

**TELEMEDICINE AS A MECHANISM FOR PROVIDING
ACCESSIBLE MEDICAL CARE: WHAT ARE THE
DETERMINANTS OF ITS ADOPTION IN NAIROBI COUNTY? A
CASE OF MP SHAH**

SHARON N. MUTUKU

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DECLARATION

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STUDENT NAME: Sharon Ndinda Mutuku

REG NO: 119959



..... Signature

.....22/08/2022..... Date

APPROVAL

The dissertation of Sharon Ndinda Mutuku was reviewed and approved by:

Dr. Joseph Onyango

Senior Faculty, Strathmore Business School

Strathmore University

Signature



.....

Date.....20/06/2022.....

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LIST OF ABBREVIATIONS

CDC:	Centers for Disease Control and Prevention
ICT:	Information Communication and Technology
IS:	Information Systems
IT:	Information Technology
KEMRI:	Kenya Medical Research Institute
NACOSTI:	National Commission for Science, Technology, and Innovation

DEFINITION OF TERMS

Telemedicine: is a process associated with the provision of healthcare in distant areas through the use of Information Communication Technology (ICT) (Cegarra-Sánchez et al., 2020)

Telemedicine barriers: factors that inhibit successful adoption of telemedicine (Driessen et al., 2018)

Telemedicine drivers: factors that encourage the adoption of telemedicine (Driessen et al., 2018)

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DEDICATION

I dedicate this dissertation to my two daughters Tania and Taraji for always giving me time to focus on my research.

To my soul mate, Dr. Elijah Matolo, thank you for being my pillar of strength at all times and for provoking me intellectually.

To my supervisor Dr. Joseph Onyango, I could not have achieved this without your overwhelming support. God bless you abundantly.

ABSTRACT

Over the years, technology has experienced rapid development especially in the health sector. Telemedicine is already implemented in various health facilities thus promising ease in accessibility of health care services. Telemedicine is a form of technology that promises ease and convenience in the accessibility of healthcare. Patients can easily access healthcare at reduced costs and in a timely manner. Irrespective of these benefits, the adoption of telemedicine is still relatively low in Kenya. The purpose of the study was to investigate the drivers of telemedicine adoption in Nairobi County. The study sought to determine the influence of awareness, role perception, technological enablers, and preferences of medical care on the adoption of telemedicine among patients in Nairobi County. A descriptive cross-sectional research design was used for this study. The study targeted patients at MP Shah Hospital, which is a tier-one private health facility in Nairobi, Kenya. Purposive sampling was used in the selection of the health facility and simple random sampling was used in the selection of patients in the facilities. Fischer's formula was used in the calculation of the sample size. A total of 152 respondents were captured in the study. Data was collected through the use of a structured questionnaire was used in the collection of data among the patients. Descriptive statistics was conducted through regression analysis to establish the nature of relationships between the variables. The level of statistical significance was set at $p < 0.05$. The result shows that knowledge and awareness are key factors associated with adoption of telemedicine. This shows that the patients need to have knowledge and be aware of telemedicine to enable the adoption of telemedicine. There was also a need to increase the level of knowledge and awareness which would also improve on the perceptions towards telemedicine. Lack of physical examination was also a major concern contributing to low adoption of telemedicine. Additionally, improving on the technological enablers would be vital in increasing the adoption of telemedicine services.

1. CHAPTER ONE: INTRODUCTION

This chapter provides an overview of what telemedicine is and its associated benefits and challenges across various regions. It also provides critical background information about the extent of adoption. This chapter provides preliminary information on the key variables that influence the adoption of telemedicine. It also provides a problem statement, the research objectives, research questions, and the scope of the study.

1.1. Background to the Study

The use of information technology (IT) has brought about significant benefits to society, especially in the health sector. The provision of quality healthcare has been a major concern, especially for people residing in remote areas. However, the introduction of telemedicine serves as a critical factor in the provision of quality care (CDC, 2020). Telemedicine is a process associated with the provision of healthcare in distant areas through the use of Information Communication Technology (ICT). It is characterized by the provision of healthcare delivery across different geographic settings through the use of telecommunication and computers. Additionally, it is instrumental in the exchange of information between the healthcare practitioner and the patient that would in turn result to ensure a proper diagnosis, treatment, and disease prevention (Dorsey & Topol, 2020).

According to Hyder & Razzak (2020), telemedicine in the United States (U.S) has been in use for decades and has been instrumental in enhancing the level of quality care through the reduction in hospital readmissions and an increased level of savings for patients. The Patient Protection and Affordable care Act requires all Medicare services to penalize readmissions among health facilities that occur 30 days after discharge in the U.S. Monaghesh & Hajizadeh, (2020) also note that telemedicine has been instrumental in the provision of quality care to patients during the COVID-19 outbreak.

In Africa, the use of telehealth is largely a new concept and is not fully utilized in the healthcare realm as a result of poor policies and implementation from the government (Babalola et al., 2021). Adepoju (2020) also notes that countries such as Nigeria, Kenya, Ghana, and South Africa have a rapidly improved telecommunications structure which

would be instrumental in improving the quality of care in sub-Saharan Africa. However, other technological factors influence adoption such as preferred type of medical care, the technical enablers (Availability of IT infrastructure, network availability), the perception of the patients and healthcare workers, and awareness of telemedicine (Basaran et al., 2020; Elhadi et al., 2021; Nyamu, 2016; Zahoor et al., 2020).

Part of the key objectives of the Kenya Big 4 Agenda is the implementation of affordable healthcare for all Kenyan citizens irrespective of their socioeconomic characteristics (GOK, 2020). Similarly, the WHO encourages all countries to seek to provide Universal Health Coverage (UHC) to all the citizens who are in need and more importantly where they need it without causing any financial constraints (WHO, 2020). Furthermore, the aim of the Kenya Health Policy 2014-2030 is the provision of direction for the attainment of an improved health state of health in the country (GOK, 2014). Telemedicine could be instrumental in enabling the attainment of these goals by provisioning easily accessible healthcare to individuals in need at their convenience.

1.1.1. Determinants of Telemedicine Adoption

Various studies focus on telemedicine by capturing the determinants associated with its adoption. One of the key factors includes the level of awareness in terms of knowledge about the existence of the system and its usage of the system. Ezeonwumelu et al. (2022) reveal that the adoption and telemedicine and the satisfaction are associated with the level of awareness of the respondents. On the other hand, Sullivan et al. (2019) captured a significant relationship between the perception of telemedicine, trust, and more importantly the adoption of telemedicine. Cegarra-Sánchez et al. (2020) posit that the technological enablers such as reliability of the system, and network infrastructure were associated with the usage of the system. Similarly, Ferucci et al. (2021) captured factors such as gender, age, region, and the outpatient visit rates as significant factors associated with the adoption of telemedicine. This study focused on factors such as awareness, perception, technological awareness, and the preference for medical care as discussed in the following sections. These factors are the most predominant among other studies that

focus on the adoption of telemedicine. They will be instrumental in capturing their role in the adoption of telemedicine in health facilities in the country.

1.1.2. Awareness and Adoption of Telemedicine

Telemedicine is increasingly being adopted and people are more aware of its existence and benefits. These services were mostly developed to serve individuals experiencing challenges accessing health services given their geographical location (remote areas). People in remote areas have low levels of awareness of the existence of telemedicine and its benefits (Sakurai et al., 2017). According to a study conducted by Parimbelli et al. (2018), patients are would be more willing to adopt telemedicine if they had more knowledge of how it works and its associated benefits. Ashfaq et al. (2020) also note that patients not only need to be aware of telemedicine but they also need to be provided with information on the legal aspects that are linked to the use of telemedicine.

Kamal et al. (2020) also note that the intent to use or adapt to telemedicine services is linked to the ease of use, technological anxiety, trust, perceived risk, social influence, and the facilitating conditions which would enable increased adoption among the patients. Yamin & Alyoubi (2020) also notes that most patients are highly resistant to the adoption of telemedicine as they are unaware of the potential benefits and risks associated with the usage of the services.

1.1.3. Perception on Adoption of Telemedicine

The adoption of telemedicine services is also greatly influenced by the attitudes and beliefs of the patients and healthcare professionals. This prevents the full adoption of telemedicine services. A study conducted in Middle Eastern countries revealed that most countries have improved levels of adoption of telemedicine health. However, the study captured a variety of challenges such as poor system quality, lack of training, lack of funding, and resistance among the patients and doctors (Al-Samarraie et al., 2020). A study conducted by Zahoor et al. (2020) revealed that patients tremendous level of concern and fear when visiting care in hospitals due to the fear of getting infected with

the COVID-19 virus. The study revealed that the public showed a positive attitude and perception concerning the idea of telemedicine.

Patient attitudes can also be influenced by their health and perceptions as opposed to their demographics. In essence, receptive patients were more likely to focus on the convenience of the system while unreceptive patients valued the patient-physician relationships. Additionally, the type of ailment strongly influenced their attitude towards telemedicine. Patients suffering from diabetes expressed strong concerns and were unreceptive given the state of their condition (Valikodath et al., 2017). According to Ray et al. (2017), three key factors influence the adoption of telemedicine services. This is inclusive of the contextual factors (Geography, hospital culture, and individual experience), perceived usefulness, and perceived ease of use of the system. Within these domains, the perceived usefulness of telemedicine services is the most profound factor as the public explores the advantages of the system. Wernhart et al. (2019), also note that the adoption of these services would not enhance the doctor-patient relationship. Secondly, these systems would have a significant impact on the patient confidentiality due to the data privacy and security issues

Zobair et al. (2020) also posit that there are considerable factors associated with the adoption of telemedicine factors such as health staff motivation, the extent of patient satisfaction, the trustworthiness of the system, and organizational effectiveness of the system. These alongside other indirect technological factors such as lack of information and communication technology infrastructure and allocation of the available resources needed for deployment of telemedicine services (Zobair et al., 2020).

