UNIVERSITY OF KWAZULU-NATAL

Assessing the Implementation of Electronic Consultation in the Ghanaian Health Sector

By

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DEDICATION

To my lovely wife, Mrs. Agnes Nketia and children; Adeline Asaa Nketia, Joycelyn Oforiwaa Nketia, Evangeline Faustine Abena Nketia and Michelyn Tiwaa Nketia

ABSTRACT

The Covid-19 pandemic sparked the buzz word "e-consultation" because people preferred having medical attention remotely. The researcher carried out this study with the aim to help improve access to healthcare by identifying the key issues in the adoption and use of e-consultation in the Ghanaian Health Sector. The study evaluates how e-consultation systems influence the delivery of health care services in hospitals, assesses the attitudes of clinicians and patients towards e-consultation systems and provides a framework to enhance its usage. To assess the implementation of successful e-consultation, the researcher developed a conceptual model that bridged the Delone & Mclean's IS success model, and Rogers' Diffusion of Innovation Theory to form a suitable model for the study. The research utilized a sequential exploratory method, combining qualitative and quantitative methods to gain an in-depth understanding of the dynamics and challenges associated with e-consultation in the specific context of Ghana. The study found that the implementation of e-consultation is integrated in the internal hospital management system of very few hospitals. Hence most clinicians resort to using e-consultation informally with the help of WhatsApp video, Zoom, phone calls and other open source platforms.

Also, it was found that the attitudes of clinicians and patients towards e-consultation implementation is influenced by various factors that range from system quality, information quality, ease of use, connectivity, and education. Besides, the growing concern of privacy and data security issues shows that healthcare providers should strengthen the development of e-consultation information systems. It transpired that the Ministry of Health does not have a suitable policy on software standards for e-consultation. The poor regulatory framework is a major factor contributing to resistance to the use of e-consultation.

The rotated factor matrix extracted using the Principal Axis Factoring shows a high level of correlation and consistency among various factors under study. Attitude came first followed by Regulatory framework, acceptance and diffusion. The study, therefore, proposed a model for e-consultation implementation which would help regularize the implementation of e-consultation as well as enhancing the rate of diffusion of e-consultation, its adoption and usage by hospitals and the public.

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CHAPTER ONE

INTRODUCTION

1.1 Background

E-health is defined as the organisation and delivery of health services and information using the internet and related technologies. In a broader sense, the term characterises not only a technical development, but also a new way of working, an attitude, and a commitment to networked, global thinking to improve healthcare locally, regionally, and worldwide by using information and communication technology (Gu, et al., 2021). One of the greatest opportunities of the 21st century is the potential to safely harness the power of the technology revolution to meet the challenges of improving health and providing better, safer, sustainable care for all. Internationally, chronic illness is common among older adults, with increasing prevalence as individuals age (Wang, Liu, Lam, & Gao, 2021). In view of this, electronic consultation is seen by many as at least a partial solution to the complex challenges of delivering healthcare to an aging and increasingly diverse population (Ezzat & Sood, 2021).

Today, Health Information Systems encompass a wide range of applications and services targeted at various users and purposes. Information systems play a key role in patient care—both stand-alone and integrated applications are widely implemented and adopted. As befits the broad adoption of healthcare ICT systems, healthcare providers invest considerable resources in these systems. According to the literature, new technology solutions in hospitals and healthcare centers are expected to improve the quality and efficiency of care (Kim & Song, 2022). However, the practical effects of new healthcare technology adaptation are manifold. For example, e-consultation adoption comes with ease of use juxtaposed with the processes

taken up by clinical documentation and record-keeping before a doctor is seen (Marshall, Shah, & Stokes-Lampard, 2018).

In July 2010, the Government of Ghana launched the national health strategy with a spotlight on e-consultation (MoH, 2023). The key strategies under the national e-health strategy include streamlining the regulatory framework for health data and information management, building sector capacity for wider application of e-health solutions in the health sector, increasing access and bridging the equity gap in the health sector through the use of Information Systems, and introducing a paperless records and reporting system.

Computer literacy in the general population, the availability of communication infrastructures and changes in government policies and increased support for clinical computing in particular, suggest that this trend is changing positively indicating an improvement and there is hope for clinical technological systems advancements (Dissanayake, 2022). Despite these potentials, there are barriers to the full implementation of e-health solutions, and the limitations of access, health and technology literacy, and pragmatic measures must be taken to address the challenges. Internet-based medical consultation might have an impact on individuals as well as on health care providers. In Ghana, the limited adoption of extensive integrated clinical information systems that support medical electronic consultation between doctors and patients has resulted in congestion of the outpatient departments (OPD) in the hospitals with numerous people queueing to see a medical professional, mounting pressure on hospital facilities. Nonetheless, there are societal and clinical barriers to the adoption of information systems in the Ghanaian health sector, such as negative attitudes, lack of knowledge, role adjustments

related to the disruption of traditional work habits, and changes in established work roles (Mohanty, 2020; Peprah, Abalo, & Agyemang-Duah, 2020).

Thus, it is crucial to understand the opportunities and the limitations of this new method of consulting a doctor, the use of such a service, and the perspectives of the physicians carrying out the consultations. Ghana has few medical facilities that make use of e-consultation; therefore, this study investigates e-consultation systems implemented by these facilities and provides a better framework that could be implemented nationwide.

1.2 Problem statement
Although e-health systems offer numerous benefits, their adoption is accompanied by several challenges, including a lack of funds, inadequate healthcare policies and procedures, low internet bandwidth, and concerns about confidentiality and security (Nureni & Van der Vyver, 2019). E-health implementation in rural areas is hindered by insufficient health systems. Generally, the quality of health facilities in rural areas is perceived to be inferior to that of urban settings. In Ghana, patients in rural areas face numerous challenges, such as difficulties in obtaining health records promptly, an unequal distribution of specialist healthcare professionals, transportation costs, inadequate facilities in lower-level hospitals, and limited access to state-of-the-art medical equipment (Appiah, et al., 2020; Acquah-Hagan, 2021).

Consequently, critics lament the prevalence of negative experiences with healthcare systems and the inadequacy of these systems in supporting clinicians' daily work (Wu, et al., 2020). E-consultation can be examined from three different perspectives: clinical, technological, and societal. Electronic consultations offer potential advantages to patients, sparing them the cost and inconvenience of traveling. In practical terms, although some systems are already in place

in the Ghanaian healthcare sector for executing administrative tasks such as billing, scheduling, and inventory management, there is limited adoption of extensive integrated clinical information systems that support medical electronic consultation between doctors and patients. This situation results in congestion of outpatient departments (OPD) in hospitals, with many people queueing to see a medical professional, and increasing pressure on hospital facilities.

Moreover, patients' biodata is a valuable information source that requires critical attention and confidentiality. Thus, when introducing an e-consultation solution, the human element must also be considered (Robblee & Starling, 2020). E-consultation adoption is not solely a financial issue but also involves human trust. Review studies have highlighted serious challenges in the adaptation and development of information systems (Jalghoum, 2019; Ye, Zhou, & Wu, 2020), and in evaluating the evidence on the benefits, savings, and costs of adopting healthcare IT (Crisan & Mihaila, 2021). For instance, some of the challenges identified in Ghana are consistent with those found in the systematic literature review by Peprah, Abalo, & Agyemang-Duah (2020), which reveals the following societal and clinical barriers to information systems adoption in e-consultation: negative attitudes, lack of knowledge, role adjustments related to the disruption of traditional work habits, and changes in established work roles.

The adoption of e-consultation in Ghanaian healthcare is not without system challenges. These challenges align with those identified by health information systems researchers, which indicate the most significant barriers to the adoption and use of healthcare information systems include concerns about the time required to use the system (Hossain, Quaresma, & Rahman, 2019), efficiency (Gajarawala & Pelkowski, 2021), user support (Bagayoko, et al., 2020), system functionality (Parthasarathy, 2021), confidentiality of patient information (Almaghrabi & Bugis, 2022; Rudrapati, 2022) and dehumanisation of patient contact (Fristedt, 2021). The

success factors for an e-consultation system would be the opposite of some of these challenges: ease of use, no increase in workload, and timely, precise information (Tim, Monique, & Candice, 2018; Abid, Mohd, Ravi, & Rajiv, 2021).

Medical electronic consultation systems aim to improve health professionals' and organizations' functioning in managing health and delivering healthcare. Given the importance of this type of intervention and the intended beneficial effects on patients and professionals, it is crucial to conduct this study. The goal is to achieve optimal results and identify any unanticipated outcomes that could help improve the Ghanaian healthcare system. By understanding the barriers and success factors, this research can contribute to the development of a more effective e-consultation framework, addressing the challenges faced in rural areas and promoting the widespread adoption of e-consultation systems throughout the country. Ultimately, the outcomes of this study may lead to enhanced healthcare delivery, reduced congestion in outpatient departments, and an overall improvement in patient and healthcare professional experiences.

1.3 Main Purpose of Study
The main purpose of this study is to enhance access to healthcare in Ghana by investigating the key issues associated with the use of e-consultation. The research aims to evaluate how e-consultation systems affect the delivery of healthcare services in hospitals and the impact on people who use these services. The study intends to identify the challenges and opportunities in implementing e-consultation systems and develop a framework that could be implemented nationwide to improve healthcare delivery. By exploring the perspectives of healthcare professionals and patients, the study seeks to provide insights into the barriers to e-consultation adoption and the potential benefits of these systems. Ultimately, the goal of this study is to

contribute to the improvement of the Ghanaian healthcare system and promote better healthcare outcomes for all.

1.4 Research Objectives
The research objectives of the study are:

a) To examine the factors that influence the adoption of e-consultation in the Ghanaian healthcare system and their significance in system development, deployment, and usage.

b) To evaluate how the implementation of an e-consultation technology framework influences its acceptance in Ghana.

c) To identify the challenges associated with e-health systems, with a special focus on people's awareness and acceptance of e-consultation in the healthcare sector in Ghana.

d) To provide recommendations for promoting the use of e-consultation systems in Ghana and developing a framework that could be implemented nationwide to improve healthcare delivery.

1.5 Research Questions
The primary research question is, "How do the technological and institutional framework, and societal, and clinical factors influence the successful implementation of e-consultation?" This is further sub divided into four sub-questions:

a) Why must the attitude of the public be considered in the implementation of e-consultation in Ghana?

b) How do the attitudes of clinicians and hospital staff affect the implementation of e-consultation in a regular clinical setting in Ghana?

c)   What factors should be considered in e-consultation systems development, deployment and usage in Ghana?

d)   How does the implementation of e-health technology framework influence the acceptance of e-consultation in Ghana?

1.6 Significance of Contribution

The primary motivation is to fill a gap in the literature in terms of systematic comparative international research into the evaluation of the impacts of IT/IS, e-consultation in particular, by making a theoretical and methodological contribution. The study also aims to contribute to the development of advice for public decision-makers by offering a better basis for practitioners and policymakers involved in the healthcare sector for an analysis of IT usage and its impacts on service delivery. The write-up will serve as reference material for many individuals for further studies. The outcome of the study will help the Ghanaian Government and the Ministry of Health to establish more e-health services, particularly for communities without sufficient medical facilities.

1.7 Justification

This study provides a framework for the effective implementation of medical e-consultation across Ghana. These guidelines may be generalized and applied to any other country with similar circumstances. The e-consultation implementation framework is based on identified issues that enhance acceptance and usage of e-consultation in Ghana. The study identifies the status of e-consulting within the Ghanaian healthcare system.

1.8 Research Methodology

This is an exploratory research using the multiple-case study method. The case study methodology is one of the most used qualitative research methods in technology management and information systems studies (Tönnissen & Teuteberg, 2020). The study employed surveys,

interviews, and analysis of documents. Data was collected from hospitals and patients within a selected geographical region in Ghana. The various cases studied allowed the researcher to compare and contrast the outcomes of the cases to draw logical conclusions. The study, therefore, used the mixed-methods approach, which provided triangulation, as both quantitative and qualitative approaches compensate for the weaknesses of each other. According to Pardede (2019), triangulation is the most common mixed-method design. In this study, the qualitative data was first collected and analyzed. At this stage, the purposive sampling technique was employed. Participants were interviewed on a one-on-one basis. Themes from the qualitative study were then used to drive the development of a quantitative instrument for further studies. As a result, there was an integration phase that connected the two strands of data for further analysis and interpretation of results.

1.9 Delimitation

The study excluded papers that are not directly relevant to either the user or organizational perspectives of e-consultation. The study considered the use of theoretical/conceptual papers, case studies, papers based on interviews, and other literature reviews focusing on medical e-consultation. Moreover, papers for review were extracted from reputable international online databases such as Scopus, Science Direct, Web of Science, IEEE Xplore, and so on. The study did not consider case studies that are more than five years old. Also, respondents for the survey and interview were those who were 18 years and above and who understood English. Patients who were critically ill or not in a position to communicate well were excluded from the study.

1.10 Organisation of Study

This research report is organized into five distinct chapters. The first chapter comprises the background of the study, statement of the problem, objective of the study, research questions,

significance of the study, scope of the study/limitations of the study, and organization of the study.

Chapter two presents a thorough review of several empirical and theoretical studies that discuss the adoption and usage of e-consultation. The chapter reviews diverse approaches to e-consultation implementation in both developing and developed countries. It also explores the literature on the factors influencing patient attitudes towards e-consultation and the changing role of trust in healthcare. The advantages and disadvantages of e-consultation are discussed, as well as the doctor-patient relationship in light of e-consultation implementation. The chapter further considers the literature on the use of e-consultation systems in healthcare and the potential benefits that may be realized from using those systems.

Chapter three presents information about this research's philosophical stance, pragmatism, and justification for the adoption of this philosophy. The chapter further reports in detail on the techniques that were employed for the qualitative and quantitative data collection. The sections include discussion on how the instrument was designed and managed during the interviews for the qualitative data collection and the survey for quantitative data collection.

Chapter four discusses the demography of respondents, qualitative data analysis of clinicians and patients, and quantitative data analysis of clinicians and patients. This understanding, which advances the researcher's knowledge of interpretation, provided answers to the fundamental questions of the entire research study. The chapter ultimately presents a model for the successful implementation of e-consultation in the Ghanaian Health Sector.

Chapter five summarizes the research, presents the major findings, and discusses the implications of the study. The researcher's contribution to the area of e-consultation is also

highlighted. The chapter presents the conclusion of the study, the limitations, and suggests possible opportunities for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter provides a detailed review of the existing literature on the research topic and the research context. The chapter begins by discussing e-health concepts and proceeds to examine e-consultation, an offshoot of e-health and the focal area of this study. Subsequent sections involve a thorough review of numerous empirical and theoretical studies that address the adoption and usage of e-consultation. The researcher reviews various approaches to e-consultation implementation in both developing and developed countries. The chapter also explores the literature on factors influencing patient attitudes towards e-consultation and the evolving role of trust in healthcare. The advantages and disadvantages of e-consultation are discussed, as well as the doctor-patient relationship in light of e-consultation implementation. This chapter further considers the literature on the utilization of e-consultation systems in healthcare and the potential benefits that may be realized from using such systems. Finally, the conceptual framework deemed most suitable for the study is discussed.

2.2 Definitions of E-health

The World Health Organization (WHO) states that e-health is a method of communicating information in health-related fields such as health services, learning, research, and security through digital connectivity (Jung, Son, & Choi, 2022). E-health is also described as a broad term encompassing various activities related to the use of multiple technologies, particularly the internet, for facilitating healthcare practices (Wickramasinghe & Tatnall, 2018). According to Khan, Xitong & Shahzad (2019), e-health involves leveraging ICT to connect companies, individuals, and governments; to inform and educate healthcare professionals, managers, and consumers; and to stimulate innovation in healthcare delivery, health system management, and

overall healthcare system improvement. Alternatively, André (2018) offers a more focused definition of e-health as "a concerted effort undertaken by leaders in healthcare and high-tech industries to fully harness the advantages available through the merging of the internet and healthcare." The advent of e-health appears well-suited to address both opportunities and challenges in the healthcare sector.

According to Naisbitt (1982), the new source of power is not money in the hands of a few but information in the hands of many. Information technology has significantly impacted healthcare delivery, where clients require new systems such as web health portals, online consultations, online scheduling, online management processes, and virtual clinics. Many individuals and organizations promote e-health as a strategy for improving the lives of rural populations. While adopting e-health offers numerous advantages to a country, several challenges, including the lack of funding, absence of healthcare policies and procedures, limited internet security, privacy, and bandwidth issues, must be considered before embracing such systems (Kesse-Tachi, Asmah, & Agbozo, 2019).

While there is widespread recognition of the need for Health Information Technology (IT) to address many healthcare challenges, coordinated leadership actions and common agreements among stakeholders on the necessary steps to improve healthcare quality, safety, and efficiency through IT are also essential (Neiman, 2017). The Health Policy and Systems Research and Analysis (HPSR&A) of Ghana discussed a framework for Health Technology Policies with specific emphasis on Health Technology Assessment (HTA) in Ghana. The team has made progress in formalizing HTA for decision-making in the Ghanaian health system (Hollingworth, Fenny, Yu, Ruiz, & Chalkidou, 2021). The health policy promotes the use of

technology in healthcare management, demonstrating the country's willingness to improve health information systems for more efficient delivery of health services.

The successful introduction of e-healthcare requires assessing the facilities and the political, infrastructural, and business factors, including the readiness factor (Kiberu, Mars, & Scott, 2019). Emuoyibofarhe & Oladosu (2019) define the readiness factor as the extent to which a community is prepared to participate and succeed in e-health adoption. Assessing readiness for innovation in healthcare can reduce the risk of failure after implementation. Therefore, it is crucial for e-health stakeholders to understand the readiness concept and determine the readiness status of rural communities before implementing any costly e-health innovations (ibid).

2.3 Role of E-health in Developing Countries

A subset of E-health is telemedicine, which specifically refers to the use of telecommunications technology to provide remote clinical services. It involves real-time consultations, diagnosis, and treatment delivered over secure and reliable communication channels (da Fonseca, Kovaleski, Picinin, Pedroso, & Rubbo, 2021). A telemedicine pilot project was introduced in Makassar City, Indonesia, to investigate clinicians' perceptions, including both satisfaction and barriers to using telemedicine. Despite the challenges encountered during the project, the study found that 47% of respondents complained about poor internet connectivity as a significant obstacle in utilizing the system. Nonetheless, it was considered practically viable because 78% of clinicians were satisfied with the consultation system (Indria, Alajlani, & & Fraser, 2020).

In Ghana, telemedicine is seen as an opportunity to bridge the distance gap for individuals who live in remote areas with limited access to healthcare and a lack of medical expertise. Some

patients need to travel long distances to major cities for medical assistance, many of whom cannot afford this (Jiang, et al., 2021).

2.4 E-consultation outlook

Technology-supported consultation in healthcare is considered a partial solution to a medical facility's challenge of providing healthcare to a diverse population, particularly rural communities (Chidhau, Mutizwa, & Muzama, 2021). Telemedicine technologies can add a different dimension to patient care by offering a logical extension of existing face-to-face physical doctor-patient consultations (Jacob, 2020). As one essential telemedicine method, e-consultation is widely referred to by some as a telemedicine solution that enables patients to receive treatment in their everyday living environments (Abid H. , Mohd, Ravi, & Rajiv, 2021). Some define e-consultation specifically as creating a digital internet doctor-patient consultation setting comparable to a physical examination, which may involve video-conferencing (telemedicine) technologies. Others view e-consultation as a concept for specialists. Abbott et al. (2018) contextualize it as communication among doctors; the remote interaction between a referring physician in one hospital and a specialist in another hospital on medical cases requiring specialized treatment (Abbott, Macke, Kurtz, Safdar, & Greenberg, 2018).

Few efforts have focused on enhancing the communication between medical professionals and patients (Wasserman, et al., 2019). The contribution of e-consultation to healthcare has been primarily examined using experimental methods (particularly randomized controlled trials). While the experimental approach has its place in studying the usability of e-consultation, in-depth robust qualitative studies are needed to reveal not only before-after outcomes but also how users communicate when using e-consultation (Almathami, Win, & Vlahu-Gjorgievska, 2020).

2.4.1 Defining E-consultation

E-consultation is defined as the capacity of the telemedicine system (technology and users) to enable consulting providers to understand and evaluate the health conditions of remote patients (Alharbi, Alzuwaed, & Qasem, 2021; Li, et al., 2021). In other words, e-consultation is the technological means which allows clinical evaluations of patients remotely.

Social Presence theory argues that media differ in the ability to convey the psychological perception that other people are physically present, due to the different ability of media to transmit visual and verbal cues (e.g., physical distance, gaze, postures, facial expressions, voice intonation, and so on) (Short, Williams, & Christie, 1976). Jonell, (2019) suggests that people are inclined to in-person interaction, and deviating from this requires an increased cognitive effort. Some researchers are worried that using interactive video clips for communication tasks raises the individuals' cognitive work by providing obstacles in conversation pacing as well as enhanced self-awareness, turn-taking, and asymmetric personal distance (Coombes & Gregory, 2019).

Nonetheless, some studies have revealed no differences between face-to-face and interactive video media in successfully completing social tasks (Mirzaei & Kashian, 2020; Völter, 2021). A systematic evaluation of doctor-patient interaction via e-consultation reveals more favorable outcomes than adverse ones regarding understanding e-consultation communications; the only exceptions were nonverbal actions and an absence of touch (Rosen, et al., 2022) . The doctor-patient communication research in the telemedicine literature has emphasized the importance of the doctor-patient relationship in enabling information giving and seeking between physicians and patients and has shown that richer media are better suited to facilitate this information exchange (Yuxin, Pingping, Zhaohua, & Ruoxi, 2020) .

