significantly contributed to this satisfaction.

## CONCLUSION

This study concluded that while mobile telehealth systems are gaining acceptance among patients and physicians at Kitagata Hospital, there remain substantial barriers to full utilization that include limited internet connectivity, lack of training, device accessibility, and technical support, especially among patients. By addressing these challenges, Kitagata Hospital can leverage mobile telehealth systems to further enhance healthcare access and efficiency in the region.

## STUDY LIMITATION(S)

As it took too much time, respondents were only somewhat willing to complete questionnaires. Effort was made to deconstruct each question in the interview guide to make it easier to understand.

## RECOMMENDATIONS

- The hospital should strengthen internet connectivity and mobile network coverage to ensure stable access to telehealth services.
- There is a need to implement regular training sessions for both healthcare providers and patients to improve technological literacy and confidence in using telehealth tools.
- There is a need to establish a feedback mechanism to continuously assess the telehealth service's effectiveness and user satisfaction, allowing for adjustments to address emerging challenges.

## SOURCE OF FUNDING

There was no any kind of external funding as the study was wholly financed by the researcher from his savings.

## CONFLICT OF INTEREST

The author declares no conflict of interest in this study.

## AUTHOR'S CONTRIBUTION

The author played a critical role in designing the study, determining the methodology, and selecting the appropriate data collection techniques to assess mobile telehealth systems and their impact on information accessibility. The researcher also did data collection, analysis, interpretation of results, and interpretation of findings.

## DATA AVAILABILITY

The availability of data was crucial for transparency and reproducibility in research. The author ensured that the data collected for the study was accessible for review by other researchers or stakeholders.

## ACKNOWLEDGMENTS

I would like to appreciate and commend my supervisor for his invaluable knowledge, skills, and experiences that helped me to accomplish this project. I extend my indisputable gratitude to the Medical Director, of Kitagata Hospital for his cooperation plus my family for their instrumental cooperation and social support towards the successful completion of this project.

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#### **PUBLISHER DETAILS**

### **Student's Journal of Health Research (SJHR)**

**(ISSN 2709-9997) Online**

**(ISSN 3006-1059) Print**

**Category: Non-Governmental & Non-profit Organization**

**Email: [studentsjournal2020@gmail.com](mailto:studentsjournal2020@gmail.com)**

**WhatsApp: +256 775 434 261**

**Location: Scholar's Summit Nakigalala, P. O. Box 701432,  
Entebbe Uganda, East Africa**