1.1.4. Technological Enablers and Adoption of Telemedicine

Technological barriers are considered the main concern dealing with the adoption of telemedicine. Issues such as geographical location, demographic characteristics of the patient, and operational factors pose a considerable barrier to the adoption of these systems. Rural locations lack the appropriate infrastructure in enabling the use of telemedicine health services such as networks and infrastructure. This poses a concern when it comes to the promotion of live videos (Lin et al., 2018). Another study conducted

by Al-Samarraie et al. (2020) revealed multiple factors that prevent the successful adoption of telemedicine. This is inclusive of factors such as poor infrastructures, low levels of funding, poor system quality, and lack of training in information technology.

Another study captured multiple factors associated with the adoption of telemedicine services. This is inclusive of factors such as the extent of patient education, technological considerations, compliance factors (security of patient health information), and practice logistics (Rao et al., 2020). Similarly, Kruse et al. (2020) revealed that telehealth was influenced by factors such as cost, lack of desire, and technological literacy which increasingly prevented the adoption of these services. Taylor et al. (2015) also revealed that staff attitudes played a major role in the resistance to the use of telemedicine. The study also revealed that the technological factors such as the reliability and flexibility of the available technology accompanied the needed resources for the services. Another study conducted by Hassibian & Hassibian, (2016) showed that developing countries experience the biggest technological concerns related to the adoption of telemedicine attributed to a lack of resources and poor infrastructure required for implementation. A similar study conducted in Ethiopia also revealed that the adoption of telemedicine was affected by factors such as lack of infrastructure and costs associated with the adoption of the system (Sagaro et al., 2020).

1.1.5. Preference for Medical Care and Adoption of Telemedicine

The preferences associated with medical care are linked with an increased level of adoption on the adoption of telemedicine. Patients prefer different types of care, especially concerning the need to access health services. Face-to-face interactions are usually preferred by patients undergoing chronic illnesses such as diabetes (Valikodath et al., 2017). Similarly, there are health workers who prefer face-to-face interactions as it not only promotes better doctor relationships but is also easier to care for the patients and is considered as being more secure (Wernhart et al., 2019). Another study that focused on COVID-19 revealed that most patients preferred telemedicine as it reduced the fear of infection of the disease associated with visiting health facilities. In essence, the usage of

telemedicine to seek healthcare during the COVID-19 pandemic significantly reduced the risk of infection (Elhadi et al., 2021).

Bokolo, (2021) also explored the role of telemedicine during the COVID-19 period and the associated challenges associated with its adoption. Findings from the study revealed that the public preferred telemedicine and other virtual software which lessened the spread of the disease and decreased the emergency room visits. A similar study focusing on burn patients revealed that health experts demanded face-to-face interactions only for assessment (60.7%). On the other hand, most patients (92.3%) believed that preferred telemedicine during follow-up especially given the distance associated with seeking care in the burn center (Basaran et al., 2020). A study conducted revealed no significant preferences among the patients as long as their comfort between both systems (telemedicine and face-to-face) was guaranteed (Chalmers et al., 2018). However, according to Sim & Lee, (2021) patients preferred telemedicine given the flexibility of the system which could easily be adapted to their needs. Additionally, this system provides adequate technological and physician support which is instrumental in disease management and increased adoption of the system.

1.1.6. Private Medical Institutions in Nairobi

Private hospitals are instrumental in the provision of healthcare services in Kenya. They not only provide quality services to the patients in need but they also help in alleviating public facilities from the influx of patients. These facilities are often perceived to provide quality services but are also deemed to be expensive (Gioko, 2019). However, these charges are often regulated by the Medical Practitioners and Dentist Board. There are 55 private health facilities located in Nairobi alone some of the main private health facilities include The Aga Khan Hospital, Nairobi Hospital, MP Shah Hospital, Karen Hospital, and The Nairobi Women's Hospital (Mwangi & Kihara, 2021). The focus of this study was on MP Shah Hospital which has some technologically advanced equipment including the implementation of telemedicine in service provision.

1.2. Problem Statement

Telemedicine is deemed instrumental in improving the level of healthcare access and dealing with the shortage of doctors and health-related costs (Bokolo, 2021). However, the level of adoption of telemedicine is still relatively low in developing countries such as Kenya (Mbugua, 2016). The level of adoption of telemedicine in Kenya is low in both private and public hospitals (Njoroge et al., 2017). Similarly, the low adoption of telemedicine is still experienced in cities and far much worse in remote areas in the country. Kenya has a shortage of medical doctors with a higher concentration of specialists witnessed in the cities (Mbugua, 2016).

Over the years, there has been consistent growth concerning the development of infrastructure in Kenya. The Ministry of Industrialization, Trade, and Enterprise development reported that the government had invested \$55 billion with a majority of the funds directed toward telecommunication and power generation infrastructure around the country (GOK, 2020). The government also continues to provide constant support and provide conducive operational environments for telemedicine through the development of inclusive e-health policies. However, majority of these projects have been unsuccessful which poses the need to investigate factors associated with the low chances of success (Nyamu, 2016). Njoroge et al., (2017) also note that there are multiple mHealth and eHealth projects in Kenya that have been established but these strategies are relatively low in remote areas and the least urbanized areas that have multiple healthcare needs.

Safaricom is also working in conjunction with the county governments and hospitals to link over 32,000 children in counties such as Lamu, Baringo, Samburu, and Homabay with the needed health services. Gertrude's Children's hospital also invested 35 million in the creation of telemedicine practices (Mutinda, 2021). Additionally, there exists inequality in healthcare access for the citizens who live in distant towns hence forced to travel to the cities in search of specialized doctors (Otieno et al., 2020). Telemedicine can therefore be used to improve this inequality since it aims to break the geographical barriers (Ma, 1996). The healthcare systems have been riddled with significant challenges, especially concerning responding to the high toll of cases of COVID-19.

Healthcare practitioners now deal with a high number of sick patients which translates to delays given the efficiency associated with catering to all patients. Similarly, the pandemic has been associated with an increased number of mental health cases attributed to an increased level of stress, anxiety, and depression.

These are areas that can be controlled through the use of telemedicine. Additionally, there's low knowledge associated with the extent of the adoption of telemedicine in the country (Njoroge et al., 2017). Similarly, there is limited knowledge associated with the factors that play a significant role in the adoption of this technology. Furthermore, a majority of studies mostly focus on telemedicine in the hospital context with minimal focus on how these factors influence the adoption of telemedicine among the patients. Similarly, technological innovations are dependent on increased usage to effect change however, the ethical and legal fronts do not necessarily support this notion. Health workers are constantly challenged with the queries such as the computer's role in the provision of health services, how they would ensure that the patient-provider decisions are not crowded, or the implications and benefits associated with using these systems. Therefore, this study sought to explore telemedicine as a mechanism in the provision of accessible medical care by capturing the drivers associated with its adoption.

This study was conducted at MP Shah Hospital which is a tier-one private hospital in Nairobi, Kenya. Mp Shah Hospital offers medical care to patients both physically and virtually. Some of its services include Outpatient services, Inpatient service, well-baby clinic, oncology services, and dental and optical services among others

1.3. Research Objectives

1.3.1. General Objective

The main objective of this study was to explore telemedicine as a mechanism in the provision of accessible medical care by capturing the drivers associated with its adoption

1.3.2. Specific Objectives

- i. To determine the influence of awareness on the adoption of telemedicine in Nairobi County
- ii. To determine the role of perception on adoption of telemedicine in Nairobi County
- iii. To determine the role of technological enablers on the adoption of telemedicine in Nairobi County
- iv. To determine the role preference of medical care among patients in Nairobi County

1.4. Research Questions

- i. What is the influence of awareness among patients on the adoption of telemedicine in Nairobi County?
- ii. What is the role of perception on adoption of telemedicine in Nairobi County?
- iii. What is the role of technological enablers in the adoption of telemedicine in Nairobi County?
- iv. What is the role of preference of medical care among patients in Nairobi County?

1.5. Scope of the Study

This study focused on the drivers that influence the adoption of telemedicine among patients attending MP Shah hospital as such the findings are generalizable to hospitals with similar telecommunications infrastructure. This facility was selected because it has an existing telemedicine infrastructure and its attempt to improve the efficiency of telemedicine systems. The respondents were composed of the patients attending the facility for outpatient services. The study also captured factors such as awareness, perception, technological enablers, and preference for medical care. The study did not cover remote monitoring and forward telemedicine. The data was collected over two months.

1.6. Significance of the Study

1.6.1. Healthcare Industry

The study will provide a better understanding of factors influencing the adoption of telemedicine by patients in Kenya. It will be of importance to ICT companies who will seek to meet the needs of the patients based on the ease of use of the system thus improving its usability. Hospital administrators and managers will also provide critical insights which can provide key information on the challenges associated with the usability of telemedicine in health facilities thus improving the extent of healthcare delivery. Knowledge and awareness as captured in the study would help ensure that the health care industry exploits different strategies to increase these perspectives among the patients to improve adoption of telemedicine.

1.6.2. Ministry of Health

Information from this study will be key in providing key statistics that could be used by government agencies in making key decisions regarding the implementation of telemedicine in health facilities. Public hospitals encounter significant issues in terms of shortage of healthcare workers and high healthcare costs that could be controlled through telemedicine.

1.6.3. Future researchers/ Academicians

Findings from this study will provide a basis for other studies which will also help in the exploration of other factors influencing the adoption of Telemedicine services. Medical insurance coverage is a major impediment to the provision of quality healthcare as most people are unable to afford these services. However, knowledge captured from the study will reduce insurance costs in terms of premium and healthcare costs since medical conditions will be well managed with consistent and regular doctor consultations and reviews.

2. CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter presents the literature review, theoretical literature review, and empirical literature review which are linked with the objectives of the study. It also presents the conceptual framework.

2.2. Theoretical Review of Literature

A theory and a model was captured in this section which explores the factors associated with the adoption of Telemedicine. This includes the Diffusion of innovation theory which explores how a particular innovation is adopted among people and the technology acceptance model which explores the determinants associated with the adoption of technology.

2.2.1. Diffusion of Innovation Theory

This theory was developed by Rogers (2003) to explain how innovations and ideas are adopted and spread across populations. The theory states that diffusion is a type of communication that occurs over time among individuals in a particular social system. Once an innovation is introduced in a specific social setting, the people will either accept or reject judging on several factors. This theory mainly focuses on five key areas: the description of the innovation, the decision-making process considered by the target population, the characteristics of the people who are likely to adopt the idea, the consequences of adopting the theory, and the communication channels.