2.4.2 Clinical View

E-consultation has both favourable and unfavourable effects on the healthcare ecosystem. Some clinicians believe that using e-consultation can be helpful during consultations since the information the patient has gathered from the internet concerning their health problem can contribute to better communication during the consultation. However, some clinicians are concerned about how patients will access and interpret the information they find. Another reported negative aspect of e-consultation from the clinicians' perspective is that when the patient gathers information about health issues from health websites, they may be more informed about their health issue before meeting a physician. This may cause issues with the relationship between the physician and the patient. The clinician also thinks that the complex medical terms found on the websites might lead to self-harm from self-diagnosis (Ravi, 2021).

Clinicians' use of e-consultation may vary according to gender, area of practice, and their distinct strategies for handling patients. Many clinicians use the internet for medical information retrieval, which also enhances their clinical knowledge. By using the internet, the clinician can also access up-to-date information from patient records (Sutton, 2020). Since clinicians are more accustomed to handwriting than using keyboards, they tend to have a conservative attitude toward e-consultation. Additionally, clinicians may be hesitant to use electronic media because it is challenging to evoke memories, express emotions, and make face-to-face contact with patients, and sometimes some diagnoses may be difficult to perform virtually (Jnr, 2020). Some clinicians do not agree with health systems because they believe that obtaining information from various computer applications is not a clinical skill. Others also think that introducing e-prescriptions can have errors when transcribing, and these errors may be difficult to correct (Zheng, et al., 2021).

2.4.3. Technological view

Access to health information through the internet has several advantages. On the internet, individuals can educate themselves about the dangers, benefits, and various therapies available for their health issues (Benedicta, Caldwell, & Scott, 2020). Information and communication technologies (ICT) can assist both patients and physicians in accessing reliable medical information, establishing a strong patient-clinician relationship, and improving communication, as well as providing a way to store, organize, and retrieve medical information. Access to health and wellness information on the internet can help individuals with self-care and prevent the use of incorrect medication. Additionally, people can explore different healthcare options to seek appropriate medical attention. E-consultations are highly feasible for patients who have access to the internet and various electronic devices. This will be particularly helpful for the aging population with increasing healthcare needs to obtain necessary medical information from the comfort of their homes (Hendy, Lai, & de Lusignan, 2019). However, using the internet for care-seeking can also have adverse effects. If the network is unstable or has high latency, the information provided by the physician or patient can be misleading or misunderstood by both parties, which could lead to an incorrect diagnosis or treatment (Dash & Sahoo, 2021).

2.4.4 Societal view

One of the reasons why many individuals seek health information on the internet is due to the lack of communication between patients and clinicians. Additionally, some people prefer e-consultations as they may not receive adequate attention when they visit healthcare facilities. A shortage of healthcare professionals and time constraints on consultation time have caused individuals to seek online consultations (Wosik, et al., 2020).

The presence of health information on hospital websites, relevant medical care websites, and cost-effectiveness of accessing these online resources have made people more knowledgeable about online usage. People also feel more secure when using the internet for information because they can be better informed about their specific health issues, the medications they can use, and access information regarding nutrition and disease prevention (Zimmerman & Shaw Jr, 2020). However, this can also make physicians feel insecure as patients can discover information about their health problems and expected treatment, or patients may become confused about their health issue (Liu & Jiang, 2021). Nowadays, people are accustomed to internet chats and the use of various social media apps to connect with others, making it easier for patients to connect with doctors through electronic means, making e-consultations the new normal.

2.4.5 Security
Safety is a significant concern when it comes to e-consultations. One of the most common safety issues is accountability, access, and authentication. There are also additional difficulties related to e-consultation security that have been raised recently, including the protection of personal information. This is crucial for building trust between the patient and the physician (Qi, Cui, Li, & Han, 2021).

Establishing reliable policies and standards for e-consultation will help provide dependable and high-quality medical care to the general public. It will also contribute to building confidence among end-users and medical professionals regarding the reliability and security of health services rendered (Zhao, Zhang, Dasgupta, & Xia, 2022; Aichholzer, 2020). However, as of now, Ghana does not have policies and standards for e-consultations for healthcare facilities.

Although the privacy of the patient's documents is considered in most e-consultation applications, the manual patient records are considered legal documents that may only be accessed by authorized individuals.

2.4.6 Advantages of E-consultation

Compared to in-person consultations, e-consultation platforms may offer patients timelier and more convenient information by displaying various signals that could assist in patients' physician selection for online consultations (Shah, Naqvi, & Jeong, 2021). These signals include the physician's online track record and offline reputation. Shah, Yan, Shah, Shah, & Mamirkulova (2019) found that online credibility in the form of patient-generated signals or perceptions of an online physician positively impacts patients' online decision-making.

a) Relieve excessive waiting periods

Capitalizing on the enhanced benefits triggered by the spillover effect of digitalization, e-consultations have significantly alleviated patients' burdens of physical registration, excessive waiting periods, and long queues in hospitals.

b) **Increased patient involvement in medical decision**

Through various online channels, such as the internet, smartphones, apps, and other software, patients lacking professional medical knowledge can gather as much information as possible, reducing their knowledge deficit in the knowledge market. Medical clients can educate themselves with the influx of digitalized information. The unbalanced distribution of medicine-related facts between clinical experts and ordinary individuals has shifted in favor of the latter (Wang, Sun, Liu, & Lai, 2021). Based on the information-related "self-enlightenment" of the medical public and laypeople, some studies have also noted changes in social relationships and the power structure between patients and physicians (Wang, Sun, Liu, & Lai, 2021). Through

additional gains in information by non-professionals, the monopoly of expertise by medical staff and professional groups and their absolute authority has been partially disrupted, potentially leading to more equitable communication between physicians and their patients.

Traditional hierarchical interaction patterns between patients and physicians have been adjusted in many cases through mutual consultation on treatment and recovery plans, suggesting a new model of shared decision-making involving both parties. Increased involvement of patients in co-decision processes concerning medical treatment means more sharing of burdens and responsibilities (Wang, Liu, Lam, & Gao, 2021). Digitalising medicine creates new opportunities for health-related democracy and mass emancipation (Wang, Sun, Liu, & Lai, 2021). Through the 'empowerment' of ordinary people and patients, medicine-related knowledge stratification is further flattened (Topol, 2019).

c) Easy Accessibility to Healthcare

By utilizing telemedicine websites or applications to obtain clinical services, individuals can simply stay at home and gain direct access to health experts through their smartphones or personal computers, transmit their health records collected by wearable devices, and then receive the corresponding medical services they need. Consequently, patients have less face-to-face interaction with medical staff (Tates, Antheunis, Kanters, Nieboer, & Gerritse, 2017). Mold, Hendy, Lai, & de Lusignan, (2019) also indicated that although patients can accept e-consultations, they have concerns regarding this service delivery mode in terms of communication with the service provider.

d) Efficiency.

One of the potentials of e-consultation is to increase efficiency in healthcare and, consequently, reduce costs. One possible way of lowering costs is to avoid duplication or unnecessary

diagnostic or therapeutic interventions. This can be achieved through improved communication between healthcare establishments and patient involvement (Robblee, 2020). The internet typically serves as an enabler for achieving this objective in e-consultation.

e) **Quality of healthcare**
Improving efficiency involves cost reduction and should be considered in conjunction with enhancing quality, which is among the primary objectives of e-health. A more informed patient, as a result of educational enlightenment on e-health, can interact better with their doctor. Consequently, this leads to a better understanding and utilization of e-consultation services, resulting in improved healthcare quality (Kose & Oymak, 2019).

f) **Empowerment of patients**
As noted by Burton et al. (2022), making the knowledge bases of medicine and personal e-records available to consumers and patients online using their individualized verification identification opens up new avenues for patient-centered medicine. This enables patient education and thus increases the likelihood of informed and more satisfied patients (Kose & Oymak, 2019).

g) **Saving Time and Cost**
E-consultation saves time and cost for patients. Mustufa et al. (2022) reported that in a 30-day study, e-consultation significantly reduced the duration of the consultation. A total of 197 patients were approached; 165 (83%) consented and were randomized—76 (45%) to face-to-face (F2F) and 89 (54%) to telemedicine (TM) cohorts. There were no significant differences in baseline demographics between the cohorts. Both cohorts were equally satisfied with their postoperative visit (F2F 98.6% vs TM 94.1%, p=0.28) and found their visit to be an acceptable form of healthcare (F2F 100% vs TM 92.7%, p=0.06). The TM cohort saved a significant

amount of time (TM 66.2% spent <15 minutes vs F2F 43.1% spent 1–2 hours, p <0.0001) and money (44.1% TM saved $5–$25 vs 43.1% F2F spent $5–$25, p=0.041) associated with travel (Mustufa et al., 2022). There were no significant differences in 30-day safety outcomes between the cohorts. The study demonstrates that e-consultation saves patients time and money without compromising satisfaction or safety.

2.4.7 Disadvantages of E-consultation

a) Low level of Trust
E-consultation is considered as an alternative considered to be so vital that it can possibly substitute face-to-face consultation in the future (Li, et al., 2021). The need for in-person communication and not relying solely on e-consultation quality is cited by numerous individuals as a factor for not using e-consultation, despite the time and money spent on travel for consultations (Almathami, Win, & Vlahu-Gjorgievska, 2020; Zanaboni & Fagerlund, 2020). Neha, Richard, Erica, & Sylvia (2021) studied the development of trust in the relationship between face-to-face and online patient-provider communication. The outcome showed that patient trust and patient satisfaction both positively moderated the relationship between face-to-face and online patient-provider communication. The results of this study emphasized the crucial roles of patient-centered communication and the patient-provider relationship in the process of eHealth and e-consultation.

Lu et al. (2022) conducted a study on patients' self-disclosure and positive influences on the establishment of patients' trust in physicians. "Good Doctor," a China-based online health community, was used as a data source, and a computer program was developed to download data for patient-physician communication in this community. The results showed that patients' self-disclosure positively influences their establishment of trust in physicians. Furthermore,

physicians' provision of social support to patients demonstrated a complete mediating effect on the relationship between patients' self-disclosure and patients' establishment of trust in physicians (Liu, et al., 2022). In addition to the trust issue of patients in e-consultation, the literature also identified concerns regarding care quality in remote consultation environments, including telephone, email, video, and the internet. However, these negative aspects of e-consultation were typically mentioned briefly but not further elucidated. While positive outcomes of e-consultation are relatively well-established, the lack of studies on the negative effects of e-consultation prevents people from fully understanding the concept and accepting the technology (Dash & Sahoo, 2021; Almathami, Win, & Vlahu-Gjorgievska, 2020)

b) **Miscommunication, misdiagnosis and lack of face-to-face contact**

All the risks entailed in technological systems, and the changing communication opportunities on the internet must also be taken into account. Physicians require clinical education in cyberspace; additionally, it would be beneficial to develop and implement standards for medicine in electronic communication (Shah, Naqvi, & Jeong, 2021). Atherton et al. (2018) further describe the evolving doctor-patient relationship through e-consultation, as patients and doctors often cannot have face-to-face contact, which has been a significant concern of e-consultation. Consequently, there is a risk of misinterpreting the information acquired through online health portals, and the doctor may misdiagnose the actual ailment due to the patient's inability to describe it accurately (Prescott, Rathbone, & Brown, 2020). Personal contact typically allows for further explanations, follow-up questions, and dialogue between doctor and patient when clarifications are needed. Thus, the absence of physical presence makes it challenging to form an opinion about the individual providing the information and the ability to demonstrate where the pain is located. Additionally, the inability to establish communication with one's doctor has been cited as a drawback.

2.5 Adoption of telemedicine

E-consultation is located within a basic network of provider acceptance of telemedicine. While e-consultation is the focus of this dissertation, it is important to understand the telemedicine context within which this construct is developed and situated. Some form of telemedicine services are provided by medical care companies all over the world (Kamal, Shafiq, & Kakria, 2020). Many countries have adopted this innovation to enhance their healthcare services. The success of telemedicine relies on how hospitals adopt a system to overcome the obstacles related to the design and use of technology in healthcare facilities (Scott Kruse, et al., 2018; Napitupulu, Yacub, & Putra, 2021). Although many telemedicine applications have been adopted in some communities, they have not been implemented countrywide. The factors for adopting telemedicine have primarily been evaluated using qualitative research. Some qualitative models used include the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and the Theory of Interpersonal Behavior (TIB).

2.6 Hospital Information Systems (HIS)

A Hospital Information System is designed to handle all the administrative tasks connected to a healthcare facility. This consists of handling client demographics, Electronic Health Records, drug administration, laboratory details, and financial resources (Khubone, Tlou, & Mashamba-Thompson, 2020). This approach of sending information using an electronic data processing system can assist specialists to make rapid and effective decisions. Through this system, hospitals will be able to manage the administrative, clinical and financial areas in a very efficient manner (Islam, 2018).

India has introduced a Hospital Information System that enables the distribution of data, knowledge, process, effective monitoring and mentoring by professionals from high-end medical services to all the lower levels of medical services. This system will be useful to all

levels of health centres in the nation as soon as medical facilities are computerised (Walsham, 2020).

2.7 Phone and Internet Usage in Ghana

As of January 2021, Ghana's population was 31.40 million, of which 57% was urban and 43% was rural. The two biggest cities, Accra and Kumasi, have populations of over 1 million (Accra, the biggest, has a population of 1,963,264; Kumasi follows closely with 1,468,609). Tamale is the third biggest city but much behind Accra and Kumasi with a population of over 350,000 (Mjwana, 2021). Ghana's internet accessibility and mobile phone penetration are stratified, with 50% (15.7 million) of the population linked to the net, the majority of whom remain in metropolitan locations. Total mobile infiltration is 90% (41.6 million), and digital health interventions have been implemented through mobile health, including SMS and toll-free calls (Kemp, 2021). Accessibility to the internet using mobile phones has raised from 2% of the populace in 2005, to 45% today; hence, a lot more individuals can access the net on their smartphones than from a computer (Omondi, 2020). Extra granular information would aid in understanding whether all smart devices have accessibility to the internet. Ghana was apparently among the initial nations in Africa to introduce a cellular mobile solution and connect to the internet (Sci, 2021). In 2021, Twitter announced it would establish its regional African headquarters in Ghana, thanks to the country's commitments to free speech and open access (Business Insider, 2021).

2.8 Overview of Ghana Health System

On the whole, Ghana's health system has made significant progress towards expanding physical infrastructure and bringing healthcare closer to communities (Escribano-Ferrer, Cluzeau, Cutler, Akufo, & Chalkidou, 2016). Every year, over 86,000 Ghanaians are approximated to pass away from lifestyle diseases with over 50% of these being under the age

of 70 (Amponsah, 2017). Notwithstanding, 12,000 kidney-failure cases are diagnosed among Ghanaians every year (Andoh, Adekoya, Weyori, & Tannor, 2021) A strong medical care system with reasonably bad facilities and a decrease in international funding are obstacles to enhancing Ghana's health conditions. Most of the patients have accessibility to clinics as well as basic health care, while accessibility to tertiary and secondary health services is extremely minimal. The high rate of communicable diseases, growing incidence of chronic diseases and recurrent epidemics remain the highest concern. The health services in Ghana include government health services, private, traditional and nongovernmental providers, civil society, and community groups. It also includes collaboration and partnership with other ministries, departments, and agencies whose policies and services have a major impact on health outcomes. Theoretically, Ghana has a decentralized, multi-level health and wellness system. The major regulative body that a lot of institutions would deal with in developing a health care solution or clinic is the Ministry of Health (MOH); they have the responsibility for health policy formation, regulation and strategic direction. A diagrammatic view of the Ministry of Health is seen in figure 1.
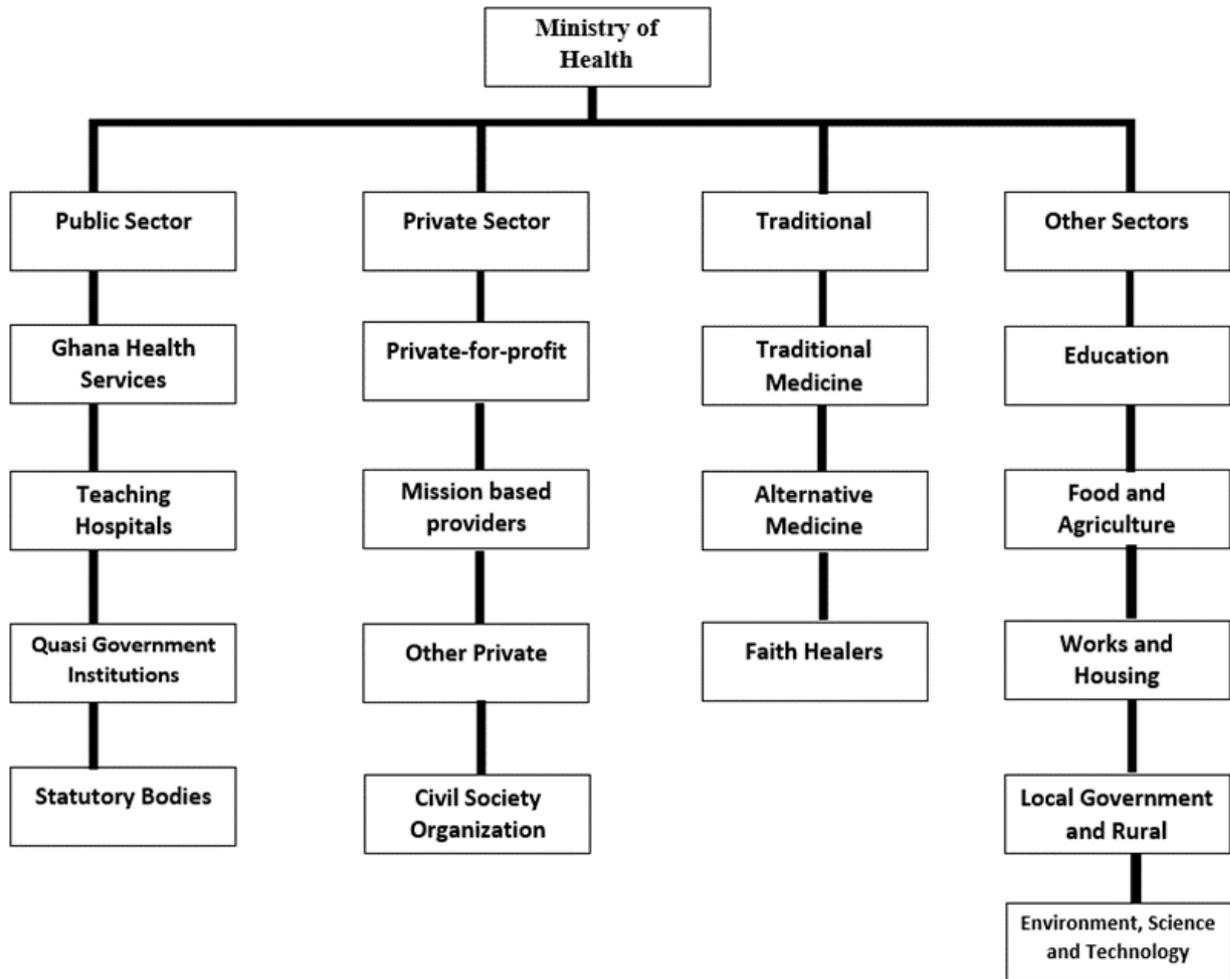
Figure 1 : Relationship of the Ministry of Health to the Various Sectors and Organisations in Ghana

Ghana's public health sector consists of the Ghana Health Service (GHS), teaching hospitals, quasigovernmental institutions, and sector-focused statutory bodies. The GHS oversees numerous regional and district health administrations, hospitals, and community health planning and services (CHPS) compounds. The traditional healthcare system in Ghana focuses on improving access to basic healthcare and delivering higher quality care at affordable costs.

Table 1: Health Facilities by Type

Health Facilities by Type	Quantity
Community-based Health Planning and Services (CHPS)	5421
Clinics	998
District Hospitals	140
Health Centers	1004
Hospitals	357
Maternity Homes	346
Mine Health Facilities	11
Polyclinics	38
Psychiatric Hospitals	3

Source: Health Sector in Ghana Review (Itrade, 2020)

In Ghana's traditional healthcare system, the primary focus is improving access to basic health care and delivering higher quality care at affordable costs. Integrating mobile technology in current health care strategies provides new cost-effective opportunities to deliver quality healthcare and ensure better interaction between professionals and patients (Itrade, 2020). The purposes of including electronic health in Ghana's health care sector consist of optimizing assets utilization and efficiency, improving patient experience, remote diagnosis, remote monitoring and prevention, access to health-related information, effective service delivery, and maximizing time and services of health care professionals. Mobile network coverage and connection are extremely high in Ghana which is quickly advancing evolving simple communication tools and mobile technologies into service delivery platforms, including healthcare. Since consumers are the key and most powerful stakeholders to adopting a mobile

health ecosystem, reaching them comfortably via cellphones and the internet produces a prepared market for Digital health.