Various steps are associated with the adoption of a particular idea which includes: Knowledge in which the people are introduced to innovation but have little information about it, and they are unmotivated to seek more information about it. Persuasion in which the people begin to develop interest and seek more details about the innovation. Decision where people begin weighing the advantages and disadvantages of adopting the

innovation. It is also at this stage that they choose to accept or reject the invention. Implementation in which people begin to utilize the model to varying degrees while they also determine its usefulness and continue to search for more information about it. Lastly, confirmation where a final decision is made to continue using the innovation.

Telemedicine is a relative innovation that is currently riddled with challenges, especially regarding its adoption. This is mainly attributed to the fact that people have different perspectives on its practicality and ability to deliver its intended purpose. However, the diffusion of innovation stipulates that to ensure the adoption of telemedicine, various steps need to be considered including the level of knowledge which would play a significant role in the adoption and rejection of telemedicine.

The theory also classifies the individuals in the social system about how they adapt to innovation. This theory categorizes individuals into five classes: innovators, early adopters, early majority, late majority, and laggards. The innovators include individuals who are willing to take risks, have financial liquidity, and have access to scientific sources and other innovators. The early adopters have the highest risk degree of opinions, and they also have high social status among peers. Most times, they have leadership roles and are comfortable bringing new ideas on board. However, they are also discreet, and they use judicious ways to maintain central communication. The early Majority are individuals who take a substantial amount of time to adopt innovations. They also have average social status, and a limited number of contacts, and they do not hold any positions of opinion leadership. The late majority are individuals who adopt the innovations long after the early majority, and they have a high level of skepticism towards a particular invention. They also have little finance and contact. Lastly, the laggards are usually the last to adopt a particular innovation. They tend to focus on the traditions and have low social status, financial liquidity, and contact. The diffusion of innovation captures the aspect on knowledge, awareness and persuasion of the respondents that influences their adoption of new innovation

2.2.2. Technology Acceptance Model

The technology acceptance model was developed as a way of examining the determinants of modern technology. This model was mainly an expansion of the theory of reasoned action, which Ajzen and Fishbein's developed to describe all factors associated with acceptance, usage, and the factors that influence the usage of information technology (Priyanka & Kumar, 2013). This theory has two essential attributes, which include perceived usefulness and perceived ease of use. Additionally, the model also states that some external variables also influence the adoption of new technology like their attitudes, beliefs, and intentions.

External variables are mainly inclusive of all factors outside the individual, which impact the attitudes of and usage of innovations, e.g., training, experience with computers, the quality of the systems, etc.

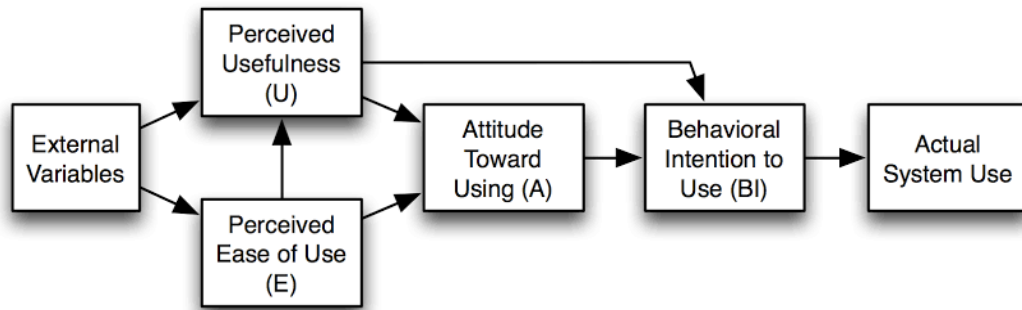


Figure 2.1: Technology Acceptance Model

Source: Priyanka & Kumar (2013)

Perceived Usefulness

An increase in access to information improves human competence as it is associated with access to authentic information. However, access to authentic information is related to the user's reluctance to accept or use available strategies to access information. In essence, perceived usefulness refers to the extent to which an individual believes that using a

particular technique enhances their performance. In essence, the technology acceptance model depicts that value is critical in improving the level of performance

Perceived Ease of Use

This is the perception that a system user has concerning how a particular system or innovation is and freedom from complexity during its use. People are more likely to accept innovations that are easy to use compared to complicated applications. Ease in the level of technology is also associated with an increase in access to information literacy. However, it is also critical to note that several factors are related to the ease of use of modern technology. They include factors like work experience, the extent to which an individual has been exposed or used technological instruments, and the number of resources available to access such innovations.

External Variables

The technology acceptance model also states that several external variables can be used concerning new skills. There are at least four classifications of variables: organizational characteristics, system characteristics, user characteristics, and other variables.

Table 2.1: External Variables of Technology Adoption

Organizational characteristics	<ol style="list-style-type: none">1) Competitive environment2) User support3) Internal training4) Management support5) Policy support6) Organizational composition7) Peer influence8) Training and development
System characteristics	<ol style="list-style-type: none">1) System design2) System operation3) System maintenance4) System auditing5) Access cost6) Interface7) User-friendliness8) Information quality9) System quality10) Cybersecurity
Users' characteristics	<ol style="list-style-type: none">1) Age2) Cognitive ability3) Information anxiety4) Computer anxiety5) Computer literacy6) Level of education7) Personality8) Perceived playfulness9) Self-efficacy10) Tenure at work11) Gender12) Experience
Other variables	<ol style="list-style-type: none">1) Social influence2) Need for change3) Facilitating conditions4) Cultural affinity5) External computing support

Source: Priyanka & Kumar (2013)

The technology acceptance model captures all the critical factors that play a significant role in the adoption of new technology. Telemedicine is a new technology designed to ease the burden of patients in accessing healthcare through technology. However, there are a variety of issues that are associated with its acceptance of telemedicine such as perceived usefulness, ease of use, organizational characteristics, system characteristics, user characteristics, and other variables (Social influence, culture, need for change). Examining these factors was instrumental in carefully determining the factors that are key in influencing the adoption of the technology (Priyanka & Kumar, 2013). Based on the objectives this theory focuses on the technological enablers and the perception of the people on the adoption of technologies.

2.3. Empirical Review of Literature

This section provides literature on past studies that focused on the adoption of telemedicine among patients. The focus was to capture the influence of awareness, perception, technological enablers, and the preference of medical care on the adoption of telemedicine.

Table 2.2: Empirical Review

Research Objective	Researcher	Aim	Findings
To determine the influence of awareness on adoption of telemedicine in Nairobi County	Ashfaq et al., (2020)	To determine the employment of telemedicine in public health facilities in Pakistan.	The study revealed that the usage of telemedicine was continuously being adopted in various departments. The doctors also showed reasonable levels of awareness on telemedicine. However, they also agreed on the need to increase the level of knowledge and awareness especially among the patients. This was deemed instrumental in improving the usage, efficiency and effectiveness of telemedicine.

to investigate the knowledge and attitudes among health professionals in three health facilities in Ethiopia	Biruk & Abetu, (2018).	to investigate the knowledge and attitudes among health professionals in three health facilities in Ethiopia	The results showed that a majority of the respondents had high levels of knowledge of the use of telemedicine services. The respondents also had good attitudes towards telemedicine
the adoption of teleconsultation services during the COVID-19 pandemic.	Ezeonwumelu et al. (2022)	Investigating the perception of telemedicine	The participants noted that telemedicine was instrumental in improving the experience and satisfaction of consultation. They also noted that teleconsultation services were affordable, time-saving, and a considerable safe way of healthcare delivery, especially during the COVID-19 pandemic.
to explore the public's perception of the use of telemedicine surgical consultations during the COVID-19 pandemic	(Sorensen et al., 2020).	Exploring public's perception of telemedicine technologies	A majority of the users revealed that they were generally satisfied with telemedicine. Additionally, the findings revealed that the preference for in-person healthcare significantly reduced which was associated with the increased level of fear concerning the COVID-19 pandemic. However, the preference for telemedicine also decreased with the increased complexity of surgical interventions irrespective of the pandemic. The respondents also felt that trust and comfort were better captured through the use of in-person interactions
The patient's perceptions of telehealth	Lee et al. (2018)	To investigate the perception of telemedicine users	The patients noted that teleconsultation has been instrumental in improving the quality of health services in Nigeria. This was greatly satisfactory especially given the challenges associated with the spread of the COVID-19 which makes limits the one-on-one contact. It is also affordable and less time-consuming

Obstetrics patients' experiences associated with the usage of telemedicine during the COVID-19 pandemic	Sulaman et al. (2022) a	To investigate the experiences of Telemedicine users	The results captured from the study revealed that a majority of the respondents were confident about the future usage of telemedicine. This was largely attributed to its cost-effectiveness and acceptable nature in ensuring universal health coverage. However, challenges associated with its usage have mostly been associated with the strength or effectiveness of communication.
To evaluate perceptions and the level of satisfaction of patients towards the usage of telemedicine during the COVID-19 pandemic in Pakistan	(Khan et al., 2021).	Evaluating perceptions and level of satisfaction of telemedicine technologies	Overall, the patients noted that telemedicine was not only convenient but also satisfactory especially in the provision of healthcare services. This was mostly associated with good response time but they also noted the need to provide training for patients and consultants
Effectiveness associated with the adoption of telemedicine technologies	Cegarra-Sánchez et al. (2020)	To investigate factors associated with adoption of telemedicine technologies	Findings from the study revealed that the adoption of telemedicine technology can only be achieved through the exploitation and exploration of external sources of information. The low level of adoption of these technologies is associated with the limited number of frameworks that can hasten the process. The support of this approach will be instrumental in improving the level of utilization of telemedicine technologies
To capture the level of awareness, knowledge, attitude, and skills on telemedicine among health care workers in low resource countries	(Elhadi et al., 2021).	The focus of the study was to provide a critical overview of the health worker's level of awareness knowledge, attitudes, and skills	The study revealed that healthcare workers had a high level of knowledge, attitude, and skills towards the use and adoption of telemedicine. There were no significant scores in relation to these scores among health workers in private and public health facilities. Respondents with a high level of computer skills were more likely to have high levels of knowledge and

		associated with the usage of telehealth services in Libya	skills in the use of telemedicine
To investigate the knowledge, attitude, and other factors associated with telemedicine among healthcare workers in Ethiopia	Assaye et al. (2020)	Investigating the extent of knowledge attitudes and other related factors and their impact on telemedicine adoption	The results captured also showed that information sharing culture, having IT support, internet information sources, and being male were linked with higher odds of being knowledgeable on the telemedicine services. The study showed that a majority of the respondents had high levels of knowledge and awareness of telemedicine services.
To capture the factors associated with the willingness the acceptance of telemedicine in the Indian health sector	Malhotra et al. (2020)	The focus was to assess the extent of knowledge, perception, and willingness to adopt telemedicine among healthcare students.	A total of 43% of the population showed an insufficient level of knowledge on the use of telemedicine but 90.9% showed that telemedicine was a viable approach and was willing to integrate it into their studies. The perception of the health students was instrumental in improving their practice and students showed a willingness to integrate these practices in their future.
To capture the knowledge and attitudes regarding telemedicine in relation to healthcare workers in Pakistan	Ashfaq et al. (2020)	To capture the knowledge and attitudes regarding telemedicine in relation to healthcare workers in Pakistan	However, nearly half of the respondents (42.9%) revealed that telemedicine was critical in limiting the doctor-patient relationship and would contribute to a breach of patient privacy. They also believed that poverty and level of education were instrumental in limiting the practice of telemedicine in the developing world.

2.4. Summary of Research Gaps

A majority of the studies on telemedicine are conducted in developed countries with very little focus on the state of telemedicine adoption in developing countries. Additionally, a majority of the studies capture factors such as knowledge, perceptions, and attitudes of the patients with little attention to the technological enablers and the attitude of the patients towards telemedicine (Biruk & Abetu, 2018; Lee et al., 2018; Paczka-Giorgi et al., 2021; Sorensen et al., 2020). As such, there is little information capturing the extent and ease of use of telemedicine. Furthermore, a majority of the studies investigate the use and perceptions of telemedicine in hospitals and among healthcare providers as opposed to focusing on patients (Biruk & Abetu, 2018; Bokolo, 2021; Sorensen et al., 2020). Furthermore, the implementation and use of telehealth especially in developing countries have achieved little to no success (Basil et al., 2020; Wang & Wang, 2021). Similarly, there are no studies that compare the patient's preference to telemedicine. There is also limited information on not only the role but also the extent to which technological enablers have been set to enable better service delivery of telemedicine, especially in rural areas. In relation to Kenya, there is a need to capture adequate information on the role of these factors in the country to determine their overall impact on the attainment of affordable healthcare for all individuals.

2.5. Conceptual Framework

These variables were acquired as a result of the exploration of various studies that have focused on telemedicine (Mbugua, 2016), (Malhotra et al., 2020), (Sim & Lee, 2021). The independent variables include awareness of telemedicine, perception of telemedicine, technological enablers, and preference for medical. These factors influence the adoption of telemedicine among patients (Dependent variable) which was measured in terms of their usage as shown in figure 2.2.

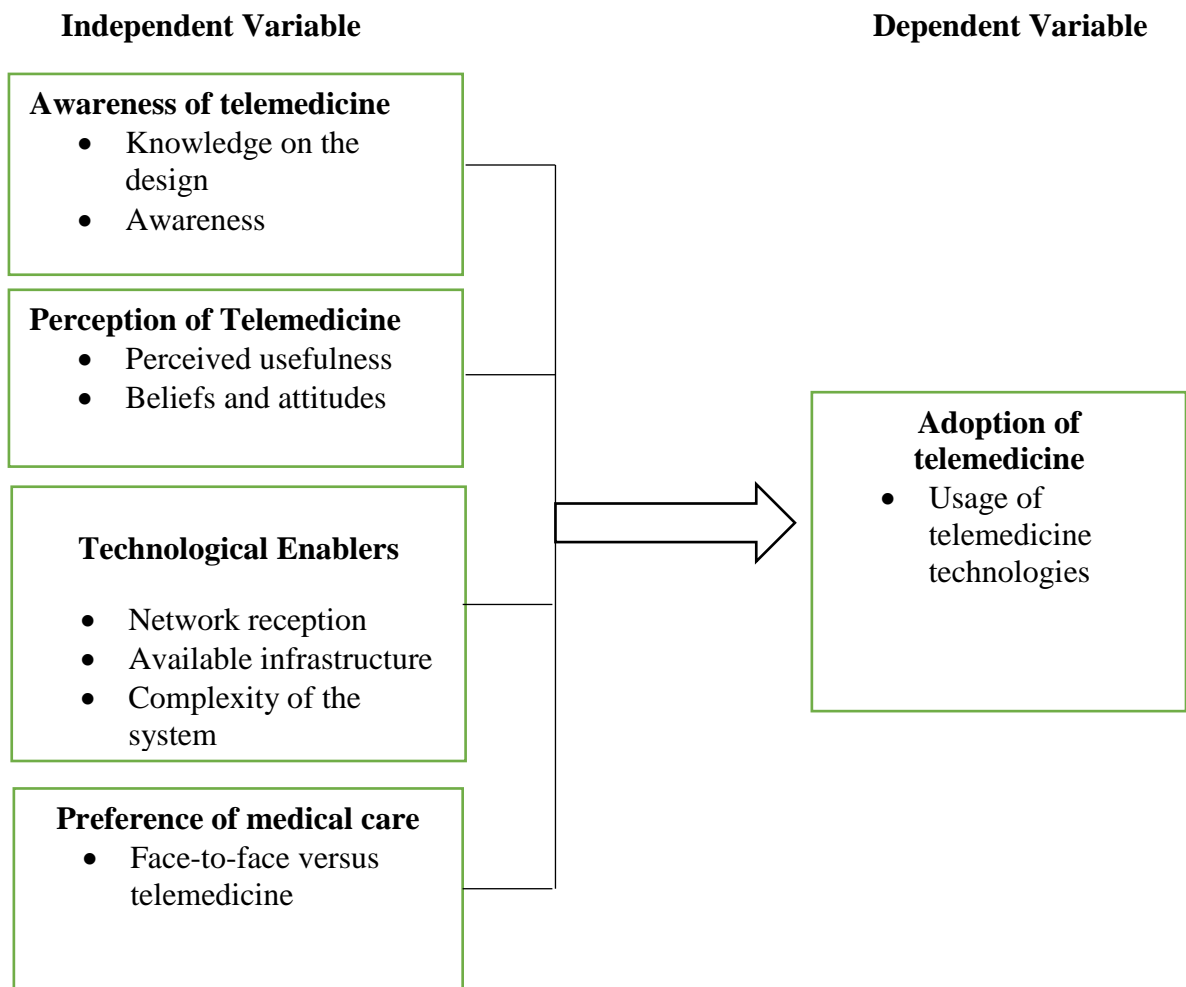


Figure 2.2: Conceptual Framework

2.6. Operationalization of Variables

Table 2.2: Operationalization of Variables

Research Questions	Variables	Measures	Measure of indicator	Author
What is the role of awareness among patients on the adoption of telemedicine in Nairobi County?	Awareness of adoption of telemedicine	Awareness of the existence of telemedicine	Using 5- Point Likert Type Scale	Zayapragassarazan & Kumar (2018), Mbugua (2016)
		Knowledge on telemedicine	Yes	
			No	
How does perception influence the adoption of telemedicine in Nairobi County?	Perception on adoption	Perceived usefulness of telemedicine	Using 5- Point Likert Type Scale	Zayapragassarazan & Kumar (2018), Mbugua (2016)
			Benefits associated with the usage of the system	
			Number of failures and loopholes in the system	
			Yes	
		No		
		Beliefs and attitudes towards telemedicine	Yes	
			No	
			Yes	
No				
What is the role of technological enablers in the adoption of telemedicine in Nairobi County?	Technological barriers	Network reception	Yes	Kang'ethe (2018)
			No	
		Available infrastructure	Yes	
			No	
		The complexity of the system	Using 5- Point Likert Type Scale	
		How does the preference for medical care among patients influence the adoption of	Preference for medical care	
No				
Preference for telemedicine	Yes			
	No			

telemedicine in Nairobi County?				
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2.7. Summary of Chapter

In relation to the provided literature, telemedicine acts as a cost-effective approach to enabling the provision of quality health to all patients especially those in remote areas. the adoption and usage of telehealth have been successful in developed countries and rapidly becoming effective. The concern is in developing countries that encounter a significant number of barriers that inhibit the effective adoption of telehealth.

3. CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

This section presents the methodology that was employed during the study and it is inclusive of the study design, research philosophy, study population, sampling, data collection, pretesting, data analysis, and ethical considerations.

3.2. Research Philosophy

This study relied on positivism philosophy which stipulates that all knowledge that should be recognized should be based on scientific verification. This is achieved through logic, mathematical or other forms of scientific proof. In essence, this theory states that there is a need to generate facts to ensure that the information is verifiable (Ryan, 2018).

3.3. The Research Design

A descriptive cross-sectional research design was used for this study, this is because the study was done within a specific period. The study captured quantitative data. Descriptive research is associated with the observation and measurement of variables without manipulation of the variables. It is critical in the establishment of the range and distribution of various characteristics. In the context of this study, there was need to investigate the level of awareness, knowledge, attitudes, and perception of patients towards the adoption of telemedicine. Descriptive research design discusses particular characteristics of the phenomena of interest (Kothari, 2009). The choice for this design in this study was informed by its capability to establish bivariate relationships between the variables which were observed.

Descriptive design is a method that is vital in the collection of data from a sample population to determine the current status of the population based on the variables of the study. It is a design that is vital in establishing conditions based on what is on the ground and especially from large populations. This design can also be instrumental in the

provision of information on the attitudes which are difficult to measure through an observational approach (Kothari, 2009). Mugenda & Mugenda (2003) also notes that a descriptive research design can also be achieved through the use of survey data and it can be instrumental in resolving some of the existent concerns and ensuring that the specific objectives are met. Its main purpose is to enable the easy collection of the behaviors, opinions, attitudes, and characteristics of the sample and the population.