2.9 Usage of Computing and internet among Health Workers

Research by Shiferaw and Mehari (2019) reveals that 47.4% of health employees utilized the internet for normal medical/professional updates, which is significantly lower compared to healthcare professionals in developed countries such as the UK, where it is 97%. A possible reason for this could be inadequate computers and slow internet connections at health facilities. Over half of the participants in this study agreed to take certified online courses, which is comparable to online studies among health professionals in other countries. The impact of internet usage on clinical decisions was also notably significant and confirmed by several studies (Sutton, et al., 2020; Kwan, et al., 2020). As a matter of fact, from Daraz et al., (2019), the quality of healthcare information is less trusted. Just 2.4% of health specialists suggested a site for their people. On the other hand, patients never asked medical staff for a website referral to obtain more information on their condition, which may be due to infrastructural and socioeconomic constraints in underdeveloped countries. In Ghana, younger health workers expressed confidence in their ability to quickly learn and use computers despite having limited prior exposure. Some older providers are pessimistic about being able to quickly learn and use computers. A study conducted in rural Ghana shows that healthcare workers' computer skills and knowledge are relatively low (Ofori, Akowuah, Babatunde, Cowan, & Baiden, 2021).

2.10 Theoretical Framework

2.10.1 Deleone & McLean updated IS success Model

The updated DeLone & McLean IS Success Model consists of six interrelated dimensions of IS success: information, system, and service quality; (intention to) use; user satisfaction; and net benefits. The arrows demonstrate proposed associations between the success dimensions.

The model can be interpreted as follows: a system can be evaluated in terms of information, system, and service quality; these characteristics affect the subsequent use or intention to use and user satisfaction. As a result of using the system, certain benefits will be achieved. The net benefits will (positively or negatively) influence user satisfaction and the further use of the information system.
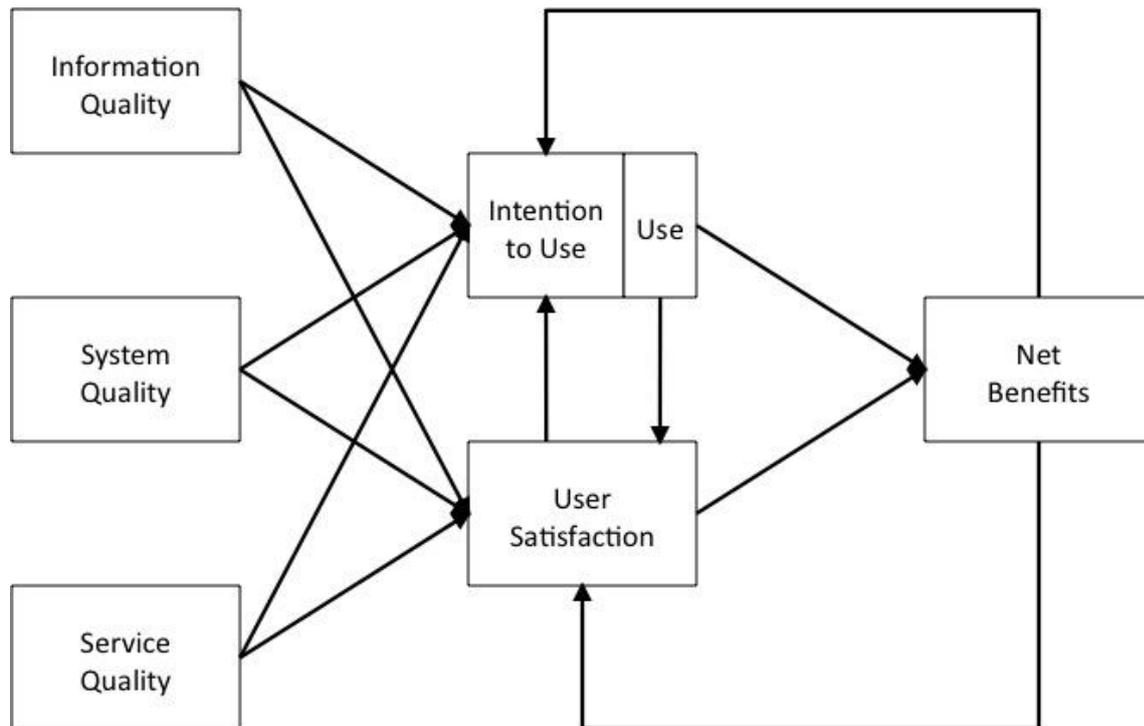
Figure 2: Updated Information Systems Success Model Source: (DeLone & McLean 2002, 2003)

This updated IS success model accounts for benefits at multiple levels of analysis. This revision allowed the model to be applied to whatever level of analysis the researcher considers most relevant. A final enhancement made to the updated D&M model was a further clarification of the use construct. The authors explained the construct as follows: 'Use must precede "user satisfaction" in a process sense, but a positive experience with "use" will lead to greater "user

satisfaction" in a causal sense' (DeLone & McLean, 2003). They went on to state that increased user satisfaction will lead to a higher intention to use, which will subsequently affect use.

Ruth, Angelina, Hermawan, & Suroso (2019) used the DeLone and McLean Model of Information System (IS) success model to survey 110 users. The study found that there was a significant effect between system quality on user satisfaction, service quality on use, service quality on user satisfaction, and user satisfaction on net benefits. Meanwhile, system quality had an insignificant effect on use. These empirical results provided evidence of the instrument's reliability, validity, and general applicability.

Minsun and Heui (2020) conducted a study to validate the DeLone and McLean information system success model in the context of online health information sites. The study found indirect paths from information quality to perceived benefits, one mediated through intention and the other mediated through satisfaction and then intention. Service quality had a significant association with user satisfaction, and its impact on perceived benefits occurred indirectly through user satisfaction and intention in serial (Minsun & Heui, 2020). It is, therefore, imperative that hospital information systems are designed in ways that are easy to use, flexible, and functional to serve their purpose.

The D&M model has been applied and validated in a number of IS studies. For instance, it has been tested and validated in studies assessing the success of e-commerce systems (Goundar, Buksh, Masilamani, Rajan, & Prakash, 2021), knowledge management systems, e-government systems, and more (Purwati, Mustafa, & Deli, 2021; Çelik & Ayaz, 2022).

Since its inception, DeLone–McLean model has been tested and validated through various approaches. Some studies have demonstrated strong validity of the construct, while others have

revealed only partial validity (Aldholay, Isaac, Abdullah, & Ramayah, 2018). In light of these findings, the researcher opted to adopt the theory of diffusion and innovation to complement the D&M model (Alzahrani, Imran, & Naser, 2019).

2.10.1.1 The Relationship between Perception and Intention to Use

Organizations can influence factors that affect customers' intentions to adopt new technology, thereby shaping customer behavior. Measuring behavioral use and end-user satisfaction is also a method for assessing the acceptance of new technology (Zaitul, 2021; Sabbir, Taufique, & Nomi, 2021). Customer satisfaction is closely related to service quality, as satisfaction (or dissatisfaction) is driven by consumption and arises from experiencing a service quality encounter and comparing that encounter with expectations (Cetin, 2020). In other words, satisfaction is a subjective sensation and feeling elicited by the perceived discrepancy between expectations and service quality. Compared to usage, which can be directly observed, satisfaction is relatively difficult to measure; however, it is not uncommon to see models developed based on satisfaction by identifying influential factors.

Julie, Martí, & Merce, (2022) conducted a study to develop a theoretical service quality (SQ) model for direct-to-consumer (DTC) telemedicine consultations. The conceptual model captured three primary dimensions (system quality, interaction quality, and use quality) that represent the SQ of DTC telemedicine consultations from a patient perspective. Therefore, it is essential to develop an appropriate measurement tool to collect and analyze patients' perceptions and encourage faster adoption of the technology.

2.10.2 Diffusion of Innovation

Diffusion of innovations is a theory proposed by Everett Rogers that seeks to explain how, why, and at what rate new ideas and technology spread. Rogers contends that diffusion is the

process by which an innovation is communicated over time among the participants in a social system (Rogers, Singhal, & Quinlan, 2019).

Diffusion of innovations theory is highly suitable for investigating technology adoption. In fact, much diffusion research involves technological innovations, so Rogers (2003) often used the terms "technology" and "innovation" interchangeably.
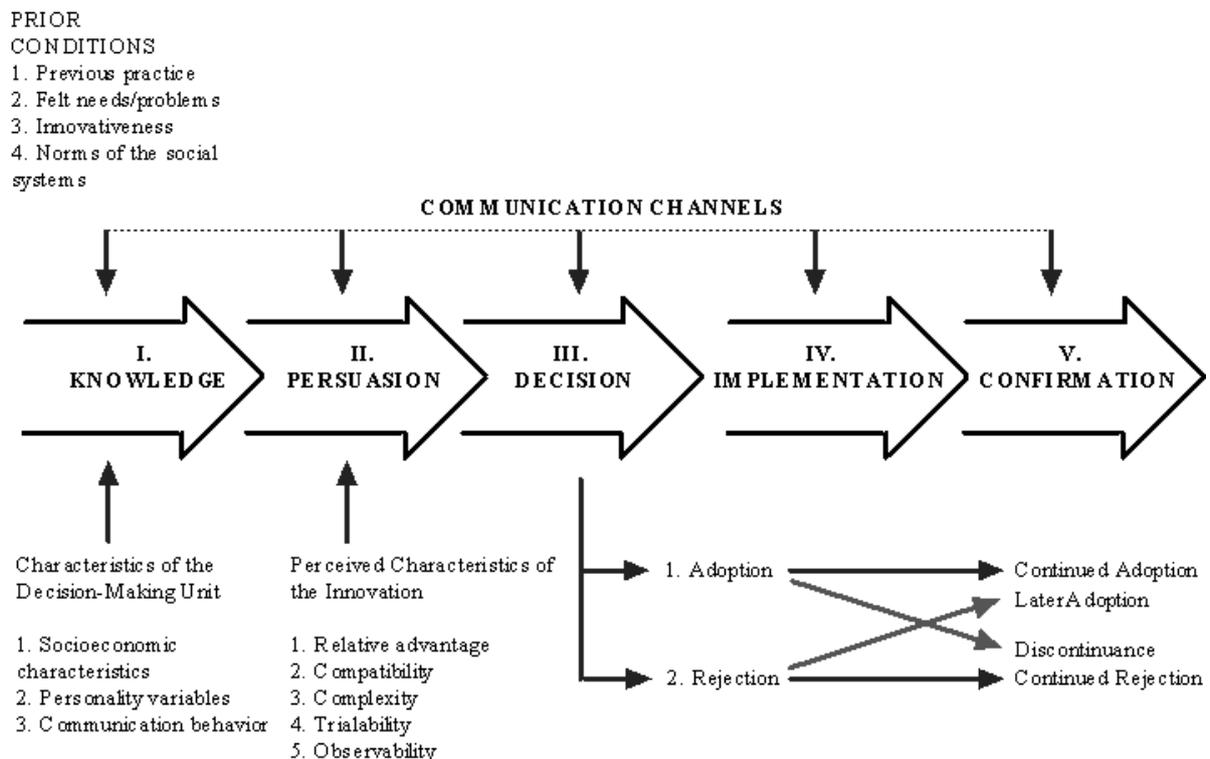
Figure 3: Diffusion of Innovation   Source: Rogers (2003)

The five stages of this model are:

a) **Knowledge** – The individual (or decision-making unit) is exposed to the innovation's existence and gains some understanding of how it functions.

b) **Persuasion** – The individual (or unit) forms a favourable or unfavourable attitude toward the innovation. This may involve, for example, a matching of the innovation to a perceived problem, and some kind of appraisal of the costs and benefits of adoption.

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c) **Decision** – The individual (or unit) engages in activities that lead to a choice to adopt or reject the innovation. This may include interaction with forces of support or opposition that influences the process.

d) **Implementation** – The individual (or unit) puts an innovation into use.

e) **Confirmation** – The individual (or unit) seeks reinforcement for an innovation decision already made but may reverse this decision if exposed to conflicting messages about the innovation.

This model, is widely considered to represent the standard model of technology transfer. However, some authors extend the model to include considerations of the routinization of the innovation (so that its adoption no longer seems innovative) and issues of infusion (when the innovation is applied to its full potential) (Zhang S. &., 2019)

2.10.2 Diffusion of E-consultation in Ghana
E-consultation services were initiated in the Amansie-West area in 2010 (Opoku, Scott, & Quentin, 2015) linking communication between the district hospital and the local teleconsultation clinic. The service was established to assess healthcare professionals' perceptions of the benefits and challenges of serving this area and to identify possible areas of improvement (ibid). The test received favorable feedback from clinical personnel and was considered a significant improvement in the quality of care, which subsequently reduced the need to refer patients to the district hospital. Some issues arose, such as phone service delays, stressful workloads on telecommunication staff, and inadequate information received from phone calls, but steps have been taken to rectify these problems. Despite these challenges, teleconsultation services had the potential to significantly enhance the quality of care for those who needed it most. However,

technological issues hindered the potential effectiveness of teleconsultation. E-consultation could be the future of medicine in Africa, provided that the necessary training and maintenance culture is adhered to.

In Ahanta West, Ghana, research was conducted using an SMS device called Measure SMS. This device was developed in collaboration with Tripod Software LTD to use SMS data transfer via basic mobile phones rather than an application due to its low cost (Stanton, Mkwanda, Debrah, Batsa, & Biritwum, 2015). The SMS tool was used in 34 of the 114 communities. Health workers were more likely to own a basic mobile phone than a smartphone.

Novartis (2016) found that over half of all pilot projects in teleconsultations were resolved directly by phone, with 31% avoiding referrals due to the challenge of accessing specialist care. Ghana, like many other countries, experienced a significant acceleration of e-consultation diffusion as a result of the COVID-19 pandemic outbreak (Weiquan, Li, Tao, & Tian, 2021). COVID-19 has highlighted persistent healthcare inequities in society, with people of color in underserved communities experiencing disproportionately high infection and death rates. Increasing access, efficiency, and quality of care for the population by empowering experts and frontline healthcare workers to be virtually accessible through E-consultation is a key to healthy development.

2.11 Empirical Studies

Van dijk, Mutengerere, Musengi, Kwaome, & Nyamande (2022) conducted studies concerning Diabetic Retinopathy (DR) screening through e-consultation at the Provincial Hospital level in Zimbabwe, using a digital device. Patient assessment included patient history, weight, height, waist, visual acuity, fundoscopy, and measurement of HbA1C, creatinine, and lipid levels. Digital fundoscopy images were reviewed remotely by an ophthalmologist through e-

consultation, providing feedback through standardized digital forms. Patients with normal fundus received yearly routine fundoscopy screening, while those with abnormalities were referred to a consulting ophthalmologist. Thus, based on the reviews by Van Dijk, Mutengerere, Musengi, Kwaome, & Nyamande (2022), despite the weaknesses in the research design and methodologies in the reviewed studies, e-consultation diagnostic accuracy and agreement may be largely dependent not only on medical specialties but also on specific medical conditions examined, and the type of telemedicine technology utilized (e.g., store-and-forward versus interactive video).

Yang, Xiaofei, Lee, & Peter, (2019) did a study by analyzing 77,248 patients' behaviours of an e-consultation platform covering the period 2014–2015, they found that the response time, the depth of interaction, and service content during the first consultation influence the patients' subsequent consultation behaviours significantly. Also, the effects of doctor response time, service content, and depth of interaction on patient satisfaction are different in different periods. Ajitabh & Anjan (2021) conducted a study on physicians' perceptions of e-consultation adoption amid the COVID-19 pandemic. They gathered data from 337 physicians from Delhi-National Capital Region who had experience with e-consultation. The researchers developed and tested several hypotheses using a structural equation model based on UTAUT2. The study's findings revealed a positive and significant relationship between a physician's intention to adopt e-consultation and facilitating conditions, effort expectancy, social influence, and performance expectancy.

Daniel et al. (2022) conducted a study on the universal electronic consultation (e-consultation) program of a cardiology service, analyzing 47,377 patients. Of these patients, 61.9% were attended through e-consultation, and 38.1% received one-time face-to-face consultations. The

waiting time for care was shorter in the e-consultation model (median [IQR]: 7 [5-13] days) than in the face-to-face model (median [IQR]: 33 [14-81] days), P < .001. The interrupted time series regression model demonstrated that the introduction of e-consultation substantially decreased waiting times, which stabilized at around 9 days, albeit with minor fluctuations. Patients evaluated via e-consultation experienced fewer hospital admissions (0.9% vs 1.2%, P = .0017) and lower mortality (2.5% vs 3.9%, P < .001). This study reveals that an outpatient care program incorporating e-consultation significantly reduced waiting times and proved safe, with a lower rate of hospital admissions and mortality in the first year.

Re-Aldana et al. (2022) conducted a study to assess the clinical impact of implementing an outpatient care model that included an initial e-consultation and compared it with a one-time face-to-face consultation mode. Using an interrupted time series regression model, they analyzed the impact of incorporating e-consultation into a health care model. They found that employing e-consultation in an outpatient care program significantly reduced waiting times and was safe, with a lower rate of hospital admissions and mortality in the first year (ibid). In another study, e-consultation was shown to reduce nephrology wait times and significantly increase referral completion rates. In large integrated health systems, e-consultation has considerable potential to improve access to specialty care, reduce unnecessary appointments, and optimize the patient population seen by specialists (Schettini, et al., 2019).

Paling, Lambert, and Clouting (2020) found that, in the emergency department, prolonged wait times are associated with increased morbidity and mortality and decreased patient satisfaction. Thus, e-consultation has tremendous potential for improving access to specialist advice in a much timelier manner than the traditional referral consultation process, as well as reducing patient waiting time for face-to-face consultation. Undoubtedly, a health facility that adopts e-

consultation would affect its OPD services. The findings of these studies could serve as a test case for examining the successful implementation of e-consultation. A ripple effect of e-consultation on OPD could imply that most people have adopted the technology and would only come for a face-to-face consultation when conditions necessitate it.

Mold, Hendy, Lai, and de Lusignan (2019) conducted a systematic review of the use and application of e-consultations in primary care. They found that patients reported satisfaction with services and improved self-care, communication, and engagement with clinicians. Evidence for the acceptability and ease of use was strong, especially for those with long-term conditions and patients located in remote regions. However, evidence suggests that e-consultations work well for some patient groups but not for others, impacting access, with the elderly and the poor being less likely to use these services. A potential limitation of this study is the dearth of studies reporting health outcomes from e-consultations. Thus, there is a need for further high-quality studies to fully evaluate the usefulness of e-consultations in primary care, especially in Ghana. Mold et al. (2021) suggest that there is a need to improve e-consultation implementation, demonstrate how e-consultations will not increase disparities in access, provide better reassurance to patients about privacy, and incorporate e-consultation as part of a manageable clinical workflow.

Qi, Cui, Li, & Han (2021) did a study to identify the factors influencing the public intention to use e-consultation and explore the effect path of the factors and behaviour intention. The researchers developed a research model based on the technology acceptance model and perceived risk theory. Also, structural equation modelling was used to analyze the data. The study found that perceived ease of use had a positive effect on behaviour intention but it was not statistically significant ($\beta=.117$, $P=.07$) and it had a positive effect on perceived usefulness

(β=.537, *P*<.001). Besides, personal innovativeness had an effect on behaviour intention. Getting most people to patronize e-consultation could enhance healthcare delivery. According to 2020 World Health Statistics, most patients develop common and chronic diseases. This means that if most people can have regular checkups by using e-consultation at their homes or in comfort, there would be early detection of common and chronic diseases which would be a great medical stride by reducing pressure on health facilities. Moreover, e-consultation could provide patients with more choices of doctors and break the constraints of time and space.

Notwithstanding, Møller, Fage-Butler, & Brøgger (2021) did a study on Complexity and Simplicity in Doctor–Patient e-consultations. The researchers explored whether e-consultations in Denmark reflect recommendations that they should be simple, short, concrete and well defined, and if not, what forms of complexity are evident. The researchers inductively analysed 1,671 e-consultations from 38 patients aged 21–91 years communicating with 28 doctors, 6 nurses, 1 medical student and 8 secretaries. The study found that despite existing guidelines and the leanness associated with the email medium, multiple forms of complexity were evident (ibid). This mismatch highlights the need for theoretical development as well as the value of re-examining existing policies and guidelines regarding expectations for e-consultation. It is obvious that some developed countries still have challenges with policies regarding e-consultation. Howbeit, e-consultation is still in its infancy in Sub-Saharan Africa with most African countries not having a guiding policy at all. It is therefore imperative for African countries, especially Ghana to develop a sustainable policy framework for e-consultation.

Marcos et al., (2020) did a study to find the results of an e-consultation service between Primary Care Providers (PCP) and a Respiratory Unit as the first consultation in a lung cancer staging

process. Since most patients have advanced and incurable disease at the time of diagnosis. The development of an e-consultation system provided an easier way to start the staging process. The researchers used a retrospective study of a secure, web-based e-consultation. After the electronic consultation, each patient with possible Lung Cancer received a phone call and had a scheduled face-to-face interview during the staging process. The study found that implementation of e-consultation service in the Lung Cancer staging process reduces wait times for patients and leads to overall cost savings. This study is in line with the findings of Re-Aldana et. al. (2022) which suggested that e-consultation reduced the waiting time of patients significantly. Marcos et al., (2020) further mentioned that added activities or meetings should be planned (outpatient health information) because of the high emotional demand of these patients. By implication, patients' emotions tend to influence their attitudes towards e-consultation. Hence by scheduling meetings to meet the emotional demands of patients their attitude towards e-consultation might be satisfactory in the right direction.