3.4. Population

The unit of analysis was patients who sought medical care at MP Shah Hospital. MP Shah attends to over 2000 patients in outpatient in a month as per the MP shah management report and 210 bed capacity for in patients (M.P Shah Hospital, 2022). Respondents who took part in the study included those who consented to take part in the study and those who were above the age of 18 years. The excluded respondents included those who did not consent to take part in the study.

3.5. Sampling Design

3.5.1. Sample Size Determination

Fischer's formula was used in the calculation of the sample size. For populations higher than 10,000:

$$n = \frac{Z^2 pq}{d^2}$$

Where :

(n)=the desired sample size

Z=the standard normal deviate that provides a 95% confidence interval of (1.96)

(p)=50% was used

(q)=1-p

(d)=absolute precision (error bound) (0.05)

Hence:

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384.16 = 385$$

However, the population of patients in MP Shah is below 10,000 hence the final estimate was calculated as follows:

$$nf = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where:

(nf) = the desired sample size (when population is less than 10,000)

(n) = the desired sample size (when population is more than 10,000)

N = population of patients (210)

Hence:

$$nf = \frac{385}{1 + \left(\frac{385}{210}\right)} = 137.5 \approx 138$$

A 10% attrition rate was included for incomplete questionnaires as such the final sample size is $138+14=152$ respondents.

3.5.2. Sampling Technique

This study adopted probability sampling method and non-probability sampling method. Purposive sampling was used in the selection of the health facility (MP Shah hospital) as a case study. Simple random sampling was used in the selection of patients who sought medical care in this health facility. According to Kothari (2009) probability sampling approaches are instrumental in selection of respondents from which every member within the given sample population has the ability of being selected. The small sample size of the population can be instrumental in providing quality information depending on the aim, quality of dialogue, sample specificity, and analysis strategy (Boddy, 2016; Hennink & Kaiser, 2022; Malterud et al., 2016).

3.6. Data Collection Methods

A structured questionnaire was shared with patients who visited MP Shah Hospital for outpatient services and patients who gave consent to take part in the study. The respondents were selected through a random sampling method therefore each patient had a chance to participate in the survey. This questionnaire captured questions on the sociodemographic factors of the patients, level of awareness, knowledge, and perceptions towards telemedicine, and the types of medical care they preferred. This study mostly focused on patients who seek services in MP Shah Hospital, a facility that also provides telemedicine services to its patients. The study was conducted between April and May 2022. The questionnaire was uploaded on an online platform (Google forms) and the link was distributed to patients seeking care in the facility.

3.7. Data Analysis

Descriptive statistics was conducted through frequencies and percentages and inferential statistics was conducted through Pearson chi-square and regression analysis to capture correlations between the variables. The level of statistical significance was set at $p < 0.05$. This study intends to utilize IBM SPSS[®] software version 26 in analyzing the quantitative data. Descriptive statistics were analyzed through the use of frequencies, percentages, and means. Inferential statistics were analyzed through the use of correlation and regression

analysis. A chi-square analysis was conducted to capture the associations between the variables in the study.

Linear regression was used in enabling the generation of the regression of the equation. The regression model was

$$Y=X_1B_1+X_2B_2+X_3B_3+X_4B_4\dots\dots+e$$

Where:

Y=predictor variables (Adoption of telemedicine)

X₁= Awareness

X₂= Perception

X₃= Technological barriers

X₄= Preference for medical care

B=coefficients

e=error

3.8. Pilot Study

A pilot study was conducted in Aga Khan among patients using telemedicine in the health facility. A total of 15 respondents was used in improving the validity and reliability of the data collection instrument.

3.9. Research Quality

3.9.1. Validity

Validity is the degree to which a particular concept is accurately represented in a study. In essence, all questions in a survey must be accurately presented and must be valid considering what is being investigated or explored. This study relied on content validity

which focuses on whether the content in the survey is adequately presented. The researcher ensured that the research instrument covers all spheres associated with a particular variable that it was designed to measure (Heale & Twycross, 2015).

3.9.2. Reliability

Reliability relates to the consistency of a particular measure of consistency associated with a questionnaire. This study relied on the Lee Cronbach's α which determines the internal consistency of the research instrument. This was determined by calculating an average of all the correlations in every combination. The Cronbach's α result varies between 0 and 1 with a high score representing a higher extent of reliability. Usually, a Cronbach Alpha result of 0.7 and above is considered an appropriate threshold that was used in the study. A Cronbach alpha of .81 was captured which revealed the study instrument was reliable. (Heale & Twycross, 2015).

3.10. Ethical Issues in Research

Before conducting the research, approval was acquired from the Institutional Research and Ethics Committee. Consent was also sought from the National Commission for Science. MP Shah Hospital Ethical Review committee gave a written approval to conduct the study. An introduction letter was provided in MP Shah before the initiation of the study. The respondents were assured of their confidentiality and no form of identification was used when conducting the study. All respondents were required to consent to the study before participating in the study.

4. CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1. Introduction

This section provides information on the results and provides an interpretation of the analysis conducted.

4.2. Response Rate

Total number of the respondents interviewed were 152, indicated the response rate of 100% response rate.

4.3. Socio-demographic characteristics

Majority of the respondents were male, n=85 (55.92%), within 52.08% of them having used telemedicine. Most of the participants were between age 31-40 years (45.39%), among them 54.17 % have used telemedicine. About, 49.34% of the participants were graduate, with 54.17% of the leading in the used of the telemedicine as indicated in table 4.1

Table 4.1: Socio-demographic Characteristics

Factor	Category	Used telemedicine	
		Yes (48) n (%)	No (104) n (%)
Gender	Male	25(52.08)	60(57.69)
	Female	23(47.92)	44(42.31)
Age in Years of the respondents	18 – 30 Years	13(27.08)	23(22.12)
	31 – 40 Years	26(54.17)	43(41.35)
	41 – 50 Years	7(14.58)	27(25.96)
	51 – 60 Years	2(4.17)	8(7.69)
	Above 60 years	0(0)	3(2.88)
Level of education of the respondents	Certificate	1(2.08)	8(7.69)
	Diploma	8(16.67)	20(19.23)
	Graduate	26(54.17)	49(47.12)
	Postgraduate	13(27.08)	27(25.96)

4.4. Findings

4.4.1. The role of awareness on adoption of telemedicine in Nairobi County

Table 4.1 indicates that for every increase in one unit of moderate awareness there is a 0.970 increase use of telemedicine ($p=0.000$) while for every one-unit increment of high awareness of the respondents there 1.244 increase in the use of telemedicine ($p=0.000$).

Table 4.1: Bivariate analysis on Awareness

Awareness	Coefficient	Std.error	Z-values	P-values	95% Confidence Interval	
Low	ref					
Moderate	0.970	0.269	3.610	0.000	0.444	1.497
High	1.244	0.281	4.430	0.000	0.694	1.793
Constant	-1.142	0.190	-6.010	0.000	-1.514	-0.770

4.4.2. The role of perception on adoption of telemedicine in Nairobi County

Table 4.2 indicates that for every increase in one unit of better perceptions there is a 0.694 increase in use of telemedicine ($p=0.015$) while for every one-unit increment of good perceptions among the respondents there is a 1.101 increase in the use of telemedicine ($p=0.000$).

Table 4.2: Bivariate analysis on perception

Perceptions	Coefficient	Std.error	Z-values	P-values	95% Confidence Interval	
Poor	Ref					
Better	0.694	0.284	2.44	0.015	0.137	1.250
Good	1.101	0.260	4.24	0.000	0.592	1.611
Constant	-1.049	0.187	-5.62	0.000	-1.415	-0.683

4.4.3. The role of technological enablers on adoption of telemedicine in Nairobi County

Table 4.3 indicates that for every increase in one unit of moderate use of technology there is a 0.894 increase use of telemedicine (p=0.001) while for every one-unit increment of high technology used by the respondents there is a 0.803 increase in the use of telemedicine (p=0.002).

Table 4.3: Bivariate analysis on Technology

Technology	Coefficient	Std.error	Z-values	P-values	95% Confidence Interval	
Low	Ref					
Moderate	0.894	0.278	3.22	0.001	0.349	1.438
High	0.803	0.256	3.14	0.002	0.302	1.304
Constant	-0.967	0.176	-5.5	0.000	-1.312	-0.623

4.3.4 The role of preference of Medical Care on Telemedicine adoption

About 56.29% of the respondents preferred face-to-face medicine while on other hand only 7.28% of the respondents preferred the hybrid method of medicine as shown in figure 4.2

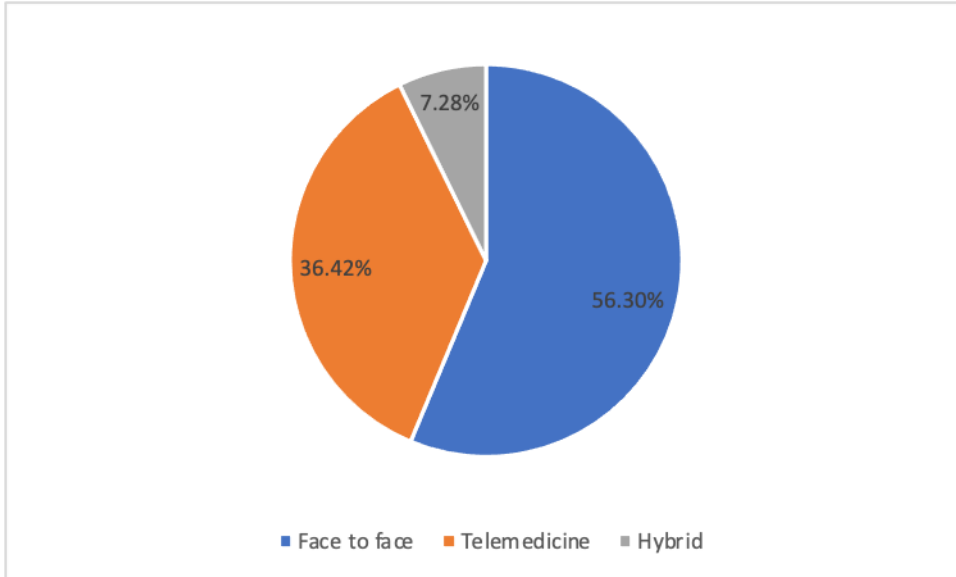


Figure 4.1: Proportion of the respondent's preference

4.4.6 The role preference of medical care among patients

Table 4.4 indicate that for every increase in one unit of the telemedicine method there is a 0.554 increase use of telemedicine ($p=0.015$) while for every one-unit increment of the hybrid method there is a 0.875 increase in the use of telemedicine ($p=0.032$).