More so, Dash and Sahoo (2021) investigate physicians' perceptions of e-consultation adoption, which has the potential to bridge existing gaps in the current healthcare system, using the unified theory of acceptance and use of technology (UTAUT2) framework. The researchers used a judgmental sampling method to collect primary data from 337 physicians from Delhi-National Capital Region who had experience with e-consultation. A number of hypotheses were developed and tested using a structural equation model based on UTAUT2. The study's findings revealed an affirmative and significant relationship between a physician's intention to embrace e-consultation and facilitating conditions, effort expectancy, social influence and performance expectancy; however, habit and experience are not significantly linked to it (ibid). This study reveals the attitude of patients towards e-consultation. Naturally, people who can

adopt new technology have the psychological expectancy of deriving benefits from the use of the technology than using a traditional or ordinary approach. Therefore users of e-consultation would expect the technology to make their clinical life easy or mitigate the hustle of having a face-to-face consultation.

One exception is a study conducted by Alhajri, et al., (2021) which reveals that there was no significant difference in physicians' confidence toward managing long-term and follow-up consultations through video or audio consultations (OR 1.35, 95% CI 0.88-2.08; P=.17). Also, video consultations were less likely to be associated with a reduced overall consultation time (OR 0.69, 95% CI 0.51-0.93; P=.02) and reduced time for patient note-taking compared to face-to-face visits (OR 0.48, 95% CI 0.36-0.65; P<.001). However, this study used a 5-point Likert scale survey to measure physicians' attitudes and perceptions of video and audio consultations with reference to the quality of the clinical consultation and professional productivity.

In addition, Salisbury, Murphy, & Duncan (2020) did a study on the impact of digital-first consultations on workload in general practice. They found out that usage of e-consultation and video consultation in the United Kingdom is generally very low, so the impact is minimal. This was confirmed by Adams, Lim, & Huang, (2022) who researched the Practice of Psychiatric e-consultation. The study suggested that Primary care Physician (PCP) utilisation of e-consultation was low. E-consultation is not widely known or used as compared to the traditional mode of consultation. For example, in Norway one would expect that the use of e-consultation should be very high but the use of e-consultation was low compared with the use of electronic communication for administrative requests, such as repeat prescriptions and test results (Salisbury, Murphy, & Duncan, 2020).

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2.12 Interoperability Standards

Interoperability refers to the extent to which different information technology systems and software applications can exchange data, communicate, and interpret data. Effective interoperability can provide improved healthcare for individuals and communities through health information systems within and across organizational boundaries (Hasselgren, Kralevska, Gligoroski, Pedersen, & Faxvaag, 2020). Lack of interoperability is a major problem in the healthcare industry, especially in the area of electronic health records. To address the issue of a lack of interoperability in these areas, HL7 (Health Level 7) and some other standards like Clinical Document Architecture (CDA), CEN EN 13606 EHRcom and openEHR are being developed (Sachdeva & Bhalla, 2022). Most of the health institutes around the globe use HL7 which are self-administered Standards. HL7 is an organization which provides a framework to exchange, share and retrieve clinical information through electronic health information (Memon & Khoa, 2019).

Adopting interoperability standards can have a significant impact on telemedicine in Ghana. It can facilitate the use of audio, video, and data communication methods to diagnose and treat patients while protecting client privacy by linking health records (Atiwoto, Kpodonu, & Kpodonu, 2022; Kruse, Williams, Bohls, & Shamsi, 2021). Furthermore, interoperability standards can help to reduce costs and minimize medical errors.

2.13 Architecture for Successful e-consultation

The generic architecture for most E-health initiatives is illustrated in figure 4 which depicts a multi-tiered client-server architecture.
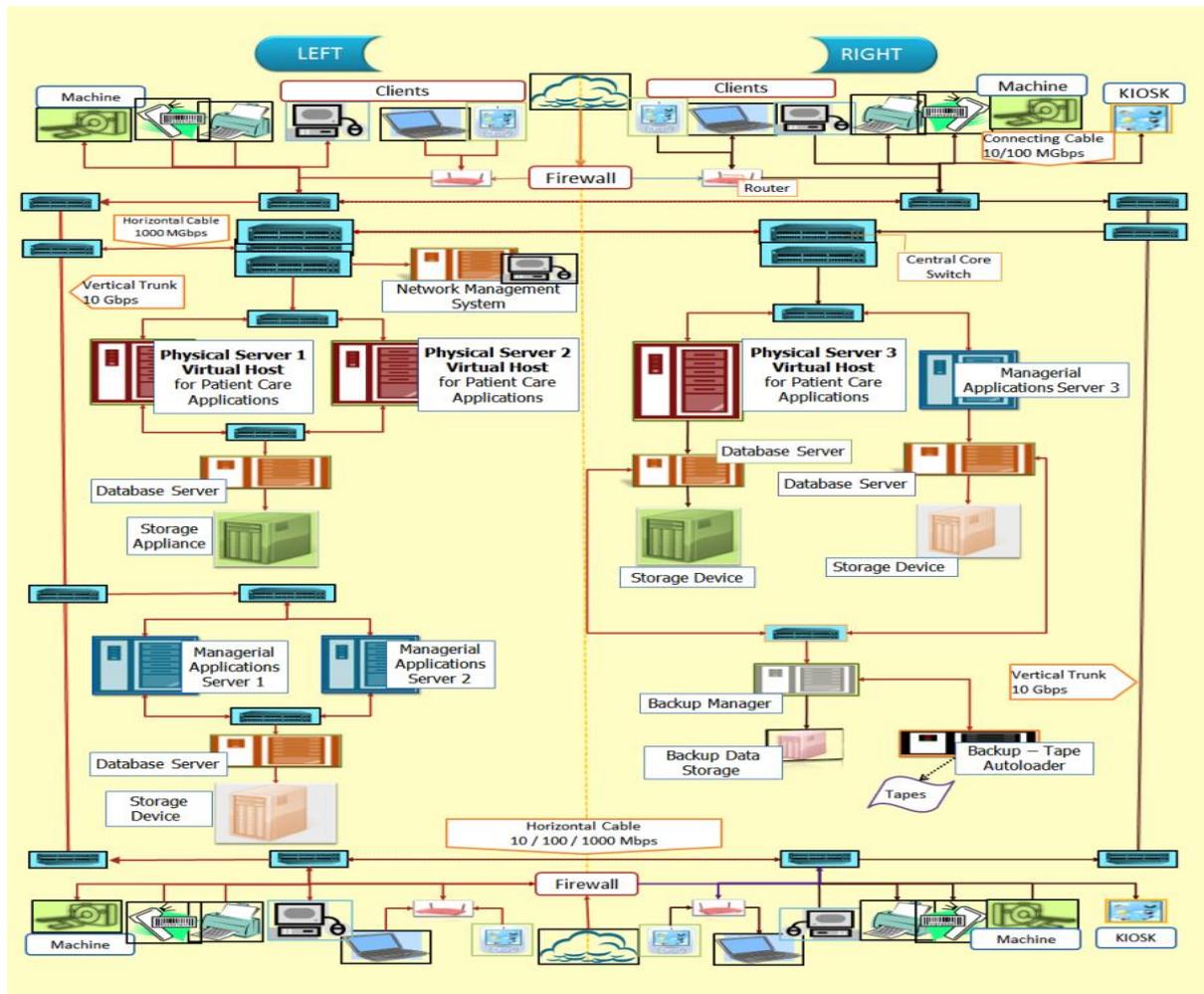
Figure 4: Client-Server Computing Paradigm based Architecture   Source; Salleh (2022)

The architecture connects the various departments in a hospital to a centralised server. Users at various nodes of the networked architecture only need to give a command request to get a response. Networks are now a critical component of the business strategies for organizations to compete globally. A hospital functions 24 hours a day, and every day for 365 days a year, hence the network system should not fail (Salleh, 2022). The Operations Domain cater for day to day use where the data is actual and in real-time. The Analytical Domain allow definite but

not necessarily real-time data to be analyzed to produce reports. This architecture enables doctors to access patients' files and prescribe drugs during e-consultation services.

2.14 Infrastructure for Successful E-consultation

To support a client-server architecture, special attention must be paid to the e-consultation infrastructure. The e-consultation infrastructure includes phone lines, fiber trunks and submarine cables and other high-speed services, satellites, earth stations and teleports that are used by businesses. A sound technical infrastructure is an essential ingredient to the undertaking of e-health initiatives by any nation. Such infrastructure should also include telecommunications, electricity, access to computers and the Internet.

To offer good multimedia content and thus provide a rich E-health experience, high bandwidth is needed. e-consultation considerations are undoubtedly one of the most fundamental infrastructure requirements. Telecommunications constitute a vital infrastructure for Internet access and, hence, for e-commerce.

One of the pioneering countries in establishing a complete and robust e-health infrastructure is Singapore, which is in the process of wiring every home, office and factory up to a broadband cable network that will cover 98% of Singaporean homes and offices (Essén, et al., 2022). Its report on measuring information society indicates that Singapore is among the ten top countries in terms of the proportion of households with computers and Internet access.

2.14.1 Computer-Mediated Communication between Patients and Doctors

Oyeniran, Jayesimi, Ogundele, & Oyeniran, (2020) defined Computer-Mediated Communication as a generic term now commonly used for a variety of systems that enable people to communicate with other people using computers and networks. In the healthcare area, one of the important questions is: How does computer-mediated communication affect traditional doctor-patient relationships? This question is barely answered by current computer-

mediated communication studies because few scholars have examined how computer-mediated communication serves to fulfil the relational functions between doctors and patients (Nurcandrani, 2022). In the context of patient-doctor communication, computer-mediated communication is viewed mainly by academia as a method to seek and share information, build a 'good relationship', and others (ibid).

While information seeking and sharing were suggested by many kinds of literature as the main task of patients and doctors using computer-mediated communication, few literatures focused on the topic of using computer-mediated communication to build and maintain a good relationship between patients and doctors (Liu, et al., 2022). Nevertheless, a very limited number of studies still gave a glance at the benefits of computer-mediated communication on the patient-doctor relationship. Computer-mediated communication plays a vital role in building a trusting relationship between patients and doctors and leads patients to communicate with doctors more comprehensively and thoroughly (Shi, 2020). It also empowers patients to express concerns and preferences and improves patients' satisfaction in the e-consultation environment. Physicians also believe that computer-mediated communication can have a positive effect on doctor-patient relationships by establishing and maintaining rapport with the patient (Yan, Tan, Jia, & Akram, 2022).

Acknowledging the convenience of computer-mediated communication, both doctors and patients are willing to communicate via different types of communication systems (Liu, et al., 2022). However, Patient-doctor CMC has some barriers along with the benefits (Shi, 2020). While it empowers patients on obtaining information and expressing concerns, physicians tend to complain about the heavy workload and reimbursement issues, especially for telephone and message communications. For example, when telephone consultation was first introduced,

doctors were concerned about more and more calls from anxious patients day and night. Similar concerns were raised when messaging communication was introduced. Doctors complained of wasting time on patients' irrelevant messages and questions (Murphy, Satterly, Giardina, Sittig, & Singh, 2019). While most doctors believe in the effectiveness of patient-doctor CMC and are willing to encourage their patients to use them, these complaints somehow prevent the widespread use of CMC in patient-doctor communication (Shi, 2020).

On the one hand, new communication technologies make it easier for patients and doctors to connect. Patients can reach their doctors without physically visiting, and doctors can easily get feedback from patients and avoid unnecessary visits. With limited time and effort, physicians may not be able to respond to all the patients and adequately answer their messages, which may result in a decrease in service quality. Many other concerns are put forward regarding doctor-patient CMC, including trust and privacy (Hilty, et al., 2021; Ge, et al., 2022). Unlike face-to-face consultation where patients send and receive information in the presence of doctors, e-consultation relies on computer-mediated communication between patient-doctor with the intervention of a medium. The differences between the two communication modes are illustrated in Figure 5.
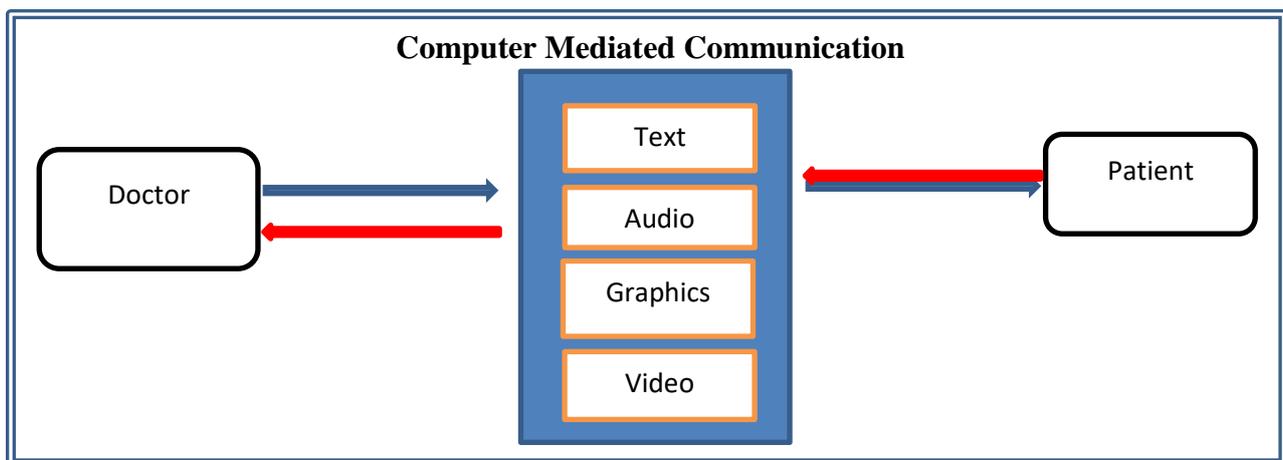
Figure 5: Computer Mediated Communication Source: Lee & Zuercher, 2017

2.15 Uncertainty in e-consultation

Uncertainty is an important aspect that can impact communication outcomes. There are 2 kinds of uncertainty, consisting of cognitive uncertainty and behavioural uncertainty (Berger & Bradac, 1982). Cognitive uncertainty refers to the degree of uncertainty associated with the ideas and perspectives of each other in communication, while behavioural uncertainty describes the degree to which practices are foreseeable in a given scenario (Berger, 1986). Research shows that dealing with uncertainty is the main process that affects our communication with people, especially strangers.

Uncertainty can be found in all areas of medical health practices (Saltelli, et al., 2019). Diagnosis, referrals, treatments, and medical teamwork may generate unpleasant challenges for doctors. Clinical uncertainty can cause stress for patients and mis- or over-use of medicines (Shi, 2020). Numerous research studies have been done to lower physicians' uncertainty throughout medical diagnosis. Gigerenzer, (2020) spent the last 25 years talking explain approaches to dealing with uncertainty in clients with professionals. Their outcomes revealed that using standards in addition to making use of even more patient-centred examinations connects to decreasing uncertainty. Patient-centred treatment is the latest trend in healthcare (Légaré, et al., 2020). A patient-centered system is organized to respond to patient needs without unexpected negative effects. E-consultation may be one of the means through which the system can be reoriented to be more patient-centered. It is recommended that sticking to individuals can decrease either medical diagnosis uncertainty for people or physicians' tension and diagnosis uncertainty (Thompson, 2022).

In the context of e-consultation, clients can be uncertain concerning several aspects of the systems and the physicians (Mold, et al., 2021). These uncertainties may arise from feelings of

not having a physical face-to-face consultation, or discomfort with the chosen media. These uncertainties can affect their cognitions, emotions, and decision-making. Communicating with uncertainty is the essential and initial step in helping patients to manage uncertainty about the quality of consultation to make a good decision. Good patient-doctor computer-mediated communication should give patients confidence that their doctor is an advocate who will not abandon them, thus reducing their uncertainty (Gârdan, Cătoiu, Gârdan, & Borangiu, 2020). In the face of uncertainties, healthcare organizations must be reprogrammed and renewed, repositioning themselves for the future. Therefore, understanding patients' uncertainties during communication with doctors would allow IT specialists to receive guidance to improve system design for the e-consultation framework.

2.16 Patient satisfaction in E-consultation

Patient satisfaction is considered one of the most important quality measurements and essential success indicators in healthcare (Liddy, 2016). Satisfaction is the result of the difference between what is expected and what is experienced (Hayati, Suroso, Suliyanto, & Kaukab, 2020), a post-consumption judgment by the customer that a service provides a pleasing level of consumption-related satisfaction, including under or over-fulfilment. Health system-related factors were shown to have a positive association with patient satisfaction with health services delivery (Amporfro et al., 2021). Patients make judgments regarding the treatment they get from their doctors. Their judgments are based mainly on their assumptions of just how the treatment is carried out. Patients reported satisfaction with services rendered as well as enhanced self-care, communication, and interaction with medical professionals. Satisfaction was also associated with a reduction in distance travelled (Mold and mildew, Hendy, Lai, & de Lusignan, 2019).

A study by Blödt, Müller-Nordhorn, Seifert, & Holmberg (2021) found that health providers' interpersonal care quality was the essential factor for patient satisfaction. Physicians' ability to personalize medical expertise and thereby convey working in the patient's best interest and to treat the patient as an individual and unique human being. At the core of satisfying care experiences lies a doctor-patient relationship with a profoundly humane quality. When it comes to e-consultation, providers' communication skills and listening skills are very important, as they have a positive association with the level of patient satisfaction (Qi, Cui, Li, & Han, 2021)

Identifying the aspects associated with patient satisfaction is a vital subject for individuals to understand what is valued by patients, as well as how the quality of care is perceived by patients, and to identify where, when and how service adjustment and improvement can be made. Much research has been done on the influence of the qualities of physicians and systems on patient satisfaction in the healthcare sector. Physicians' communication abilities and the level of information tend to affect a patient's perspectives during e-consultation, which also has the potential to affect a patient's level of satisfaction.

2.17 E-Consult online indicators

In the e-consultation context, the role of indicators becomes important because doctors use intelligent signalling mechanisms not only to communicate socially with patients but also to show their expertise. This strategy is in line with the signalling literature in game theory: by sending signals, one party can credibly pass on some private information about itself to another party. E-consultation websites display some indicators that users can observe to understand the physician's quality. As mentioned by Yu, Samuel, Yalçin, Sultan, & Kamath, (2020) 59% of

US citizens believe that online doctor ratings are "satisfactory and somewhat important when they searched for excellent quality clinical services and physicians.

Online signals are obtained from virtual consultation-based platforms, including online reputation. There are indicators or information exchanged unconsciously or unknowingly between different doctors and patients such as word of mouth and attitude or body language (Li, Tang, Yen David, & Liu, 2019). Patients and physicians display different indicators on e-consultation websites, affecting patients' cognitive abilities to choose a good doctor (ibid). People obtain information regarding the quality of healthcare services rendered by physicians through different indicators such as the reputation of the physician, title, education, experience and online effort to address the concern of the patient; this help to minimize information asymmetry (Hong, Liang, Radcliff, Wigfall, & Street, 2019). Earlier research indicated that receivers are sovereign decision-makers. Therefore, some e-consultation platforms permit patients to express their satisfaction and dissatisfaction with a physician by writing positive or negative reviews (Shah, Yan, Tariq, & Ali, 2021). The patient's feedback is reflected as the affective reactions of peers toward their experience with the quality of service that s/he gets from that doctor. Based on this assessment, patients make more rational decisions while selecting a doctor for e-consultation.

A study by Shah, Naqvi, & Jeong (2021) demonstrates that individual physicians' online reputations on e-consultation websites were positively associated with the patient's choice to book appointments online with that physician. Hong, et al. (2019) indicated that online reputation and knowledge contribution signals significantly positively influence patients' online choice to pay higher prices to physicians. In another study, the impact of online

physician indicators in e-consultation is found significantly positive on physician volume of online bookings (Li, Tang, Yen David, & Liu, 2019). Also the higher a family doctor's online reputation and knowledge contributions on virtual platforms, the greater his/her private benefits (Shah, Naqvi, & Jeong, 2021) .

Khurana, Qiu and Kumar (2019) reported that doctors' online responses as knowledge contributions on online healthcare portals could be regarded as a significant signal of clinical service quality. Furthermore, physicians' online reputation on virtual platforms reflects a signal of quality (Shah, Muhammad, & Lee, 2022). The patient's choice is significantly affected by the physician's reputation and effort online. Greenwood, et al. (2019) showed that a physician offline reputation in the form of high-level expertise significantly influences physician behaviour to adopt new information in an online environment. Shah, Naqvi, & Jeong, (2021) revealed a positive correlation between physician capital as offline reputation and patients' choice of online physician selection. In addition, physician reputation and benevolence as an effort online were found positively related to the patient assessment of physician performance (Yang, Diao, & Kiang, 2018). Moreover, Ouyang, Wang, & Chang, (2022) also indicated physician online reputation and self-representation as information signals in the e-consultation market. Several other studies also indicated that online reputation in the form of online physician reviews affects patients' choice to choose the best doctor online. Keeping in view the notion behind signalling theory, signalers (physicians) transmit signals to receivers (patients). Patients can then evaluate these signals to choose an expert healthcare provider who can provide them with quality health services.