Table 4.4: Bivariate Analysis on Preference

Preference	Coefficient	Std.error	Z-values	P-values	95% Confidence Interval	
Face-Face	ref					
Telemedicine	0.554	0.228	2.43	0.015	0.107	1.000
Hybrid	0.875	0.408	2.14	0.032	0.075	1.674
Constant	-0.760	0.151	-5.03	0.000	-1.057	-0.464

4.4.4. Influence of knowledge on adoption of telemedicine in Nairobi County

Table 4.5 indicates that for every increase in one unit of better knowledge there is a 1.029 increase use of telemedicine ($p=0.001$). for every one-unit increment of good knowledge of the respondents there 1.264 increase in the use of telemedicine.

Table 4.5: Bivariate Analysis of Knowledge

Knowledge	Coefficient	Std.error	Z-values	P-values	95% Confidence Interval	
Poor	Ref					
Better	1.029	0.300	3.43	0.001	0.441	1.617
Good	1.264	0.297	4.25	0.000	0.681	1.847
Constant	-1.314	0.239	-5.51	0.000	-1.782	-0.847

4.5. [NM1] Multivariate probit regression analysis

4.5.1. Multivariate Probit Analysis of Awareness

In probit, multiple regression analysis was conducted backward stepwise. This was done by running all the variables significant to the model, then the variable with the highest p-value was eliminated one after another one until the p-value of the remaining variables are below 0.200. From here we include the reference to running variables and the re-run model. The results depicted that for every increase in one unit of better knowledge there is a 1.469 increase use of telemedicine ($p=0.001$) whilst for every one-unit increment of good knowledge of the respondents there 1.358 increase in the use of telemedicine. Table 4.6 indicate that for every increase in one unit of moderate awareness there is a 0.697 increase use of telemedicine ($p=0.023$) while for every one-unit increment of high awareness of the respondents there 0.891 increase in the use of telemedicine ($p=0.011$). The result shows that knowledge and awareness are key factors associated with adoption of telemedicine. This shows that the patients need to have knowledge and be aware of telemedicine to enable the adoption of telemedicine.

Table 4.6: Multivariate Probit Analysis of Awareness

Study variables	No	Yes	Bivariable analysis			Multivariable analysis				
			Coefficient.	95% Confidence Interval		P-value	Coefficient.	95% Confidence Interval		P-value
Knowledge	n(%)	n(%)								
Poor	48(46.15)	5(10.42)	ref							
Better	30(28.85)	19(39.58)	1.029	0.441	1.617	0.001	0.844	0.218	1.469	0.008
Good	26(25)	24(50)	1.264	0.681	1.847	<0.001	0.677	-0.004	1.358	0.051
Awareness										
Low	62(59.62)	9(18.75)	ref							
Moderate	25(24.04)	19(39.58)	0.970	0.444	1.497	<0.001	0.697	0.094	1.300	0.023
High	17(16.35)	20(41.67)	1.244	0.694	1.793	<0.001	0.831	0.193	1.470	0.011

4.5.2. Multivariate Probit Analysis of Perception

No significant relationship was captured between perception and adoption of telemedicine

Table 4.7: Multivariate Probit Analysis of Perception

Study variables	No	Yes	Bivariable analysis			Multivariable analysis				
			Coefficient.	95% Confidence Interval		P-value	Coefficient.	95% Confidence Interval		P-value
Perceptions	n(%)	n(%)								
Poor	58(55.77)	10(20.83)	ref							
Better	23(22.12)	13(27.08)	0.694	0.137	1.250	0.015	0.407	-0.239	1.054	0.217
Good	23(22.12)	25(52.08)	1.101	0.592	1.611	<0.001	0.581	-0.036	1.198	0.065

4.5.3. Multivariate Probit Analysis of Technological Enablers

No significant relationship was captured between technological enablers and adoption of telemedicine

Table 4.8: Multivariate Probit Analysis of Technological Enablers

Study variables	No	Yes	Bivariable analysis			Multivariable analysis			
			95% Confidence Interval		P-value	95% Confidence Interval		P-value	
Technology	n(%)	n(%)	Coefficient.	Interval	P-value	Coefficient.	Interval	P-value	n(%)
Low	60(57.69)	12(25)	ref						
Moderate	18(17.31)	16(33.33)	0.894	0.349	1.438	0.001			
High	26(25)	20(41.67)	0.803	0.302	1.304	0.002			

4.5.4. Multivariate Probit Analysis of Preference of Medicare

No significant relationship was captured between preference of medicare and adoption of telemedicine

Table 4.9: Multivariate Probit Analysis of Preference of Medicare

Study variables	No	Yes	Bivariable analysis			Multivariable analysis			
			95% Confidence Interval		P-value	95% Confidence Interval		P-value	
Preference	n(%)	n(%)	Coefficient.	Interval	P-value	Coefficient.	Interval	P-value	n(%)
Face-Face	66(64.08)	19(39.58)	ref						
Telemedicine	32(31.07)	23(47.92)	0.554	0.107	1.000	0.015			
Hybrid	5(4.85)	6(12.5)	0.875	0.075	1.674	0.032			

5. CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1. Introduction

This section provides a discussion of the findings as per the objectives of the study followed by conclusions and recommendations. It will also capture the limitations and suggestions for further research.

5.2. Discussion

5.2.1. The influence of Awareness on the Adoption of Telemedicine

Concerning the first objective, the bivariate analysis captured a significant relationship between knowledge and awareness and the adoption of telemedicine. The analysis revealed that for every increase in one unit of moderate awareness there is 0.970 increased use of telemedicine while for every one-unit increment of high awareness of the respondents there 1.244 increase in the use of telemedicine. Similarly, for every increase in one unit of better knowledge, there is a 1.029 increase use of telemedicine and for every one-unit increment of good knowledge of the respondents there 1.314 increase in the use of telemedicine. Further, a multivariate analysis was conducted that revealed that for every increase in one unit of better knowledge there is a 1.469 increase use of telemedicine ($p=0.001$) whilst for every one-unit increment of good knowledge of the respondents there 1.358 increase in the use of telemedicine. Additionally, for every increase in one unit of moderate awareness, there is a 0.697 increase use of telemedicine while for every one-unit increment of high awareness of the respondents there 0.891 increase in the use of telemedicine. Based on the diffusion of innovation theory, these results depict that, knowledge and awareness improve the adoption of technology as elaborated in the theory.

These results relate to a study conducted by Ashfaq et al. (2020) who revealed that the adoption of telemedicine among patients could only be reinforced by improving the extent of knowledge and information on telemedicine. Similarly, Parimbelli et al. (2018) note that the adoption of telemedicine is influenced by the extent of knowledge and awareness that patients have of telemedicine. In essence, patients require more information on how to maneuver through the systems which would in turn improve their confidence and adoption of the systems.

Another study also focused on investigating the factors that influence the adoption of telemedicine services among a rural population in Pakistan. Data was collected through the use of face-to-face surveys that captured 275 respondents. The study revealed that most of the respondents intended to use telemedicine services. However, factors such as perceived ease of use, perceived usefulness, facilitating conditions, perceived risk, and technological anxiety all posed a major challenge to the adoption of telemedicine. Therefore, the researchers recommended a need to increase the extent of knowledge and awareness as an approach to dealing with these concerns (Kamal et al., 2020). However, these results conflict with a study conducted by Cegarra-Sanchez et al. (2020) who explored the role of knowledge in enabling the adoption of telemedicine among patients. Data was captured from survey data that captured 252 healthcare end-users and the information was analyzed through the use of the ADANCO software.

Results captured from the study revealed that as opposed to improving the level of awareness and knowledge on the adoption of telemedicine, it was important to explore the importance of effective inquiry and dialogue as effective approaches to improving the adoption and utilization of telemedicine technology. In essence, patients require more information on telemedicine which would then improve their knowledge and in turn contribute to its adoption. This translates to the technology acceptance model that stipulates that increased access to information is directly associated with human competence. Additionally, reluctance to accept to use a particular technology by user is mostly linked with limited information on its usefulness and value (Priyanka & Kumar, 2013).

5.2.2. The role of Perception in Adoption of Telemedicine

The bivariate analysis between perception and adoption of telemedicine revealed that for every increase in one unit of better perceptions there is a 0.694 increase in the use of telemedicine while for every one-unit increment of good perceptions among the respondents there is a 1.101 increase in the used of telemedicine. No significant relationship was reflected in the multivariate analysis.

These results are similar to a study conducted by Lee et al. (2018) which investigated the perception of patients towards the use of telehealth for Type 2 diabetes management. Semi-structured interviews were conducted which captured 10 patients based in London, UK. The predominant themes were captured from findings which revealed that empowerment, technology consideration, and the perception of the services were all key in influencing the adoption of telemedicine. Additionally, the patients also perceived telehealth to be critical in enhancing people's overall quality of life and enabling them to be in control of their health.

Fritz et al. (2021) focused on capturing the patient's perception of telehealth physical therapy among patients affected with chronic low back pain. The study captured both patients and health care workers. A total of 102 participants were captured who openly described a willingness to use telehealth. However, the results also showed that there was a need to provide education and training to ensure that patients were more familiar with the telehealth therapy infrastructure. Smith & Raskin (2021) also note that improving the extent of health equity among the general population is dependent on how existent challenges are controlled and managed. The study reveals that there is a need to deal with the perception of patients especially those surrounding the infrastructure and the legislature of telemedicine. Bunnell et al. (2020) also focused on understanding the factors associated with the usage of telemedicine among the respondents. An online survey was used for data collection to capture the features that contribute to the intention to use telemedicine. The respondents perceived telemedicine to be instrumental in enabling them with proper work-life balance, flexibility in inaccessibility of care, and the opportunity to use innovative care.

These results coincide with the technology acceptance model by capturing the significance of the perception of the patients on adoption of telemedicine. This theory stipulates that the perceived usefulness of a technology is directly associated with the belief or the depiction of its value in dealing with what they truly need. Secondly, the perceived ease of use is linked with the complexity of the system or the level of exposure of the system value (Priyanka & Kumar, 2013). In essence if the patients perceive telemedicine as useful or easy to use then they will adopt telemedicine.

5.2.3. The role of Technological Enablers in Adoption of Telemedicine

The bivariate analysis revealed that for every increase in one unit of moderate use of technology there is a 0.894 increase use of telemedicine while for every one-unit increment of high technology used by the respondents there is a 0.803 increase in the use of telemedicine. The multivariate analysis captured no significant relationship between technological enablers and the adoption of telemedicine among the respondents.

These findings relate to a study conducted by Bhaskar et al. (2020) which revealed that there is a need to improve the telehealth networks which would improve the process of decision making, improve the capability of the systems, and improves the extent of innovation. Two of the key issues that limit the adoption of telemedicine include infrastructural reasons and cost-benefit concerns. Shannon et al. (2022) focused on evaluating the staff attitudes and the factors associated with the rapid implementation of these systems. A survey was used in the collection of data that captured 134 respondents. The most common technological barriers were noted as unreliable internet connectivity and having the appropriate equipment.

Korot et al. (2022) also note that telemedicine has rapidly been expanding in terms of its capabilities but one major concern is its effective deployment. The focus of their study was to explore the relationship between patient characteristics and adoption and engagement of telemedicine. A cohort and survey design was adopted in the study which captured 417 respondents. The study showed that issues such as digital exclusion (such as access to smartphone handsets) posed a major threat to the adoption of telemedicine among patients. Al-Samarraie et al. (2020) also focused on reviewing the progress

associated with the usage and adoption of telemedicine in Middle Eastern countries. Data was collected through a systematic review of literature that captured 43 articles between 2010 and 2020 that focused on telemedicine. The study revealed that technological factors such as lack of information on technology training, poor system, and poor infrastructure were all associated with poor adoption of telemedicine services among patients.

Priyanka & Kumar, (2013) also captured no significant association between technological enablers and the adoption of telemedicine among the respondents. In relation to the technology acceptance model, enabling factors such the system quality, security, design, operation, maintenance, user friendliness and interface are critical in enabling the adoption new technology In relation to the study, these factors could have played a critical role in the adoption of telemedicine among the patients.

5.2.4. The role Preference of Medical Care among Patients on Adoption of Telemedicine

The bivariate analysis revealed that for every increase in one unit of telemedicine method there is a 0.554 increase use of telemedicine while for every one-unit increment of hybrid method there is a 0.875 increase in the use of telemedicine. There was no significant relationship captured between the preference for medical care and the adoption of telemedicine in the multivariate analysis. A study conducted by Wernhart et al. (2019) revealed focused on capturing the factors that are associated with the adoption and adoption of telemedicine. Data was collected through the use of structured questionnaires that captured 905 participants. The results revealed that most of the respondents preferred face-to-face forms of medical care. Some of the key reasons for relying on this approach were that they are easier and are considered more secure.

Another study focused on capturing the extent of knowledge, attitude, and awareness that is associated with telehealth services in Libya. The study adopted a cross-sectional design approach that captured 673 respondents. The results captured from the study were mostly influenced by the occurrence of the COVID-19 pandemic. A majority of the respondents preferred to rely on telemedicine as it reduced their fear of being affected by the disease

and it was convenient in terms of reducing the associated costs of seeking healthcare (Elhadi et al., 2021). These findings are contradictory to a study conducted by Basaran et al. (2020) which revealed that most respondents had face-to-face interactions which made it easier for assessment. However, the respondents also believed that telemedicine was instrumental but only for follow-up. According to Bokolo, (2021) most patients prefer telemedicine and other virtual applications and software. This was because they are associated with a reduced risk of infection and limited the number of visits that an individual made to the emergency department.

5.2.5. Theoretical implications

This study found a significant relationship between knowledge and awareness and the usage of telemedicine. This means that an individual with knowledge or has awareness on the existence of telemedicine is more likely to improve their chances of adoption or adoption. Parimbelli et al. (2018) notes that knowledge on how telemedicine works and its associated benefits are instrumental in encouraging adoption among patients. This also relates to a study conducted by Yamin & Alyoubi (2020) who notes that resistance towards the adoption of telemedicine is usually associated with limited levels of knowledge and awareness on its associated risks and benefits. Additionally, being aware or having knowledge on telemedicine is relatively insufficient. Patients also to be educated and provided with vital information on the legal aspects associated with telemedicine (Ashfaq et al., 2020). According to Kamal et al. (2020) the usage and adoption of telemedicine is associated with a variety of factors such as trust, perceived risk, technological anxiety and social influence all which are linked with knowledge and awareness on the existence of the systems.

On the second objective, the study found a significant relationship between telemedicine adoption and the perception of the patients in the bivariate analysis however no significant relationship was captured in the multivariate analysis. Negative perceptions on telemedicine can limit the adoption of telemedicine while positive perceptions improve its adoption. According to Zobair et al. (2020), there are a variety of factors that contribute to the adoption of telemedicine such as trustworthiness of the system, patient

satisfaction and effectiveness of the system which results to different perceptions on the adoption of telemedicine. Wernhart et al. (2019) also notes that patients have different perceptions that influence the adoption of telemedicine such as its role in improving the doctor-patient relationship and the impact on privacy and security of their information.

The third objective focus on the role of technological enablers on the adoption telemedicine adoption. A positive relationship was captured between technological enablers and telemedicine adoption in the bivariate and multivariate analysis. This means that the presence of adequate technological infrastructure are vital as they ensure the operation of telemedicine which in turn improves the adoption. Al-Samarraie et al. (2020) notes that factors such as poor levels of funding, poor technological infrastructure, poor system quality and limited training on information technology have a significant impact on the adoption of telemedicine. Rao et al. (2020) also notes that compliance factors, patient education and technological considerations play a significant role in the adoption of telemedicine.

The fourth objective focused on the role of preference of medical care on the adoption of telemedicine. A positive relationship was captured between preference of medical care and adoption of telemedicine. Additionally, a majority of the patients preferred face-to-face care compared to telemedicine. Therefore, telemedicine has its set of challenges that impacts its adoption with one major concern being preference of medical care. Currently, only few patients understand the benefits of telemedicine owing to limited adoption of the technology. Most patients still prefer face-to-face form of care as opposed to telemedicine given its ease and privacy. However, Bokolo, (2021) notes that the occurrence of COVID-19 significantly increased the adoption of telemedicine.

5.3. Conclusion

There is a need to increase the extent of knowledge and awareness of telemedicine services which would in turn improve its adoption. Similarly, there are varied perceptions that focus on the pros and cons of telemedicine services. As such, there is a need to increase the extent of sensitization to improve the perceptions of telemedicine. Technological enablers such as the equipment, connectivity, and telemedicine framework

are all key in improving their usability and acceptability. Preferences for telemedicine adoption are relatively varied but there is a need to incorporate multiple approaches to ensure effective telemedicine services.

5.4. Recommendations

There is a need to increase the extent of sensitization on the adoption of telemedicine to improve the extent of knowledge and awareness. Additionally, there is a need to improve the infrastructure of telemedicine which would be instrumental in improving its adoption. The government should employ different approaches such as developing policies and setting aside sufficient funds to improve the adoption of telemedicine.

5.5. Limitations of the Study

The study is mostly focused on a health facility that already has a working telemedicine infrastructure as such it does not capture the situation of other health facilities with poor infrastructures.

5.6. Suggestions for Further Research

There is a need to focus on patients attending public health facilities to capture the true nature of the situation in terms of the adoption and adoption of telemedicine in Nairobi County.

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APPENDICES

Appendix A: Questionnaire

Introduction

Telemedicine is the use of electronic information and communications technologies to provide and support health care when distance separates the participants. On the commonplace side of the spectrum are familiar uses of the telephone for consultations between patients and clinicians and the use of radio to link emergency medical personnel to medical centers. On the other end of the telemedicine, spectrum is largely experimental innovations such as telesurgery in which a surgeon receives visual and tactile information to guide robotic instruments to perform surgery at a distant site. In between these two ends of the spectrum lie an array of video, audio, and data transmission technologies and applications. Some, such as relatively expensive interactive video conferencing, allow clinicians to see, hear, examine, question, and counsel distant patients for "real-time" diagnostic and therapeutic purposes.

SECTION A: SOCIO-DEMOGRAPHIC FACTORS						
This section collects the socio-demographic information of research participants, all data is strictly confidential.						
1.	Gender	Male				
		Female				
2.	Age					
3.	Level of education	Certificate				
		Diploma				
		Graduate				
		Postgraduate				
4.	Have you ever used telemedicine	Yes				
		No				
SECTION B: KNOWLEDGE AND AWARENESS						
This section collects data on participant knowledge and awareness of telemedicine in practice						
KNOWLEDGE						
Please assess your general understanding of the below ICT operational area. Use the following scale to rank the level of knowledge: 5 = Excellent, 4 = Very good, 3= Good, 2= Weak, 1= No knowledge and understanding						
		1	2	3	4	5
1.	How would you rate your overall knowledge of Telemedicine use					
2.	Use of mobile and computer applications					
3.	Internet use e.g. Use of computer browsers to access web pages					
4.	To what extent are you familiar with telemedicine (process and benefits)?					
5.	To what extent are you familiar with telemedicine applications and platforms within the country?"					
AWARENESS						
Use the provided scale: (1 = Strongly disagree, 2=Disagree, 3=Don't know, 4=Agree, 5=Strongly Agree)						
		1	2	3	4	5
	Telemedicine is part of medical technology					
	Face to face interaction between patients and doctors is possible through telemedicine					
	Telemedicine provides health care services where distance is a problem.					
	Images can be transmitted to a remote specialist for					