2.18 Doctor-Patient Attitudes

As cited by Kurasz, et al., (2022) the principle of progressive medical practice has been shared decision-making, which rejects the "doctor knows best" approaches to care, prioritizing the preferences and goals of patients. In the past, individuals placed their lives in the treatment of medical professionals in a blind trust that the physicians would look after they disappears (Shah, Yan, Tariq, & Ali, 2021). It appears that trust relationships in healthcare are transforming. Karatas, Caldwell, & Scott, (2022) contrasted the patient-doctor attitudes to the parent-child connection. The doctor knows what is good for his patient and the parent knows what is good for the child. They listed some virtues that can be attributed to traditional doctor-patient attitudes: fidelity to trust in the doctor integrity as an expert whose intellectual knowledge and practical wisdom are trustworthy; the benevolence of doctor's intentions and attitudes towards their patients; effacement of the self-interest of doctors helping their patients through the recovery process; compassion and caring of doctors towards their patients; Intellectual honesty of doctors towards their patients; Medical humility on behalf of doctors in wisely judging that the cure is no worse (long term) than the disease (Schein & Peter, 2021). Due to the fact that the unique power and expertise experts have and others have not and count on, trust between clients and specialists can exist.

The degree of dependence suggests individuals have a couple of alternatives however to trust both their intellectual merits such as judgment needed in analysis abilities as well as merits of personality, such as their capability to inform the reality while at the same time being thoughtful. When it comes to developing a trusting relationship Waller, et al., (2020) stressed the continuing importance of personal relationships and face-to-face contact. There is the problem of developing a close partnership of trust, based on individual expertise and

understanding, it is nonetheless feasible to create a short-term connection between physician and individual.

2.19 Trust in E-consultation

Newman & Ford, (2021) stressed the importance of one on one relationships in maintaining and building trust. When it comes to e-consultation, trust matters. Trust is a key factor when it comes to the future image of e-consultation. Trust play a role when it comes to determining people's intention to engage in e-consultation.

Trust and risk are interconnected therefore if there is no risk there is also no question of trust. As long as it is known that medical errors and cost containment are associated with distrust of health care systems there is risk involved (Levine, Carmody, & Silk, 2020). Wolfensberger (2019) mentioned that trust is an expectation regarding contingent behaviour, it implies a situation of uncertainty (risk). In the article of Calnan (2020) is assumed that trust relationships are characterized by one party, the trustor, having positive expectations regarding both the competence of the other party, and the trustee and that they will work in their best interests. They assumed, in the context of healthcare, there have been changes to both interpersonal trust relations and institutional trust relations. Calnan (2020) explained these two types of trust. 'Traditionally, patients have placed high levels of trust in health care professionals. Such interpersonal trust relations have been typified by a type of blind, embodied trust that developed as a result of a patient's knowledge of and relationship with their personal physician. Institutional trust in healthcare practitioners in general, healthcare organizations and systems have also tended to be high. This may well have been the effect of patients' high level of interpersonal trust in their doctor, and have been due to the clinician's professional status, and the relatively recent provision of health care as a state-guaranteed welfare right' (Lemmers &

van der Voort, 2021). This indicates that a patient-doctor relationship has to be based on trust.

As described in the medical ethical code, one major goal of the doctor is to build a trustful

relationship (GMC, 2022). Also, the patient or consumer of health care has to trust that the

agent, doctor, nurse or other professional has the right knowledge and will apply it in his or her

interest.

Calnan (2020) argued that trust has traditionally been considered a cornerstone of effective

doctor-patient relationships. They relate the need for interpersonal trust to the vulnerability

associated with being ill, the information arising from the specialist's nature of medical

knowledge and the element of risk regarding the competence and intentions of the practitioner

on whom the patient is dependent. However, whether we trust or distrust our doctor, we have

no choice even if there is the highest risk people can have, losing their lives.

2.19.1 The changing role of trust in healthcare

As times change, health systems also change. The era whereby people have long-term medical

doctors for several years could be over quickly. Trust is important for maximising results

because it can inspire active involvement in treatment such as adherence to referrals as well as

uptake of services, which include emergencies (Falcone, et al., 2020). Trust is forward-looking

and reflects a commitment to an ongoing relationship, whereas satisfaction tends to be based

on experience and refers to the assessment of performance (Zhao, et al., 2021). Top-quality

treatment both good care for patients and good personal experiences can result in individuals'

health and wellness, self-confidence and health systems (Vashu, Masri, Huei, & Lee, 2022).

2.20 Factors influencing Patient attitude to e-consultation

A research study by Finnegan (2019) discloses that 9 in 10 individuals rated medical

professionals as one of the most relied-on occupations. Individuals might be much less reliant

on varying methods for good health, yet they still have to rely on their physicians. The realization of brand-new types of trust in e-consultation needs better communicative skills on the side of clinicians (Wan, Zhang, & Yan, 2020). They need to ensure that patients have all the necessary information about their condition and identify and express their patients' concerns. There is an ongoing need to maintain and create trust between the patient and the clinician. Some variables that motivate patients to rely on clinicians are: communication actions and a guarantee of physician's care (Gupta, et al., 2020), individual-focused treatment, shared decision-making, regard for the doctors, knowledge of the individuals, gender, age, race, education and degree qualification, and socioeconomic condition and the physician's communication behaviour (Berger, et al., 2022; Saha & Beach, 2020) .

Patient involvement only produced higher trust when patients wanted to participate. For instance, Akrami (2021) did a study on Patients' perspectives on e-consultation in Sweden. It was found that Swedish e-consultation self-efficacy has a positive influence on people's usage of these services. However, the positive perception does not always influence the decision toward the level of usage of e-consultation. The following are some factors that influence patients' attitudes to e-consultation:

a) Privacy concerns and System Security

Security and privacy concerns are pivotal in the successful implementation of e-consultation. Current Information Systems research has not yet incorporated an inter-organizational perspective on the digital transformation of healthcare due to insufficient academic research and industry adoption of rightful technology (Hermes, Riasanow, & Clemons, 2020). Some medical care practitioners question the worth of electronic innovations used in hospitals and at

times feel that this modern technology hinders their job. Medical staff usually report not having possibilities for getting the needed skills to place these technologies to full usage. These staffs request proper safeguards against the prospective unwanted outcome of using these electronic devices, consisting of a lack of transparency or dangerous privacy information (OECD, 2022).

The interoperability of health IT between key stakeholders is lacking, which hampers efficiency, undermines coordination of care, and increases costs (Hansen, 2020). When services do not match the demands of patients, costly modern technology projects can be unsuccessful. Iriani & Andjarwati, (2020) concluded that while perceptions of usefulness are the strongest determinant of acceptance, the ease of use of the service seemed also a very important factor. The needs of patients have to be studied to determine the factors influencing the intention to engage and determine the role of trust in considering the usage of e-consultation. This is because, e-consultation cannot exist without technical tools for data processing, a computer network that transports information on the Internet and a receiving computer system.

Participation in these technological systems comes with some sort of risk. Information can be unintentionally gotten rid of and there is constantly the opportunity that information will be unlawfully accessed. This implies that an individual for whom the information was not meant, will obtain them. To put it simply, the dependency on technological systems entails dangers. Fox, Bettis, Burke, Hart, & Wang, (2022) in their study found barriers to effective service use among adolescents do include fear of confidentiality breaches. In the e-consultation environment, it is not only important to address security and privacy issues (which are usually in the focus), but also safety needs for appropriate treatment, hence, online healthcare providers

must seriously consider having strong personal privacy statements and protection attributes to increase consumers' trust (Trček, Abie, & Skomedal, 2022). They attribute the pattern of the position (safety greater than personal privacy) to the possibility that security features are better understood and easier to identify than privacy statements, which might give a different meaning to various people. Nevertheless, they also claim that these features may not be sufficient to earn customers' trust since other characteristics may also be of influence (e.g., the company's reputation, website cosmetics, and other website features)'.

b) Financial Costs and Efficiency

Two prospective issues that may impact service evaluation and intend to use e-consultation are cost and efficiency (Ionescu, de Jong, Drop, & van Kampen, 2022), which contain both money and time investments (Keuper, Batenburg, Verheij, & Van Tuyl, 2021) studied perceived financial resources, which is the understanding of the capacity to sort out economic prices. They found out that high sources led to a higher intention to utilize mobile solutions. In the domain name of e-consultation, costs related to getting access to medical services using the internet or mobile technology and the exactcost of medical services are potential concerns that might affect users' evaluation of service and intention to use.

In terms of efficiency, the time has been interpreted as the speed of delivery (Sundström & Tollmar, 2018) and waiting time in the context of the Internet and electronic usage, both of which have been found to have significant impacts on overall perception. The time spent gathering information has a negative impact on website evaluation. Notwithstanding, Ruberto et al. (2022) saw that in analyses that adjust for disease severity, African Americans are more prone to rely on self-care strategies such as prayer and to be less inclined to explore interventions.

c) Perceived Ease of Use

Perceived ease of use has been proven to have a significant influence on the intention to use by numerous researchers (Malik & Annuar, 2021; Qashou, 2021). Generally, ease of use refers to accessibility to service and technology operations. For example, it has been pointed out in previous research on the internet revisiting that the ease to find information and navigating is one of the most important determinants (Bandyopadhyay, Stanzel, Hammarberg, Hickey, & Fisher, 2022). In the evaluation of telemedicine service experience, the ease of equipment use and availability of such equipment and medical resources are identified to have influences on the perception of services (Campbell & Goldstein, 2022). It makes intuitive sense if getting needed information is difficult or the whole service delivery process is complex, customers probably would have negative perceptions of the quality and less intention to use it next time.

d) Perceived Usefulness

Similar to perceived ease of use, perceived usefulness is also a major concept that originated from technology acceptance studies (Abrams, Dautzenberg, Jakobowsky, Ladwig, & Rosenthal-von der Pütten, 2021), which means that customers consider the technology system to be useful in improving their performance. The positive outcomes of using the system is also related to positive perceptions of usefulness. In telemedicine studies, it has been proved that patients have great concerns about the success of treatment (Mold, Hendy, Lai, & de Lusignan, 2019), efficacy or the success of outcomes (Almathami, Win, & Vlahu-Gjorgievska, 2020). These factors can be used as sub-dimensions or substitutes of perceived usefulness to measure telemedicine perception and satisfaction.

e) Lack of Patient Privacy Protection

The privacy of patients is one key challenge in the implementation of e-consultation. Privacy is paramount when storing and transmitting electronic data. Without trust that patients' most sensitive health information will be safeguarded, patients would be reserved to fully and honestly disclose personal information and may avoid seeking care online. Medical Health facilities should keenly pay attention to inappropriate access, misuse, and disclosure of personal privacy (Hong, Chan, & Thong, 2021). Once such data are handled improperly, patients will be faced with privacy invasion, such as negative social stigma, as well as straining of family ties, losing control of medical information, and suffering harassment from commercial advertising (Dang, Guo, Guo, & D., 2020). Without privacy protection, details of e-consultation could be rendered publicly available to other internet users. To overcome this issue, legal regulation is needed to reduce resistance to adopting and using e-consultation by the public. We have to ensure that patients have trust in the system and that their personal information is protected.

f) Lack of friendly Government E-consultation Policies

In many parts of the world, e-consultation policies are not developed. In Japan, eHealth-friendly policies are not being developed because policymakers have less exposure to eHealth discipline and the potential benefits of this area (Qureshi, Farooq, & Qureshi, 2021). Several governments in the world are making effort to develop eHealth Policies but do not have a specific policy for regulating the usage of e-consultation. There is a need for the development of an e-consultation System policy framework for sustainable online healthcare.

g) Low level of encouragement to utilize e-consultation

Currently, most health service providers are very cost-conscious so there is room for people to adopt e-consultation which looks a bit cheaper. However, some doctors do not have the needful reason or encouragement to adopt e-consultation. For instance, some doctors see e-consultation as an added burden in addition to their routine duties. For some doctors, e-consultation comes with an added expense. For example, it may be challenging to organise video consultations on a busy day (Eddie, et al., 2019). The tariff charged by Telcos does not have a special discount on payment for medics who use e-consultation.

h) Negative perception

Negative perception forms part of the factors driving people's prior reluctance to adopt e-consultation (Smith, et al., 2020). This is also a result of its complexity, its significant changes to the way healthcare professionals practice, and perceptions that e-consultation was not immediately effective, safe, or even common, therefore many providers decide not to use it (ibid). It is found that some people with recent experience with e-consultation have mixed views about the potential for reliable diagnoses via e-consultation in different situations.

In some situations, a physical examination is not required and the patient's history can be sufficient to make a diagnosis. On the other hand, diagnosing without a physical exam and visual information can be very challenging in some cases, with the potential risk of error. However, a recent study by (Kichloo, et al., 2020) showed that this inability to conduct direct physical examinations has been partly mitigated by involving patients in reporting their own data (e.g., their temperature) and by using video consultations to allow providers to observe patients' general appearance and symptoms (e.g., breathing, coughing). According to Wijesooriya, Mishra, Brand, & Rubin (2020), healthcare service providers have also

rediscovered the importance of taking a complete medical history of patients and honing their observation skills to establish a diagnosis. There is therefore the need for a concrete guiding principle to ascertain medical cases that can be most appropriately managed by phone call, video, or in person.

i) Role change challenges

The outbreak of Covid 19 gave healthcare providers a reason to change and adopt a new model of consultation which was an additional difficulty during the crisis moment (Smith, et al., 2020). Donnelly, Ashcroft, Bobbette, Mills, Mofina, & Tran (2021) mentioned the need for providers to modify roles and practices because there is compatibility and incompatibility of some health professional roles in the implementation of e-consultation for patient care. During Covid 19, some professionals took on more tasks and had to adapt or assume new roles to support crisis management in their clinics. It is therefore advisable that to ensure efficiency and maintain working staff, training should be organized to address the diagnostic and administrative challenges faced by healthcare providers.

j) Lack of Education

When it comes to e-consultation, education of the general populace and medical staff is important in developing observational skills that need to be rediscovered and honed to establish a diagnosis remotely (Wijesooriya, Mishra, Brand, & Rubin, 2020). Rolling out e-consultation efficiently requires that medical staff should be trained and equipped to use the various consultation tools, while also adapting to patients' needs (Murphy, 2021). The lack of education on the benefits and availability for patients to use e-consultation derail the successful adoption and implementation of e-consultation in the health sector. Patients must be taught that

the social and emotional expectation aspect of seeing a doctor in a face to face consultation, if not fully met can be met at an appreciable level when using e-consultation.

k) Therapeutic relationship challenges

Physical examination is a foundational element of the therapeutic relationship between a doctor and a patient (Bergman, Bethell, Gombojav, Hassink, & Stange, 2020). A major challenge includes conducting a physical examination through the use of e-consultation. Since the physical examination is a cardinal part of a face-to-face consultation, doctors can build a close relationship with their patients (Shankar, et al., 2020). However, this relationship becomes difficult to establish by using only e-consultation especially when the doctor has no previous relationship with the patient (Srinivasan, et al., 2020). Studies have also highlighted the risk that telehealth modalities can compromise the therapeutic relationship and continuity of care, aspects of care delivery that are central to clinical practice and profoundly significant for both patients and clinicians (Breton, Sullivan, Deville-Stoetzel, & al., 2021; Srinivasan, et al., 2020)

l) Low Technological Literacy

Technological literacy and logistical barriers to participating in e-consultation are a challenge for some doctors and patients. Looking at the different technologies available and the space in which medical technologies development is increasing, some medical staff find it difficult to catch up (Donnelly, et al., 2021). These challenges can make users prefer face to face consultation to e-consultation.

m) Inability to perform the physical examination

A study done by Catapan, & Calvo (2020), found that some limitations of e-consultation include the inability to perform a physical examination therefore it is not recommended for the first consultation. With e-consultation, it is at times it is impossible to perform a physical

examination, and also difficult to estimate how the patient is doing (Bos, van Tubergen, & Vonkeman, 2021). Elements of the physical examination that are easily observed show high concordance, but posterior structures and elements that are difficult to observe using consumer communications technology limit the utility of physical examination (ibid). Patients who would need physical examination would find e-consultation not relevant.

n) **Data Security**

Many studies have found that the key barriers to using e-consultation for patients are privacy concerns and the security of their data (Qi, Cui, Li, & Han, 2021; Bos, van Tubergen, & Vonkeman, 2021). The growing concern of privacy and data security issues shows that healthcare providers should strengthen the development of e-consultation information systems. Based on the findings of Seh, et al., (2020), privacy disclosure has been a big problem in the medical field. Users worry about not only the illegal disclosure but also the exposure to their family members with special diseases such as mental illness. The open disclosure of patient-identifiable health information to parties that may act against the interests of the specific patient or may otherwise be perceived as invading a patient's privacy. These concerns arise from the many flows of data across the health care system, between and among providers, payers, and secondary users, with or without the patient's knowledge

o) **Lack of Technical onboarding support services**

Patients require varying amounts of support to use the technology depending upon their familiarity with technology. One major challenge is the lack of technical onboarding support services to assist patients to setup e-consultation services, together with patient-end challenges with troubleshooting, which is a common barrier to adopting e-consultation (Thomas, de Camargo Catapan, Haydon, Barras, & Snoswell, 2022)

p) Other Challenges

Thomas et al. (2022) did a study on Physician's perception of e-consultation adoption amid of COVID-19 pandemic. The researchers found various challenges influencing the adoption and usage of e-consultation. These challenges are listed as follows:

a) Medical professionals are not able to read body language and non-verbal cues

b) Harder to build rapport and trust

c) Difficult to connect with patients even when pre-booked

d) More challenging with patients having speaking or hearing difficulties, mental or cognitive impairment and language barrier

e) The assumption that patients are resistant to change

f) The assumption that older patients are not able to use technology

g) The assumption is that patients lack the right resources; digital devices, data, good internet

h) Peer influence of doctors for patients to align with forms of consultation that is convenient for them

2.21 Technological Framework

While the value of information technology in lowering rising health care prices and improving high-quality services is significantly being identified, considerable difficulties stay in just how it is applied (Kichloo, et al., 2020). The execution of IT systems is intricate and calls for proficiency and flexibility to make it function. The proficiency could be the understanding of the context of the requirement for such systems, the choice of one of the most proper systems that will give value to customers and which will be lasting. Several variables have been found as essential variables in specifying the effective implementation of e-consultation.

'Infrastructural plans', nevertheless, play a main function and remain incredibly crucial in the case of 3rd and middle-income countries (ElMassah & Mohieldin, 2020).

Key technical areas are required to sustain the effective implementation of e-consultation. These essential technical classifications are identified as Equipment; Network; Associated software programs and health providers' previous IT experience. Technological readiness needs that these technical areas work correctly and dependably when required and should be positioned at the easiest reach of medical professionals (Ionescu, de Jong, Drop, & van Kampen, 2022). This also means putting in place data and interoperability standards so that information feeds fluidly back into and informs national and sub-national health management information systems.

According to Kissi, Dai, Dogbe, Banahene, & Ernest, (2020) healthcare providers' ability to freely and easily access and use this technological equipment has a profound impact on their behavioural intention to accept the innovation. This resulted in increased efficiency, quality of services, quality patient care delivery, and satisfaction among physicians in using telemedicine services. The findings of Bisrat, Minda, Assamnew, Abebe, & Abegaz, (2021) in research study, discovered that the main aspect of the acceptance of an electronic health system is the preservation of physician time, enhancing system speed, decreasing time spent waiting for the availability of a computer system, and reducing time spent in recording care given to a patient. This search makes ease of access an essential factor to consider in a physician's choice to utilize wellness information systems. In electronic technology, networking was the groundbreaking technology/innovation which changed the landscape for using ICTs. It is no longer sufficient enough to design just standalone devices, therefore a computer alone is no more the main

function of computer-based systems, instead, it is the node on the network (Amiri, Waiker, Rueppell, & Manda, 2020).

The World Health Organization (2018) mentions that digital health interventions call for making use of computer systems in the form of physician electronic assistance, digital health records, electronic physician order entry systems, patients, healthcare facilities, labs, x-ray centres and other stakeholders. E-consultation is therefore instrumental in the categorization of the different ways in which digital and mobile technologies are being used to support health system needs. Readily available high bandwidth and fast internet services can offer multimedia content, providing healthcare providers with a rich e-consultation experience (Coombes & Gregory, 2019; Gardašević, Katzis, Bajić, & Berbakov, 2020). The lack of appropriate tools and computer systems/utilities to access relevant and quality healthcare information continues to deprive developing nations of realizing the full potential of the networked world. The assessment of existing network capacity also involves healthcare providers' perception of the reliability and stability of Internet access. Without having the right Local Area Network (LAN) and an internet connection, intra-organizational and inter-department communication would be hampered. This is because, the LAN is the backbone of any information system within an institution (Norvell, 2021).

2.22 Regulatory policies

The existence of policies at the government and organizational levels to address common issues such as liability, reimbursement and licensing, is critical to the adoption and use of e-consultation healthcare providers (Oni, Oni, Ibietan, & Deinde-Adedeji, 2020; Konnoth, 2020). As stated by Jennett et al (2005), there are three parts to fundamental policies at the organizational level namely:

- Repayment and monetary reward to medical staff and health facilities which affects their behaviour intent to accept and use electronic health systems such as e-consultation;

- Health care providers' responsibility;

- Patient's privacy and jurisdiction, have a straight influence on medical staff usage behaviour. The prospective advantages of computerization could be highly significant, however, e-consultation comes with new responsibility threats for healthcare companies that have gotten little interest in its legalities (Mold, Hendy, Lai, & de Lusignan, 2019). Significant among these possible liability risks are data entry errors, unexpected results of automation, and insufficient training, resulting in disparities in processes, and prospective under-or over medication via respective suppliers.