consultation						
Telemedicine helps in reducing the cost of service						
There are existing telemedicine applications in the country that can be easily adopted						
1.	Telemedicine is relatively easy to use.	Strongly disagree				
		Disagree				
		Neutral				
		Agree				
		Disagree				
2.	How do we empower patients, care partners, and clinicians with telehealth literacy?	Pay attention to video framing to include arms and torso, incorporating hand gestures and posture into non-verbal communication.				
		Observe digital body language and non-verbal cues, and utilize the power of the pause in natural conversation exchange to engage the patient during the virtual visit.				
		Practice active listening, allowing the patient to narrate their story while encouraging dialog, and use the teach-back method to confirm that both the patient and clinician share the same understanding				
		In the absence of a traditional physical examination, taking the time to listen to the patient's history				
3.	Other please specify					
4.	How do we empower patients, care partners, and clinicians with telehealth literacy?	Invest in pre-visit preparation for both patients and clinicians. This may include a test visit for navigating the hardware and software interface, as well as upfront agenda-setting				
		Address privacy concerns with patients and offer suggestions for safer spaces.				
		Provide educational opportunities for clinicians to learn unique telehealth skills such as website manner, health literacy skills, and advanced, clinician-directed, patient-performed virtual exam maneuvers.				
		Recognize that health inequities may be				

		exacerbated without an assessment of a patient's needs, readiness, and proper support provided in the context of his or her life				
5.	Others (please specify)					
SECTION C: TECHNOLOGICAL ENABLERS						
This section collects data on technology enablers for telemedicine within the participant domain						
To what extent do you agree with the below statements Use the following scale to rate: 5= Strongly agree 4=agree 3=Neutral 2=Disagree 1=Strongly disagree						
		1	2	3	4	5
1.	Have access to computers and smartphones daily					
2.	The network is available and strong in the area					
3.	There is a Local Area Network (LAN) in the area					
4.	You have strong internet access					
5.	DO you have technical support staff, who guides on the use of the system and supports resolving any system technical challenge?	Yes				
		No				
SECTION D: PERCEPTION OF TELEMEDICINE						
This section collects data on participant perception of telemedicine in practice						
Rate the extent to which perception affects the use of telemedicine. Use the following scale: 5= Strongly agree 4=agree 3=Neutral 2=Disagree 1=Strongly disagree						
		1	2	3	4	5
1.	I am willing to learn about telemedicine					
2.	I will be able to fix the system if something isn't working					
3.	Using a computerized system is easy and reliable and I am willing to use it during daily operations					
4.	I fear using the telemedicine will compromise the security of patient data					
5.	Using telemedicine is a lot of work					
6.	Telemedicine is convenient and helps save health-related costs					
Rate how the following factors influence adoption of telemedicine . Use the following scale: 5 = extremely difficult 4= difficult 3=somehow complicates						

2 = minor impact 1 = no impact at all						
		1	2	3	4	5
1.	Lack of support from health facility administration					
2.	Lack of proper security mechanisms and privacy issues					
3.	Telemedicine doesn't meet the health facility's needs					
4.	Health care providers do not have the required skills to use telemedicine					
5.	Lack of expertise/skill in telemedicine among health workers					
SECTION E: PREFERENCE FOR MEDICARE						
This section collects data on participant preference between telemedicine and in-person care						
1.	Which form of medical care do you prefer?	telemedicine				
		Face-to-face				
2.	What are your reasons for selecting the above?					

Appendix B: Participant Information and Consent Form

TITLE OF THE PROPOSED STUDY:

TELEMEDICINE AS A MECHANISM FOR PROVIDING ACCESSIBLE MEDICAL CARE: WHAT ARE THE DETERMINANTS OF ITS ADOPTION BY PRIVATE HOSPITAL PATIENTS IN NAIROBI COUNTY?

SECTION 1: INFORMATION SHEET

Investigator: Sharon Ndinda Mutuku

Institutional affiliation: Strathmore Business School (SBS)

SECTION 2: INFORMATION SHEET–THE STUDY

Why is this study being carried out?

To explore telemedicine as a mechanism of provision of accessible medical care by capturing the drivers and inhibitors associated with its adoption in Nairobi County

Do I have to take part?

No. Taking part in this study is entirely optional and you are entirely supposed to decide without coercion. If you decide to take part or consent to the study, you will be requested to fill in a questionnaire that seeks to investigate the reason for the low adoption of telemedicine. Telemedicine will be clearly defined on top of the questionnaire in a language and terminologies that you can understand. You are free to decline to take part in the study from this study at any time without giving any reasons.

Who is eligible to take part in this study?

Patients who have sought outpatient medical care at MP Shah Hospital, aged 18 years and above.

Who is not eligible to take part in this study?

Patients below 18 years

Patients who have not consented to the study

What will taking part in this study involve for me?

You will be approached by a research assistant and requested to take part in the study. If you are satisfied that you fully understand the goals behind this study, you will be asked to sign the informed consent form (this form) and then taken through a questionnaire to complete.

Are there any risks or dangers in taking part in this study?

There are no risks in taking part in this study. All the information you provide will be treated as confidential and will not be used in any way without your express permission.

Are there any benefits of taking part in this study?

The information will be used to improve health systems in providing quality and accessible healthcare services to the Kenyan citizens

What will happen to me if I refuse to take part in this study?

Participation in this study is entirely voluntary. Even if you decide to take part at first but later change your mind, you are free to withdraw at any time without explanation.

Who will have access to my information during this research?

All research records will be stored in securely locked cabinets. That information may be transcribed into our database but this will be sufficiently encrypted and password protected. Only the people who are closely concerned with this study will have access to your information. All your information will be kept confidential.

Who can I contact in case I have further questions?

You can contact me, Sharon Mutuku, at SBS, or by e-mail (Sharon.mutuku@strathmore.edu), or by phone (0723 404 679). You can also contact my supervisor, Dr. Joseph Onyango, at the Strathmore Business School, Nairobi, or by e-mail at jonnyango@strathmore.edu or by phone (0720 879 706). If you want to ask someone independent anything about this research please contact: The Secretary– Strathmore University Institutional Ethics Review Board, P. O. BOX 59857, 00200, Nairobi, email ethicsreview@strathmore.edu Tel number: +254 703 034 375

I _____ have had the study explained to me. I have understood all that I have read and have had explained to me and had my questions answered satisfactorily. I understand that I can change my mind at any stage.

Please tick the boxes that apply to you;

Participation in the research study

I AGREE to take part in this research

I DON'T AGREE to take part in this research

I AGREE to have my completed questionnaire stored for future data analysis

I DON'T AGREE to having my completed questionnaire stored for future data analysis

Participant's Signature: _____

Date: __/_____/____DD / MM / YEAR

Appendix C: Research Permit

REPUBLIC OF KENYA
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 587526

RESEARCH LICENSE



This is to Certify that Ms. Sharon NDINDA Mutuku of Strathmore University, has been licensed to conduct research in Nairobi, on the topic: **TELEMEDICINE AS A MECHANISM FOR PROVIDING ACCESSIBLE MEDICAL CARE: WHAT ARE THE DETERMINANTS OF ITS UPTAKE BY PRIVATE HOSPITAL PATIENTS IN NAIROBI COUNTY?** for the period ending: **18/March/2023.**

License No: NACDSTUP/22/16489

587526
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code



NOTE: This is a computer generated License. To verify the authenticity of this document, scan the QR Code using QR scanner application.

Appendix D: Facilitation of Research

Ole Sangale Rd, Madaraka Estate,
P.O Box 59857 00200, Nairobi, Kenya.
Cell: +254 703 414/6/7, Twitter: @SBSKenya
Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu



9th February 2022

To Whom It May Concern.

Dear Sir/ Madam.

RE: FACILITATION OF RESEARCH – SHARON NDINDA MUTUKU

This is to introduce Sharon Mutuku who is a Master of Business Administration student at Strathmore University Business School, admission number MBA/119959/20. As part of our MBA Program, Sharon is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MBA course. To this effect, she would like to request for appropriate data from your organisation.

Sharon is undertaking a research paper on “Telemedicine as a Mechanism for Providing Accessible Medical Care: What are the Determinants of its Uptake by Private Hospital Patients in Nairobi County” The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MBA seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Caroline Tiara".

Caroline Tiara.
Manager Graduate Programs.
Strathmore University Business School.

Appendix E: Introduction Letter



4th April 2022

Ms Mutuku Sharon,
sharon.mutuku@strathmore.edu

Dear Ms Mutuku,

RE: Telemedicine as A Mechanism for Providing Accessible Medical Care.

This is to inform you that SU-IERC has reviewed and **approved** your above **SU masters'** research proposal. Your application reference number is **SU-IERC1310/22**. The approval period **4th April 2022 to 3rd April 2023**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and obtain other clearances needed.

Yours sincerely,

for: **Dr Ben Ngoye,**
Secretary; SU-IERC

Cc: Prof Fred Were,
Chairperson; SU-IERC



Appendix F: MP Shah Approval Letter



M.P. SHAH HOSPITAL
A Legacy of Care

26th April, 2022

REF: MD2204008

Sharon Ndinda Mutuku
Strathmore University
Nairobi-Kenya

Dear Ms. Mutuku,

RE: APPROVAL FOR RESEARCH AT THE M.P SHAH HOSPITAL

I am pleased to inform you that your application for collecting data from M.P. Shah Hospital for your research project "Telemedicine as a Mechanism for providing Accessible Medical Care: What are the determinants of its Uptake by Private Hospital Patients in Nairobi County?" has been approved.

You may proceed to collect the data required and ask for assistance from our Home Based Coordinator if required. Kindly sign the attached Non-Disclosure Agreement.

I wish you all the best in your project and urge you to share your findings with us.

Yours sincerely,

Dr. Vishal Patel
MEDICAL DIRECTOR



Appendix G: Budget

No	Items	Cost
1	Stationery	10,000.00
2	Travelling	12,000.00
3	Typing & Printing	30,000.00
4	Photocopying & Binding	15,000.00
5	Analysis	45,000.00
6	Miscellaneous	7,000.00
	Total	119,000

Appendix H: Timeline

Month	Jan - Mar 2022	Apr 2022	April -May 2022	June - July 2022
Activity				
Chapter one writeup				
Chapter two and three writeup				
Proposal completion				
Collection of data				
Data analysis				
Chapter four and Five write-up				
Presentation of the final proposal				