2.23 Cost associated with E-consultation

E-consultation implementation is capital intensive (Ramalingam, 2022), not only for initial cost, e.g. feasibility and consultation, accessible external technical support and system maintenance but also to support project management (e.g., labour costs) and high maintenance costs such as the purchase/upgrade of ICT infrastructure (i.e., hardware, software and Internet access). As a result, adequate funding is relevant for continuing professional development. For example, organizational change management (e.g., end-user training conducted by the eHealth vendor and/or employment of an external e-consultation expert who is familiar with the different applications and can transfer knowledge to users). Notably, Cerchione et al. (2022) indicated two categories of costs associated with electronic Health systems implementation: system costs and induced costs. System costs include the cost of the software and hardware, training, implementation, and ongoing maintenance and support. Induced costs are those involved in the transition from a paper to an electronic system, such as the temporary decrease

in provider productivity after implementation. E-consultation is a new mode of seeking health care therefore there is a need to develop different frameworks that enable e-consultation to be widely used (Oni, Ibietan, & Deinde-Adedeji, 2020). Policies that promote government and hospital management support for e-consultation are associated with a greater likelihood of telehealth adoption, whilst policies that require private or personal support have a reduced likelihood of adoption.

2.24 Technical Support for E-Consult implementation
For the success of e-consultation applications, doctors must be given the chance to work jointly with IT staff to spell out the specific requirements affecting their tasks (McMaster, et al., 2022) and they can only do this with an appropriate level of IT skills. Healthcare provider IT skills can be measured through training received or direct experience in using e-consultation systems (McBain, et al., 2019). Healthcare providers' IT skills can also be assessed using measures including the regularity of using computers, the Internet, emails and other devices available at work. Healthcare providers' perception of computer self-efficacy has a direct impact on their use (behaviour) of the usage of e-consultation to accomplish clinical tasks. Hossain et al. (2019) also found that health computerized information systems require skilled personnel for their effective operation. Training is one of the most important considerations when implementing any new technology.

Measures to assess the capacity of technical support include the availability of IT support for troubleshooting at the healthcare organization and the providers' perception of service efficiency and effectiveness. In general, most researchers envisage that irrespective of the status of trained professionals in HIT and allied areas today, the next decade will see a severe increase in demand for such professionals (Kumar, 2020).

2.25 Need for Change and Organisational Readiness

E-consultation implementation plans might ignore the part people play in healthcare system improvements by focusing on the financial and technical sides associated with organisational change, especially in developing countries. Researchers believe that digital health projects and organisational change approaches should be considered to ensure successful implementation (Dendere, Janda, & Sullivan, 2021).

Weiner, Clary, Klaman, Turner, & Alishahi-Tabriz, (2020) argued that readiness is involving both individual differences and structural factors, reflecting the extent to which the organisation and its members are inclined to accept, embrace and adopt a particular plan. Further, they assert that the implementation and diffusion literature has focused most heavily on the implementation phase of the process with less emphasis on the exploration phases such as readiness (also known as pre-implementation) or the sustainability phase (also known as post-implementation).

For an organisation to use new technologies, it should go further than the technical implementation which should be a multidimensional process to transform the organisation to the required technological changes (Holmström, 2022). He further indicated the rule of three pillars to successfully implement changes and these three pillars are people, process, and technology as shown in figure 6. These three pillars should be working with and supporting each other which might provide a successful technological implementation achievement within the organisation to provide a service or a product. Likewise, e-consultation implementation in hospitals revolves around these three pillars. Having the right people with a technological set of mind, the right technology and efficient processes will yield the successful implementation of e-consultation and its derived benefits.

It has been observed that in today's world, hospitals are investing in the readiness process in which the integration of all the influencing factors is done to make the procedure successful and should help them in becoming productive and efficient.
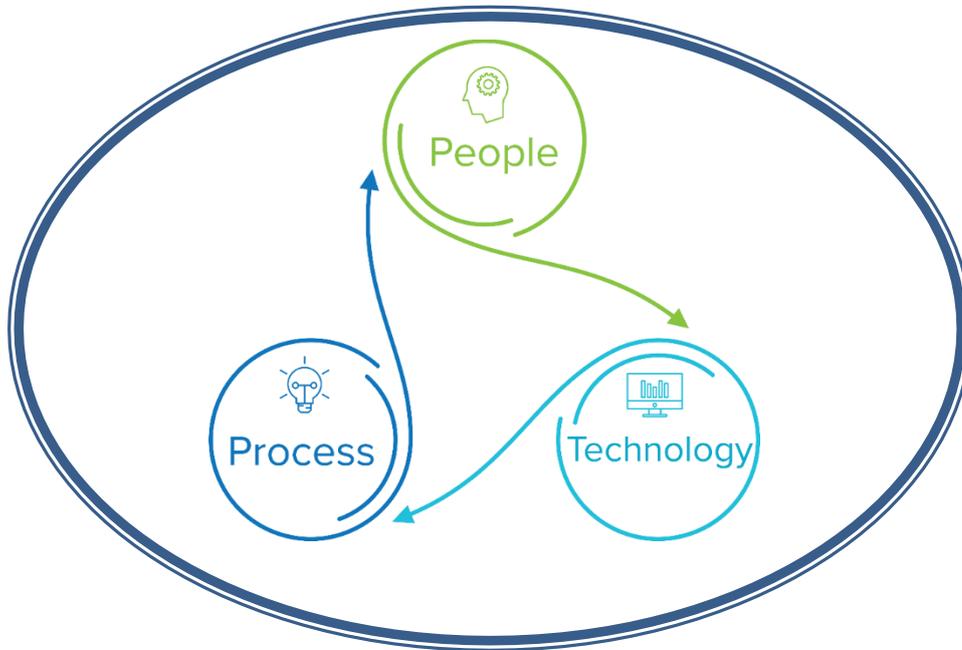
Figure 6: The three pillars   Source: Google Images, 2021

Studies suggest that the failure of organizational readiness for project implementation is largely due to organisational and social factors, rather than technical factors (Zhang, Sun, Yang, & Wang, 2020; Huang, Rahim, Foster, & Anwar, 2021). In this research, it was found that almost all the issues were identified as problematic in the failure and these include, but are not limited to, understanding the needs of users of the system, including issues unrelated to the system itself, users' involvement in the development process, an improvement in the availability of resources, users' acceptance levels, and the preparation of infrastructure projects to develop confidence. All these issues will be under consideration during the development of this research framework work. Bagrationi & Thurner (2020) advocated that the focus should be directed on

readiness, which was defined as an individual's beliefs, attitudes, and intentions regarding the extent to which changes are needed and the organisation's capacity to successfully undertake those changes.

2.26 Gap in Literature
The review of the literature shows a lot of gaps that need to be filled. Salisbury, Murphy, & Duncan (2020) did a study on the impact of digital-first consultations on workload in general practice. They found out that usage of e-consultation and video consultation in the United Kingdom is generally very low. Similarly, Adams, Lim, & Huang, (2022) researched the Practice of Psychiatric e-consultation. The study suggested that Primary care Physician (PCP) utilisation of e-consultation was low. However, the researchers failed to establish what accounts for the low patronage of e-consultation. This research tries to fill the gap by investigating how the attitude of clinicians and hospital staff affects the implementation of e-consultation. Moreover, most studies in the literature were conducted within a single health care system. Hence it failed to bring out a comprehensive assessment of e-consultation usage. This study was therefore conducted in multiple health facilities to help close the knowledge gap between providers and users on the usage of e-consultation and increase the understanding of the factors that influence e-consultation acceptability.

The methodology of reviewed literature mainly relied on observations, experimental trials and Synthesis of already published papers. Researchers were not able to use this methodology to outline a framework for e-consultation acceptability. In addition, cross-system empiric studies are lacking resulting in a limited in-depth understanding of many outcomes. This study therefore use a sequential exploratory method to gain an in-depth understanding on the E-consultation phenomenon to develop an e-consultation framework that enhances acceptability

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by healthcare workers and the general public. Research still lags behind the enthusiasm of policymakers, healthcare systems leaders, and others involved in the implementation of e-consult. A framework for e-consultation acceptability would therefore help alleviate these challenges, provide better reassurance to patients about privacy, and incorporate e-consultation as part of a manageable clinical workflow.

Table 2: Literature review summary

Topic	Key Points	Findings	Limitations	Gap Addressed	Authors
E-health Conce-pts	Broad term encompassing the use of technology for healthcare	Improved information access, communicatio n, and patient education	Lack of common ground on definition	Provides context for e-consultation within broader e-health landscape	Jung et al. (2022), Wickramasing he & Tatnall (2018), Khan et al. (2019), André (2018)
E-health in Develo p-ing Count-ries	Telemedicine as a promising solution for limited access to healthcare	Indonesia pilot project: 47% satisfaction, 47% cite poor internet as an obstacle	Limited research on impact and readiness	Lacks an in-depth understand-ing of e-health implementa-tion in developing countries	da Fonseca et al. (2021), Indra et al. (2020), Jiang et al. (2021)
E-consult -ation Out-look	Potential to address healthcare challenges	Uncertainties around definition and impact	Limited research on non-experimental methods	Needs qualitative research on communica-tion and user experience	Chidhau et al. (2021), Jacob (2020), Abid et al. (2021), Abbott et al. (2018), Wasserman et al. (2019), Almathami et al. (2020)

Ghana's Health System	Progress in expanding infrastructure	High communicable & chronic diseases	Accessibility issues for tertiary & secondary care	Lack of research on e-consultation integration	Escribano-Ferrer et al. (2016), Amponsah (2017), Andoh et al. (2021)
Mobile & Internet Usage	High mobile coverage & connection	Lower internet usage among health workers	Infrastructure & socioeconomic constraints on patient use	Need for research on user experience & adoption	Shiferaw & Mehari (2019), Sutton et al. (2020), Daraz et al. (2019)
Theore-tical Frame-work	DeLone & McLean IS Success Model	Links system, service quality, use, satisfaction, & net benefits	Limited research in e-consultation context	Applies D&M model & Diffusion of Innovation	DeLone & McLean (2002, 2003), Ruth et al. (2019), Minsun & Heui (2020)
Diffus-ion of Innova-tion	Rogers' model explains technology adoption	E-consultation stages: knowledge, persuasion, decision, implementation, confirmation	Need for research on e-consultation adoption stages in Ghana	Provides framework for analyzing e-consultation diffusion	Rogers (2003), Opoku et al. (2015), Stanton et al. (2015)
Empi-rical Studies	Mixed evidence on e-consultation effectiveness	Potential to reduce wait times, improve access, & lower costs	Limited research on patient experience & specific medical conditions	Informs understanding of e-consultation impact & potential benefits	Van Dijk et al. (2022), Yang et al. (2019), Ajitabh & Anjan (2021)

Benefits & Challen-ges	Improved access, communication, & self-care	Privacy concerns, complexity, & digital divide	Need for policy framework & implementation strategies	Highlights advantages & disadvantages of e-consultation for Ghana	Mold et al. (2019, 2021), Qi et al. (2021), Møller et al. (2021)
Patient & Physic-ian Attitu-des	Varying degrees of satisfaction & acceptance	Facilitating conditions, effort expectancy, social influence & performance expectancy influence adoption	Need for targeted interventions to address concerns & encourage use	Explores the role of attitudes in e-consultation implementation	Marcos et al. (2020), Dash & Sahoo (2021), Alhajri et al. (2021)
Impact	E-consultation has the potential to improve healthcare in Ghana	Further research needed on adoption, user experience, & specific applications	Provides initial evidence base for e-consultation implementation in Ghana	-	Salisbury et al. (2020), Adams et al. (2022)
Patient Satisfac-tion	Patient-centered care, clear communication, positive online reviews	Higher satisfaction associated with better quality of care	Studies may have limited generaliza-bility due to specific contexts or populations. Potential bias in online reviews.	Address the need for a comprehend-sive understand-ing of factors influencing patient satisfaction in the context of e-consultation.	Liddy (2016), Hayati et al. (2020), Amporfro et al. (2021), Blödt et al. (2021), Qi et al. (2021)

E-consult online indicators	Physician reputation, online contributions, reviews	Signal quality and expertise to patients	Reliance on online indicators may overlook other aspects of a physician's competence. Dependence on subjective online reviews.	Explore the limitations of relying solely on online indicators and address the need for a more holistic assessment of physicians in the e-consultation context.	Yu et al. (2020), Li et al. (2019), Hong et al. (2019), Shah et al. (2021), Shah et al. (2022), Greenwood et al. (2019), Yang et al. (2018), Ouyang et al. (2022)
Doctor-Patient Attitudes	Trust, shared decision-making, professional expertise	Traditional model emphasized paternalistic approach, newer model emphasizes patient involvement	Studies may be influenced by cultural variations in doctor-patient relationships. Limited exploration of specific cultural contexts.	Examine cultural nuances in doctor-patient attitudes and their impact on the adoption and success of e-consultation.	Kurasz et al. (2022), Shah et al. (2021), Karatas et al. (2022), Schein & Peter (2021), Waller et al. (2020)

Trust in E-consult-ation	Interpersonal trust, risk, reliance on expertise	Crucial for the adoption of e-consultation services	Limited exploration of specific types of risks and how they impact trust. Variability in the definition and measurement of trust.	Investigate specific types of risks influencing trust in e-consultation and work towards a standardized understanding and measurement of trust in the context of healthcare services delivery through e-consultation.	Newman & Ford (2021), Levine et al. (2020), Wolfensberger (2019), Calnan (2020), Lemmers & van der Voort (2021), GMC (2022), Falcone et al. (2020), Zhao et al. (2021), Vashu et al. (2022)

Source: Authors Construct, 2023

2.27 Conceptual Framework

A conceptual framework is a structure which the researcher believes can best explain the natural progression of the phenomenon to be studied (Mensah, Agyemang, Acquah, Babah, & Dontoh, 2020). It is linked to the researcher's conceptions, empirical study, and essential theories for advancing and systemizing his or her expertise. It is the researcher's description of how the research problem will be investigated. From a statistical perspective, the conceptual framework describes the relationship between the main concepts of a study. It is arranged in a logical structure to aid provide a picture or visual display of how ideas in a study relate to one another. Conceptual frameworks can be 'graphical or in a narrative form showing the key variables or constructs to be studied and the presumed relationships between these key constructs (Van der Waldt, 2020).

This study believes that to implement a successful e-consultation, the researcher identifies a model that bridges the models of Delone & Mclean IS success and the diffusion of innovation to form a suitable model for the successful implementation of e-consultation in Ghana. The study presents the relationship as shown in figure 7.

The framework adopted e-consultation system implementation from the Delone & Mclean IS success model which has components such as information quality, system quality, and service quality. A study done by Ruth et al (2019) identified a significant effect between the system quality on user satisfaction, service quality on use, service quality on user satisfaction and user satisfaction on net benefits. The measurement of behavioural use (perception) is also a way to measure the acceptance of new technology (Talukder, Chiong, Bao, & Malik, 2018). Customer satisfaction is closely related to service quality since "Satisfaction (or dissatisfaction) results from experiencing a service quality encounter and comparing that encounter with what was expected" (Oliver, 1980). Generally, complete satisfaction is a subjective phenomenon as well as feelings triggered by the perceived difference between expectations and service quality.
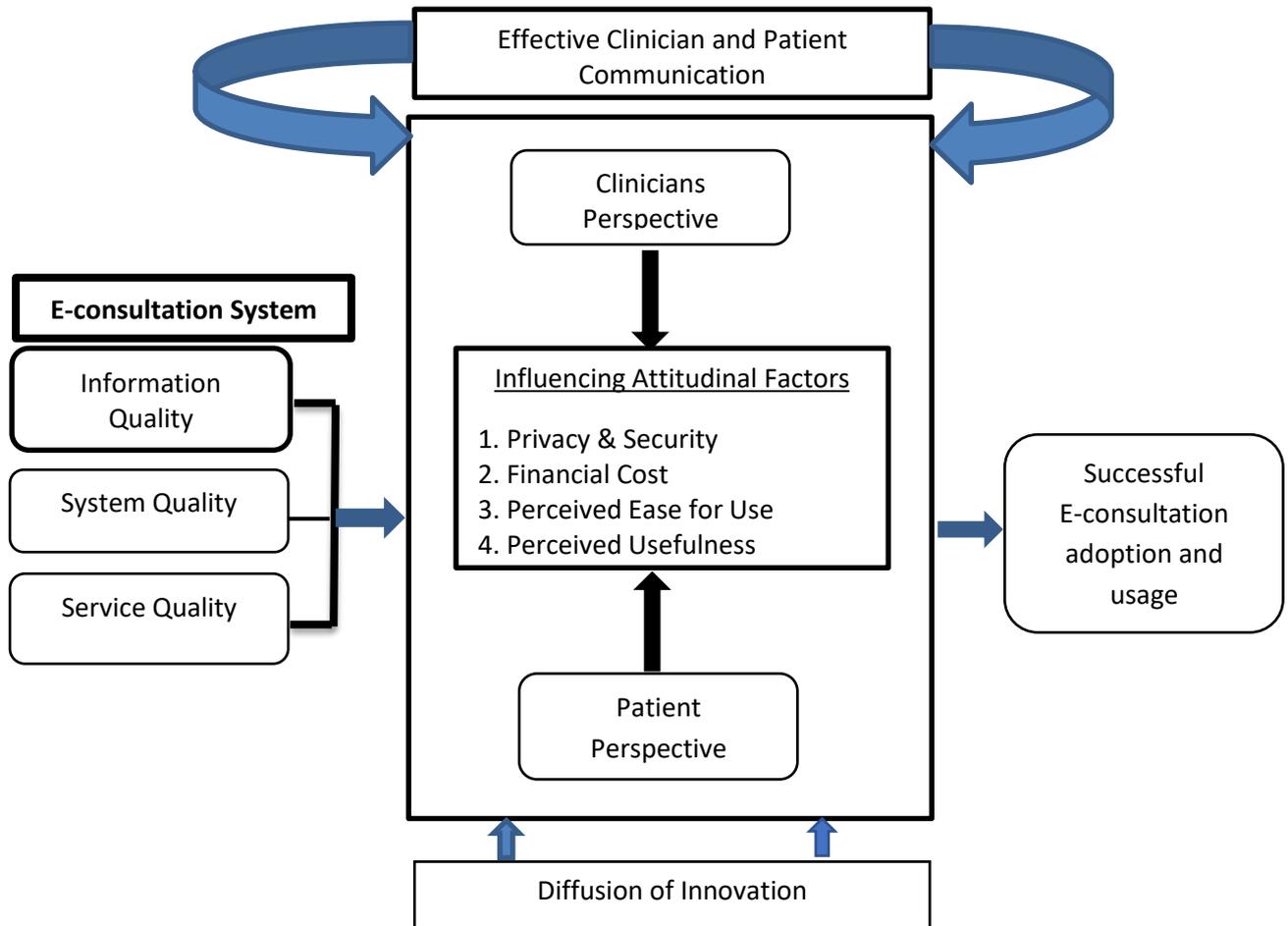
Figure 7: Conceptual Framework   Source: Authors Construct (2022)

Generally, computing systems are susceptible to security and privacy breaches which negatively impinge on their adoption and usage in the health sector. This is because users of e-consultation want to be sure that the use of technology in healthcare will not result in unauthorized disclosure of information. The security of patient information is one of the key ethical values in the medical field. Data privacy, confidentiality and security concerns have been mentioned as among the factors influencing the adoption of e-consultation in Ghana (Kesse-Tachi, Asmah, & Agbozo, 2019). The implication here is that the security of e-consultation data is of paramount importance if e-consultation is to gain confidence among

healthcare stakeholders. The stakeholders expect that the privacy of the e-health data should be on par with that of paper record systems. The change to electronic platforms brings up some issues with the privacy and security of patient data. Privacy and security are probably the most discussed issues within information Systems ethics (Schöpfel, Azeroual, & De Castro, 2022). Therefore, in order to appreciate the full prospect of e-consult, patients and providers must trust that the information being transmitted is confidential and protected. Thus, when it comes to e-consultation, Information Quality, System Quality and service quality remain major concerns in the broader use of e-consultation by medical staff and the general public.

When it comes to e-consultation, the attitudes of both medical staff and patients count a lot. The doctor-patient relationship is one of the most complex interpersonal relationships in healthcare. E-consultation systems can either improve or abate the relationship between the doctor and the patient. In addition, doctors are also concerned about the possibility of e-consultation tools in altering their relationship with patients. According to Rodger et al. (2019), there is overwhelming evidence of doctors' concern regarding the strained relationship with patients owing to e-consultation usage. Some doctors have disapproved of the use of e-consultation tools because they have a negative impact on the doctor-patient relationship. E-consultation tools have the possibility of shifting control of medical information. The impact of e-consultation use for health information has become a means of altering patients' roles. In many cases, e-consult tools empower patients to have autonomy over their healthcare (Nittari, Savva, Tomassoni, Tayebati, & Amenta, 2022). Some doctors may feel challenged when patients bring information to consultations. As a result, some doctors have become unhappy about the application of technology such as telemedicine.

When it comes to the financial aspect of e-consultation, most hospitals operate within a budget constraint because there is underfunding. As a result, hospitals are supposed to function with a limited IT budget. First-world countries have the financial means to invest heavily in research to develop information systems that match the needs of their healthcare system (Almacen & Cabaluna, 2021). This shows that greater health-care financing is highly linked to e-consultation adoption (Maheu & Atanda, 2022), even in rich nations, and that this should be the case in underdeveloped countries as well. Owing to low funding of the health sector by the government in third-world countries, it is difficult to allocate much money for the acquisition of ICT resources needed in the health sector (Almathami, Win, & Vlahu-Gjorgievska, 2020; Ramalingam, 2022). In terms of efficiency, the time has been interpreted as the speed of delivery (Sundström & Tollmar, 2018) and waiting time in the context of the Internet and electronic usage, both of which have been found to have significant impacts on overall perception.

Perceived usefulness on the other hand can influence the attitude of medical staff and the public positively to adopt and use e-consultation (Qi, Cui, Li, & Han, 2021). Clinicians' and patients' perspective on e-consultation has much to do with attitudinal factors which influences their behaviour towards this novel technology. As a result, the successful adoption and usage of e-consultation are cardinally influenced by the attitudes and perceptions of both clinicians and patients.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Overview

First, this chapter presents an argument from the philosophical standpoint of the research study regarding the adopted methodology, which formed the basis for data collection to address the research questions. A comprehensive discussion on the research design and methodology employed for gathering the necessary data is provided. The research design features a sequential application of both qualitative and quantitative approaches to the research methodology. This chapter offers a thorough analysis of the qualitative data collection method adopted and also sheds light on the quantitative method used for sequential exploratory studies. Lastly, it provides a synthesis to demonstrate how the data were processed and analyzed.

3.1 Research philosophy

Research philosophy is a crucial part of research methodology (Kanholkar & Dharkar, 2022). These philosophical approaches enable researchers to determine which methodology should be adopted and why (Bell, Bryman, & Harley, 2022). According to Saunders et al. (2016, p. 124), "The term research philosophy refers to a system of beliefs and assumptions about the development of knowledge." In research philosophy, the researcher interprets their view of the world, stating the essential assumptions. These assumptions will identify the research strategy and the methods of that strategy (Wambugu & Njoroge, 2022). Siddiqui (2019) cited Kuhn and defined a paradigm as an integrated cluster of substantive concepts, variables, and problems, along with corresponding methodological approaches and tools. Ontological and epistemological characteristics concern what is generally referred to as a person's worldview, which significantly influences the perceived relative importance of aspects of reality (Saunders, 2012). Axiology, on the other hand, is the researcher's view of the role of values in

research (ibid). Some researchers differentiate between positivist, post-positivist, and postmodernist inquiry, grouping postmodernism and post-structuralism within 'critical theory' built on the belief that research paradigms inherently reflect our beliefs about the world we live in and want to live in (Clandinin, 2019; Tamminen & Poucher, 2020). These substantive concepts provide the philosophical underpinnings that guide the choice of methodology, comprising ontology, epistemology, axiology, and pragmatism in this research study. This study is based on pragmatism. Bougie et al. (2020, p.24) point out that "Pragmatists do not take a particular position on what makes good research. They feel that research on both objective, observable phenomena and subjective meanings can produce useful knowledge, depending on the problem that initiated the study." Moreover, pragmatism is described as research being a process where the concepts and meanings (theory) are generalizations of past actions and experiences and of interactions that people have with the environment. By adopting pragmatism, the researcher typically explains what is happening through various ideas.

3.1.1 Ontology

An ontology is a formal explicit specification of a shared conceptualization for a domain of interest (Beretta, 2021). This definition is based on formal logic and allows for logic-based reasoning; it represents knowledge by the means of an explicit specification and allows for a shared conceptualization of a domain of interest for a common and harmonized representation of knowledge (Gabriela, Roldán-Molina, Ruano-Ordás, Basto-Fernandes, & José, 2021). Traditionally connected to philosophy, the term ontology has been increasingly related to information systems areas. In these two academic communities, some researchers consider the approaches completely different: while in the former there is speculation about the structures of the world, the latter is focused on concrete problems of modelling domains of knowledge in

computational artefacts (Roldán-Molina, Ruano-Ordás, Basto-Fernandes, & Méndez, 2021).

Ontology is the philosophical study of reality which suggests that ontologies are made and thus

something that can be 'discovered' by empirical research (Sadullaev, 2020). More specifically,

ontology addresses the following questions: What is the form and nature of reality, and what

can be known about that reality (Davies & Gregersen, 2014; Glattfelder, 2019)? In the context

of information systems/technology, it is the philosophical study of the nature of information,

systems of information, and the technology of information. The researcher, from an ontological

standpoint, thinks about issues such as whether the world exists independently of any

perceptions. Observers are better able to uncover the complex interactions and the dominant

processes that shape changes in the system (Schad, 2018). The main aim of this research is to

assess the implementation of e-consultation in the Ghanaian health sector. This will be

determined by the perceptions of individuals working in selected hospitals and patients who

patronize the services of these hospitals. This perception, recognized as intangible and

unconsciously held, would arise as a result of one's experience with e-consultation. A

qualitative approach encouraging participants to describe their experiences would need to be

followed by a thematic method of analyzing those descriptions to determine the participants'

perceptions.

3.1.2 Epistemology

Modern and contemporary accounts of epistemology tend to focus on limited questions of

knowledge and scepticism, such as how we can know the external world (Sosa, 2022). In

research, implicit epistemic statements are made about knowledge of concepts, acts (such as

representation), entities, and systems. In so doing, knowledge is created, and the epistemic

stance dictates what kind of knowledge that is. Some common names of epistemic stances are

pragmatic, positivistic, operationalist, referential, instrumental, empiricist, rationalist, realist, etc. Each of these makes claims as to what kind of knowledge can be created through research, how it is gathered, and how it is presented. Ancient philosophical theories of taste attempt to explain how people, as humans, can gain an understanding of the self and the world (Kaplan, 2019; Binmore, 2020). In different parts of its extensive history, different facets of epistemology have attracted attention. Plato's epistemology was an attempt to understand what it was to know, and how knowledge (unlike mere true opinion) is good for the knower (Moss, 2019). Kant's epistemology was an attempt to understand the conditions of the possibility of human understanding (Stänicke, Zachrisson, & Vetlesen, 2020), Locke's epistemology was an attempt to understand the operations of human understanding (Nde, 2022), and Russell's epistemology was an attempt to understand how modern science could be justified by appeal to sensory experience (Duncan, 2021). A researcher's ontological position links to their epistemological perspective – with the ontological perspective of the world and the epistemological perspective about knowledge of that world. The researcher's ontological standpoint of e-consultation being a human creation, created through the relationship between the experience of e-consultation and the "experiencer" of e-consultation, supports an epistemological position of using e-consultation through subjective, interpretive sense-making and meaning. This view, therefore, has an impact both upon the way the researcher decides to obtain data about the usage of e-consultation perceptions and how the data will be analyzed in the context of both how knowledge on e-consultation is brought about and how new knowledge from the research is created (Dash & Sahoo, 2021; Qi, Cui, Li, & Han, 2021).

3.1.3 Axiology
Axiology is the philosophical study of value. It encompasses questions about the nature and classification of values and about what kinds of things have value (Faucher, 2018). The term

is not widely used in the IS discourse, but the topics it covers are of crucial importance. Axiological theories that exist within different philosophical and cultural philosophies represent a diversity of opinions, conclusions, decisions, and methodological approaches (Kotlyarova, Roudenko, Shubina, & Shestakov, 2015; Shan, 2022). If value is what makes something desirable, then an understanding of axiology is important for any type of IS research. For example, maximizing profits, if this is what an organization does, expresses a specific set of values that need to be understood for the organization's actions to be plausible. In the field of IS, some aspects of axiology are well covered, notably ethics, whereas others are less prominent (Hassan, 2018). The emergence of the term 'axiology' thus represents an attempt to bring together and critically examine a wide variety of already existing and overlapping questions related to the essence of goodness, right conduct, value, and obligation (Biedenbach, 2016; Ramirez, 2022). In other words, axiology addresses questions related to what is valued and considered to be desirable or 'good' for humans and society. In this study, some of these ideas and concepts are applied to the research domain.

3.1.4 Pragmatism

Pragmatism is a philosophical tradition that considers words and thought as tools and instruments for prediction, problem-solving, and action, and rejects the idea that the function of thought is to describe, represent, or mirror reality (Effendi, 2020). In other words, pragmatism is a philosophical position that considers values as having no prior existence; they are created by a process of successful experimentation and emerge as problems are solved. For pragmatists, reality is true as far as it helps us establish satisfactory relations with other parts of our experiences (Kaushik & Walsh, 2019). Truth is whatever proves itself good or has stood the scrutiny of individuals' use over time.

Pragmatism also rejects the idea that researchers must choose their position between a pair of extremes of either locating their research and research findings in a completely specific context (constructivism) or designing their research with a generalized set of principles (positivist). Instead of focusing on the issue of context or generality, pragmatism places the central focus on the idea of enhancing transferability based both on the strength of the relation between cause and effect in quantitative data and on the trustworthiness and reliability of the qualitative data (Tuval-Mashiach, 2021). In other words, rather than trying to make the research results either context-bound or generalizable, pragmatism is based on the belief that theories can be both contextual and generalizable, aiming to investigate the factors that 'affect whether the knowledge we gain can be transferred to other settings' (ibid). Pragmatism breaks the boundary between positivism and constructivism and creates a connection between them when looking for what is meaningful from both (Morgan, 2022).

Pragmatism is also underpinned by quantitative methodology to explain social phenomena by generating testable numeric data from observation (Idha, et al., 2022). Quantitative methodology enables data to be collected about an observable social reality and facilitates the identification of trends, irregularities, and causal associations among variables, enabling the generalization of the research findings (Levitt, 2021).

Table 3: Pragmatism stance on ontology, epistemology and axiology

Philosophy	Pragmatism
Ontology	Multiple views are chosen to best enable answering of research questions
Epistemology	Focus on practical research, integrating different perspectives to help interpret data
Axiology	Values play a large role in interpreting results, the researcher adopts both objective and subjective views
Data Collection Technique	Mixed or multiple method designs, quantitative and qualitative

Source: Author's construct, 2022

3.1.4.1 How Pragmatism Underlines this Study

This study is an exploratory sequential design. It began with qualitative data collection. The findings from the qualitative study informed the quantitative data collection and analysis. Connecting, comparing, and contrasting the inferences that emerged from both quantitative and qualitative findings in this study, on the one hand, helped to develop and extend the understanding of e-consultation implementation in Ghana more richly than a study using only a single approach. This paved the way for more feasible and practical solutions to answer the research questions. In a sequential exploratory design, the priority, or the weight and attention throughout the data collection and analysis, can be given to either a quantitative or qualitative approach, and this may depend on the researchers' interest, the study's audience, and what researchers aim to focus on in their study (Mavodza, 2022). In this study, priority was given to qualitative data collection and analysis. Nonetheless, the quantitative approach was designed

to allow the researcher to develop a general understanding of the issues at stake and to develop a model that helps promote the adoption and usage of e-consultation.

3.2 Research Methods in Information Systems

The question of which research methods are most appropriate for information systems research has been a focus of concern for some time. In the same context, the concern over the high rate of information systems project implementation failures also continues (Figueroa-Flores, Acosta-Gonzaga, & Ruiz-Ledesma, 2020). Some researchers are of the opinion that the origin of information systems is embedded in a variety of reference disciplines with separate theoretical research perspectives on the important issues to study and the methods to study them (Brendel, Diederich, & Niederman, 2021; Hassan, Mathiassen, & Lowry, 2019). The world of information and communication technology is a fast-changing domain, which requires researchers to stay ahead with approaches that provide solutions to complex problems that inevitably present themselves (Singh, 2022). A combination of theory-grounded research questions with appropriate methodology should provide an acceptable level of results for both MIS and behavioral science researchers. Their argument implies that no single approach to information systems research can provide the richness that information systems, as a discipline, need for further advancement (Skinner, Nelson, & Chin, 2022). As advocates of mixed-method research have argued, the intricacy of human phenomena calls for more composite research designs to capture them. The mixed research perspective provides means of rising above false dualities (Siraj-Blatchford, 2020). Several research studies in the information domain have used mixed methods, including but not limited to (Koivisto & Hamari, 2019; Alasmari & Zhang, 2019). Generally, the motivation to mix methods in research is the belief that the quality of a study can be improved. Therefore, in this study, a combination of approaches (mixed methodology) will be more appropriate.

3.3 Research Methodology

Research methods are used to reveal the existence of, identify the 'value', significance or extent of, or represent semantic relationships between one or more concepts identified in a model from which statements can be made (Mishra & Alok, 2022). There are three alternative approaches used in academic research, which are all applicable to IS research (Bell, Bryman, & Harley, 2022). They are qualitative, quantitative, and mixed (combination of qualitative and quantitative) methods. Working from the positivist or pragmatic paradigms, qualitative research is about immersing oneself in a scene and trying to make sense of it – whether at a company meeting, at a community festival, or during an interview (Tracy, 2019). On the other hand, quantitative research with pragmatism as the current predominant philosophy is a type of research that explains phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics) (Amadi, 2021).

3.3.1 Research Approaches

The study employed a mixed-method research approach. The mixed methods use both qualitative and quantitative methods. With this approach, the strength of each other makes up for the weakness of the other. Quantitative research is empirical research where the data are in the form of numbers. Quantitative research is also referred to as data which can be expressed numerically or classified by some numerical value. However, everything cannot be measured quantitatively, and this sets boundaries for quantitative research. Questionnaires and mathematical models are some methods that are more suitable for quantitative research. Also, qualitative research is used to create a deeper understanding of a specific subject, specific event, or situation, and it is more suited for observations and interviews. Buchholtz (2019) argues that the case for combining multiple research approaches and providing practical guidance for researchers interested in using the mixed methods approach provides triangulation since both

quantitative and qualitative approaches complement the weakness of each other. A report by Tashakkori, Johnson, & Teddlie (2020) states that triangulation is the most common mixed-method design. There is a positivistic view underlying the assumption of triangulation, suggesting an objective reality in which there can be validation of a given truth.

In using the mixed method for this study, the qualitative approach allowed the researcher to identify issues pertaining to e-consultation implementation in Ghana. The quantitative approach additionally assisted in the interpretation/confirmation of the identified issues by collecting numerical data.

Depending on the research domain and aim/questions, the mixed research methods can be operationalized in three different designs: sequential; conversion; and multilevel. Sequential mixed designs are used in studies in which one phase occurs after the other, i.e., QUAL to QUAN, also known as exploratory sequential, or QUAN to QUAL (explanatory sequential). The exploratory sequential design interprets how quantitative results build on initial qualitative results (Dawadi, 2021).

The advent of COVID-19 necessitated the use of e-consultation in the developing world; however, the system is hit by a myriad of challenges in its implementation, particularly in Ghana, making this study very important. This necessitates the need for a carefully designed research methodology. In this regard, it was realized upon reviewing relevant literature that both qualitative and quantitative approaches applied sequentially could provide the necessary data to help identify the key determinants. In agreement with Bell, Bryman, & Harley (2022), mixed methods research integrates qualitative and quantitative methods in one study to improve the study's quality. The use of the mixed-method approach will help improve the quality of this research study by providing richer data for a better understanding of issues

pertaining to healthcare delivery and the foreseeable role of e-consultation in the context of social, moral and ethical values.

3.4 Research Design

This study is based on an exploratory sequential approach by using the multiple-case study method. A case study is one of the most used qualitative research methods in technology management and information systems studies (Shahar, Ma'arif, Yusof, & Mohd Satar, 2019). It is recommended over other methods to investigate a phenomenon when research and theory are at their early, formative stages, and sticky, practice-based problems where the experiences of the actors are important and the context of action is critical (Aidonopoulou-Read, 2020). An exploratory sequential research approach is useful in research areas relatively unexplored, such as medical e-consultation, where there has been very little empirical evidence (Metallo, Agrifoglio, Schiavone, & Mueller, 2018). The study used surveys and interviews. Data were collected from hospitals and patients within a selected geographical region in Ghana. Having studied these various cases helped the researcher to compare and contrast the outcomes of the cases to draw logical conclusions. Figure 8 provides a pictorial view of the research as follows:
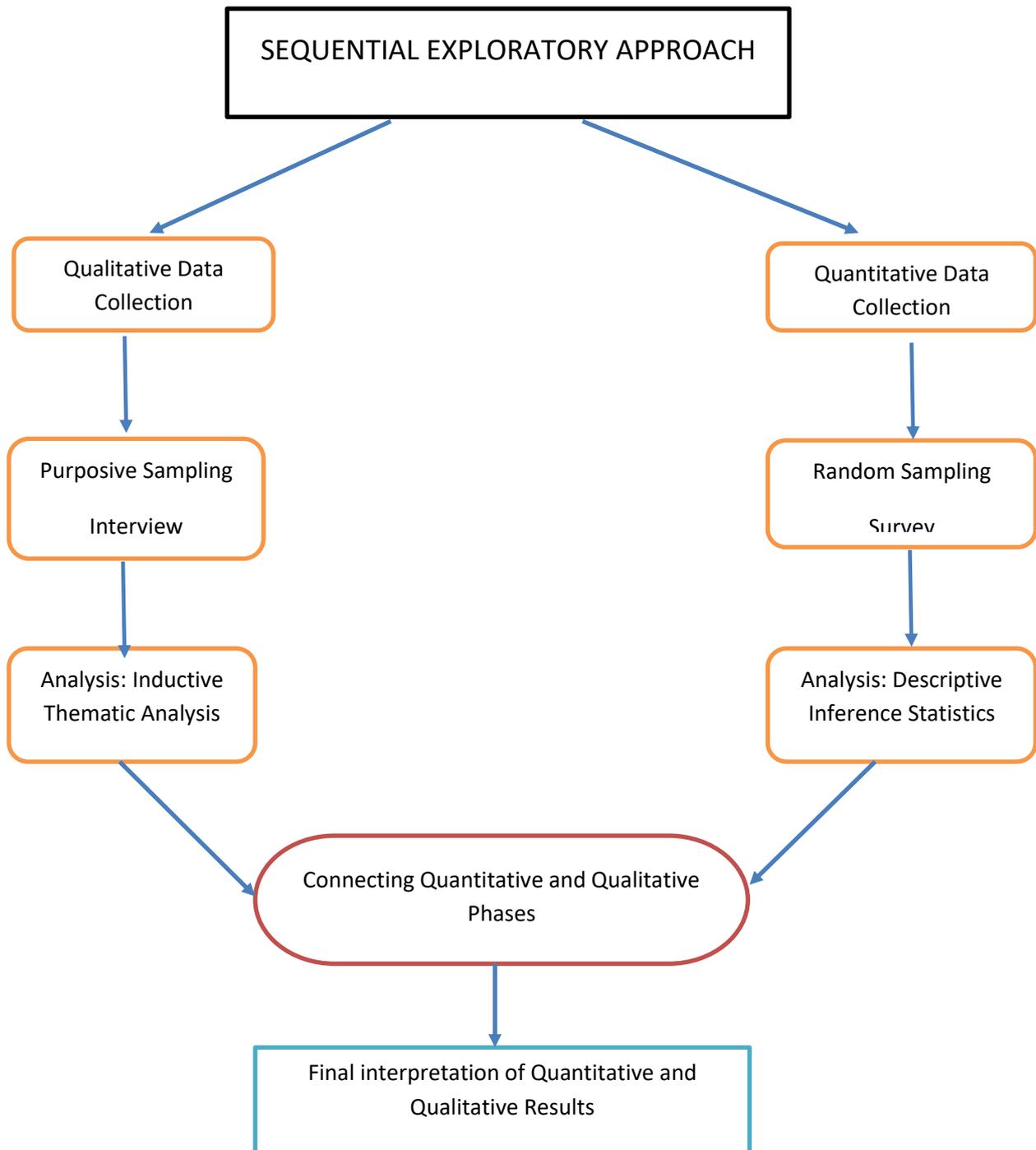
Figure 8: Sequential Exploratory Approach diagram

Source: Authors construct, 2022

3.5 Identification of Literature review

To advance researchers' cumulative understanding, scholars are obliged to recognize what has been done previously, the strengths and weaknesses of existing studies, and what they could mean. In general, the review seeks to identify and understand all potentially relevant research traditions that have implications for the studied topic and to synthesize these using meta-narratives instead of by measuring effect size (Taatila, 2022). To gain an understanding of what has been done and what will be worth doing for the purpose of this study, selected keywords relevant to e-consultation were combined to identify previous studies. With reference to the proposed procedures for conducting a systematic literature review by Okoli (2015), the literature research and review were carried out. A thorough, high-level literature review is the foundation and inspiration for substantial, useful research. A literature review goes beyond the search for information and includes the identification and articulation of relationships between the literature and the field of research. This literature review had the following goals:

➢ Identify the purpose:

➢ Draft protocol

➢ Apply practical screen

➢ Search for literature

➢ Extract data

➢ Appraise quality

➢ Synthesize studies

➢ Write the review

Articles indexed in Scopus, Google Scholar, PubMed, Web of Science, ProQuest, and Science Direct were searched. With these databases known for the publication of telemedicine-related work, all fields provided were searched. The following search phrases were applied in all databases: "e-consult," "e-consultation," "online doctor," "electronic consultation," "e-Prescription," and "online consultations." A PRISMA flow chart diagram (see Figure 3.2) illustrates the article selection process.

3.5.1 Selection criteria

The abstracts of selected articles were reviewed for relevance and inclusion. The following inclusion criteria were used.

Table 4: Abstract Selection Criteria

E-consultation system/facility	Primary, secondary, tertiary, rural, urban, public and private healthcare facilities, and homes.
Study type	Empirical and reviewed studies focusing on all types of e-consultation system adoption and usage in a medical context
Region	Africa, Europe, North & South America, Australia, Antarctica and Asia.
Economic category	Developed and developing countries
Exclusions criteria	
Articles not written in English. Studies (empirical and conceptual) which did not focus on e-consultation in the context of medicine or were not central to the research objectives.	

Source: Authors construct, 2022

3.5.2 Data Synthesis

Data synthesis involves organizing and summarizing the results of the included studies. Synthesis can be descriptive (non-quantitative) (Qais Albtoosh, 2022). Well-conducted evidence synthesis typically involves a complex set of steps, therefore following a cohesive,

step-by-step guide on how to conduct a systemic review and meta-analysis was essential (Muka, et al., 2020). The themes that emerged in the process of the data synthesis were thematically analysed. The definition and explanation of the terminologies given in the articles were studied again throughout the themes to ensure consistency and independence. See figure 9, the Prisma flow diagram showing the articles selection process:
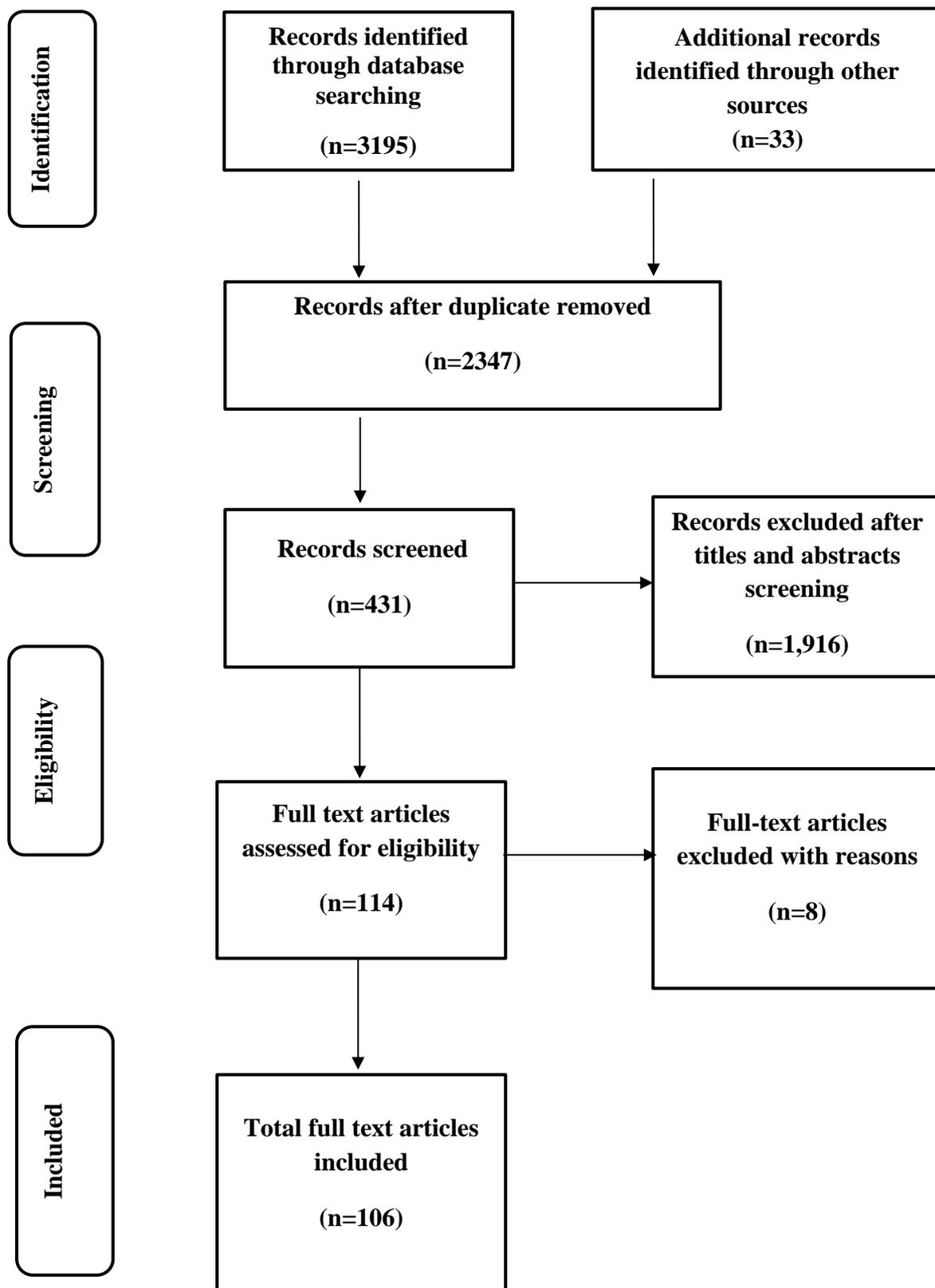
Figure 9: Prisma flow diagram showing the articles selection process   Source: Author (2022)

3.6 Qualitative method

Qualitative research involves the collection and analysis of narratives and/or open-ended observations through methodologies such as interviews, focus groups, or ethnographies to understand and explain social phenomena (Ahmad, et al., 2019). The idea of electronic healthcare is relatively new in Ghana, as in other developing countries, and its use has not yet been part of mainstream healthcare delivery. This makes it imperative to understand the key determinants of its adoption readiness, which could only be achieved by in-depth exploratory interviews with relevant stakeholders. This was in accordance with the goal of qualitative research, which was to understand issues or particular situations by investigating the perspectives and behavior of the people in these situations and the context within which they act (Döringer, 2021). Thus, preserving the chronological flow, documenting what events lead to what consequences, and explaining why this chronology may have occurred (Tracy, 2019) in relation to reasons, high IS project failures are experienced. There has been a general shift in IS research away from technological to managerial and organizational issues, hence an increasing interest in the application of qualitative research methods. The literature reviewed found that the successful adoption of e-Health in both developed and developing countries comes with proper attention paid to the technological (Yusif, Hafeez-Baig, & Soar, 2020; Al-Radaideh & Alazzam, 2020), managerial and organizational readiness (Biancone, Secinaro, Marseglia, & Calandra, 2021).

There are different approaches to qualitative data collection. Popular among these approaches are interviews, and participant and non-participant observation (Busetto, Wick, & Gumbinger, 2020). In a research study where the opinions and experiences of participants about a

phenomenon are critical, such as this, observation could not be applied given the fact that the nature of this study does not provide any room for it. As reported by Hitchings & Latham, (2020), interviewing is the most widely used method in qualitative studies. Compared with observation, it is more economical in terms of time, so as a result, interviewing as a means of inquiry was chosen. Interviewing is trying to understand what people think through their speech. Interviews remain the most common method of data collection in qualitative research and are believed to provide a 'deeper' understanding of social phenomena than observations. In situations where little is known about a subject (as in this research study), interviews were deemed most appropriate (Doyle, McCabe, Keogh, Brady, & McCann, 2020).

Richards (2020) is of the view that the best way to gather information is to ask the relevant people directly, rather than using other forms of secondary data. In asking the relevant people, however, it is important to commence with a pilot test (Yusif, Hafeez-Baig, & Soar, 2020). Therefore, the interview guide was first emailed to some prospective participants a week before the data collection/interviews sessions. This allowed the researcher to establish if the guide was clear, understandable, and capable of answering the research questions and whether any changes to the interview schedule were required. Follow-up emails and telephone calls were made to participants to seek any necessary discussion/clarifications on the interview guide sent earlier to them.

Notwithstanding, qualitative methods may be combined with quantitative methods in conducting a study (Natow, 2020). As such, the findings/themes generated from the analysis of the qualitative data collected served as input for the development of an instrument for the collection of quantitative data.

3.6.1 Interviews

The most common methods used in healthcare-related research, however, are interviews and focus groups. Focus groups, on the other hand, are used for generating information on collective views, and the meanings that lie behind those views (Nyumba, Wilson, Derrick, & Mukherjee, 2018). On the one hand, in-depth interviewing is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program or situation (Hitchings & Latham, 2020). Both in-depth interviews and focus group methods for collecting qualitative data share the same objective of gathering information-rich data. Swedberg (2020), exploratory research generally provides information and insight to researchers as they prepare for larger research efforts, such as surveys and experiments, and they can gain greater insight into their study.

The choice between in-depth interviews and focus groups became difficult due to their similarities. As a result, several factors were considered. Noticeable among these were the research domain and characteristics of the sample population. The entire healthcare environment in Ghana is a busy one for all employees. This characteristic made it difficult to conduct focus group sessions. Again, given that e-consultation research in Ghana is still in its infancy, this implies that little is already known and very few individuals may be knowledgeable enough to provide the necessary information, which made in-depth interviews suitable for this research study.

The in-depth or unstructured interview is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation (Ruslin, Mashuri, Rasak, Alhabsyi, &

Syam, 2022). As with other larger research projects, in this study too, in-depth interviews were conducted at the beginning as an initial tool for the collection of quantitative data. This was done to provide context to other data and provide an opportunity for the researcher(s) to handpick a specific sample for rich data purposes.

3.6.1.1 Justification for in-depth interviews

As suggested by Schiavone, Mancini, Leone, & Lavorato (2021), interviews are most appropriate where little is already known about the study phenomenon or where detailed insights are required from individual participants. The purpose of in-depth interviewing is not to get answers to questions, nor to test or evaluate hypotheses, but to understand the lived experience of other people, which cannot be identical from one person to the next, and the meaning they make of that experience (Roberts, 2020). Hence, in this research study, interviews were used to explore the views, experiences, beliefs, and motivations of individual respondents on e-consultation. Furthermore, the difficulty of sampling the population of doctors and paramedics who, at the best of times, are busy and can only afford to participate in research when the time is appropriate for them in the context of their work, motivated the adoption of the in-depth interview technique.

The primary advantage of in-depth interviews is that they provide much more detailed information than is available through other data collection methods and in a more relaxed atmosphere (Ahmad, et al., 2019). In-depth interviews are a particularly good choice for getting qualitative data in cases where it would be logistically difficult to gather all relevant participants into one room at the same time (Creswell & Creswell, 2017; Matyas, 2020) as was the case in this research. In-depth interviews are also useful when a researcher wants to collect detailed information about a person's thoughts and behaviors or wants to explore new issues in

depth. Interviews are often used to provide context to other data (such as outcome data) and, in this case, build up to a quantitative data source later in the research process. In consonance with Roberts (2020), they are often used to refine questions for future surveys by a particular group. The following table summarizes the advantages of in-depth interviews and their applicability to this study:

Table 5: Advantages of in-depth interviews and their implication for this study

Advantage	Applicability to this study
Provide additional context for understanding community activities and events (Monroe, et al., 2019)	Allowed the researcher to have an overview of issues of e-consultation adoption and usage in Ghana
Help to give individual perspectives about the study (Roberts, 2020)	Interviewees provided brief accounts of some issues they perceived to be sensitive and peculiar to them as individuals discussing their institutions, which helped in the analysis of the data for themes.
Researchers have the flexibility to add questions in real-time (Roberts, 2020)	The researcher followed up on some explanations with further questions
In-depth interviews help data quality: Skilled interviewers can react to queries and probe for information. (Rutakumwa, et al., 2020)	Interviewees provided an unlimited account on the implementation of e-consultation in Ghana

Advantage	Applicability to this study
Short timelines: Data can be collected faster than other research methods (Frasso, Keddem, & Golinkoff, 2018)	Individual interview appointments were easy to acquire at any time, allowing the researcher to collect data quickly because several interviews were conducted on the same day.
Aide Memoire has the potential to provide rich data	Allowed interviewees to express their views with no limitations
With no scales and respondents answering in their own words, the interview serves more like a moderator guide.	The interviewer adjusted the order and flow of the questions and asked additional questions as needed.
Suitable for non-generalizable data/sample	There are a limited number of e-consultation in Ghana. As such only a handful of individuals have been involved in its usage.
Possibility of making data analysis easier (Deterding & Waters, 2021)	During data analysis, the researcher reminisced on individual interview situations, which facilitated data analysis.

Source: Adapted from Robert (2020) and Wallace Foundation (2009)

Apart from the advantages tabulated in table 4, there were also some aspects of in-depth interviews that presented some challenges. In such circumstances, meticulous steps were

employed to minimise the potential effects of such challenges on the outcome of this research.

Notable examples are summarised in the table 5.

Table 6: Challenges of in-depth interviews

Challenge	Minimization intervention
Personal opinions were acquired from interviewees, and as a result, the data had the propensity to be biased.	The researcher maintained a neutral position throughout the interviews to ensure interviewees stay focused.
Appointments prone to cancellation	The researcher issued follow-up e-mails and phone calls to remind participants and confirm availability for the scheduled times
Data gathered could not be generalized	Qualitative data was analysed to develop an instrument for survey administration (Quantitative data collection and analysis)
Interviewing necessitates a high level of expertise and training.	The researcher had undertaken earlier research scoping interviews with most of the interviewees so gained some experience
Analysis can be challenging, time-consuming	Organization of data into tables containing questions and answers provided by various interviewees

Challenge	Minimization intervention
The tendency of interviewees to explore unrelated issues	The researcher will intervene from time to time with key questions that bring interviewees back on track.

Source: Adapted from Scalan (2020)

The themes that emerged from the analysis were used as a starting point for the construction of survey questions for the next stage of the research process, which would collect quantitative data. The qualitative data gathered and analyzed in this phase influenced the outcome of the quantitative data that was gathered in the subsequent and final phase of data collection. As per the objectives of this study, which informed the choice of an exploratory sequential method, the main aim of collecting qualitative data was to complement the latter stage, quantitative data collection, and not compete with the quantitative data in any context. Against this backdrop, the qualitative data collected contributed to this study in the following capacities:

a) Provided a base to confirm and reject the findings of previous related studies in other developing countries regarding the myth surrounding the use of technology in the healthcare sector;

b) Provided first-hand information on the views of doctors, IT managers, nurses, and pharmacists in health facilities in Ghana;

c) Provided data, which after analysis, has the potential to indicate means of redressing some of the increasing issues that are capable of undermining efforts to improve e-consultation adoption and usage by hospitals in Ghana;

d) Added fresh data to the already existing limited data on the implementation of e-consultation in the Ghanaian Health Sector;

3.7 Quantitative method

Quantitative research is defined as social research that employs empirical methods and empirical statements and the application of empirical evaluations (Cohen, Manion, & Morrison, 2013). Quantitative research is useful for quantifying opinions, attitudes, and behaviors, and other defined variables and generalizing results from a larger sample population by generating numerical data (Mohajan, 2021). This can be done by first seeking the opinions of a small selected group to gain rich information and generalizing/confirming such information numerically. Similarly, in this research, qualitative data was first collected through one-on-one interviews with key selected medical professionals involved in e-consultation usage in Ghana. A quantitative research approach can be administered through surveys, correlation, experiments, and causal-comparative methods. Quantitative research uses a formal, objective, systematic process to describe variables, test relationships between them, and examine cause-and-effect associations (Bloomfield, 2019). At the core of quantitative data analysis were variables and the relationships that existed between them to provide more understanding of the outcome of the qualitative study on a large scale.

3.8 Target Population

In agreement with Sileyew (2019), the population of the study constitutes the group of persons or institutions that define the objects of the investigation. The population for this study encompassed all staff and patients of hospitals that utilize e-consultation in Ghana. This population was believed to have the required knowledge needed to participate in this research study because of their usage of e-consultation.

3.9 Sampling

3.9.1 Sample Size
Sampling is an important component of any piece of research for the purposes of gathering data concerning the population to make an analysis that can be generalized to the population concerned. Obtaining a sample size that is appropriate in all regards is critical for many reasons. Most importantly, a large sample size is more representative of the population, limiting the influence of outliers or extreme observations. According to Shooshtari, Jannejad, Razavipour, & Varnasseri (2017), for in-depth qualitative research studies, 20-30 in-depth interviews were considered necessary to uncover 90-95% of all issues under consideration for the purpose of generalization. Previous small-scale e-Health research studies used a similar sample (Afarikumah, 2014; Vroom, Godi, Dery, & Afagbedzi, 2017). The sample size comprised 50 health practitioners and 100 patients. Out of this, 10 health workers and 20 patients were chosen from each health facility under study. This number was informed by the limited number of people who use e-consultation in these facilities, as well as the limited number of patients who patronize these services compared to traditional methods of consultation.

For the qualitative studies, 12 participants with relevant experience participated in the face-to-face interview. Two persons were interviewed at each facility. It should be noted that for a developing country such as Ghana, and given that e-consultation is still in its infancy stages, not many experts could be obtained for the qualitative studies.

3.9.2 Sampling Technique
Creswell & Creswell (2017) stated that the decision in selecting participants, the strategy for the sampling, and the size of the study is termed sampling strategy or technique. Sampling is also defined as the selection of specific data sources from which data are collected to address a research objective (Sileyew, 2019) The application of their definition of sampling in this

study implies an act of careful selection of a reasonable representative population with attributes capable of determining the characteristics of the entire population relevant to this study. The two broad sampling techniques can be grouped under two broad headings: probability (random) and purposive (non-random). Probability sampling techniques are used most often in quantitative research to obtain a sample that most accurately represents the entire population (Bloomfield, 2019) .

Random sampling was used for the quantitative studies and purposive sampling was adopted for the qualitative phase of the study. Medical e-consultation is not well practised in Ghana, therefore for the qualitative study, a purposive sampling method was chosen since it enables the researcher to choose subjects who, in their opinion are relevant to the project (Alam, 2020). Purposive sampling is widely used in qualitative research for the identification and selection of information-rich cases that exhibit knowledge of or experience with phenomena of interest and for the most effective use of limited resources (Mohammadi, et al., 2021). A purposive sampling technique assumes that a researcher's knowledge about the population can be used to handpick the cases to be included in the sample. In addition to knowledge and experience, Arababadi, Leyer, Hansen, Arababadi, & Pignatta (2021) note the importance of availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner.

3.9.3 Recruiting sample

Recruitment of participants was one of the most challenging aspects of this research study because of the nature of the participants, their working environment, and their work schedules. Recruitment is the dialogue that takes place between an investigator and a potential participant

prior to the initiation of the consent process (Perrins, Ferdous, Hay, Harreveld, & Reid-Searl, 2021). The main goals for recruiting participants for this study were twofold: Firstly, to recruit a sample that adequately represents the target population; and secondly, to recruit sufficient participants to meet the anticipated sample size recommended for the collection of qualitative data through in-depth interviews. The recruitment exercise began with the identification, targeting, and enlistment of participants for this research study. It involved providing information to each potential participant and generating their interest in the proposed study (Parker, Scott, & Geddes, 2019).

3.9.4 Recruitment techniques

Successful participant recruitment was an important aspect of conducting this research study (Chillakuri, 2020). Researchers conducting qualitative studies in health-related fields encountered challenges in recruiting specific target populations. A visit was made to some hospitals under the Ghana Health Services and other private hospitals, both of which fall under the auspices of the Ministry of Health – Ghana. These hospitals were chosen because of their involvement in the implementation of e-consultation. After meeting the head of administration and senior officers at the Research and Ethics department of these facilities, I was directed to the heads of departments in the hospitals. The referrals served as the main strategy for recruiting relevant participants in this research study. This was because the main goal of purposive sampling was to focus on particular characteristics of a population of interest, which will best enable the researcher to answer the set research questions. The sample being studied was not representative of the population, but for research such as this, it serves as a platform for pursuing initial qualitative data for larger quantitative data in the latter stages. This is therefore not considered a weakness but a strength.

After meeting various interested participants, "advance notices" and a draft interview protocol were given to them. "Advance notice" is a known technique that is effective in enhancing response rates (Hiebl & Richter, 2018). In advance notice, the relevance of the research study was stressed.

3.10 Data Collection - Qualitative

3.10.1 Writing an In-depth Interview guide

An in-depth interview guide or aide-memoire is a list of relevant topics/questions used as a guide for an interview to ensure that all important questions are asked and not forgotten. It contains the questions/lists of topics to be covered during the interview. The interview guide probed the following areas of the study: the current state of e-consultation, motivation for e-consultation use, technology adoption, E-Health technology framework of the Ministry of Health, challenges faced by e-consultation usage, the future of e-consultation, and how to promote the use of e-consultation in Ghana. The specific objectives in mind at the time of writing the interview guide were to:

➢ Identify key concepts/themes, which could be used in assessing/measuring individually explored and newly identified factors where possible from key stakeholders based on their experiences from e-consultation usage.

➢ Use the outcome of the analyzed qualitative data (concepts/themes) to develop a survey instrument for quantitative data.

The In-depth interview guide further helped this study in investigating other related issues that arose during the interview – including the unexpected. Unlike moderator guides, in-depth interview guides have fewer components and did not include ground rules (Wallace, 2021).

The following components were applied during the development of the interview guide for this study:

a) The purpose and introduction: The introduction included the purpose of the interview, which was capable of convincing potential respondents to participate in the interview. This was followed by the introduction of the interviewer and the reason the research was being conducted. The topic was introduced in such a way that it did not reveal too many details about what the participants would be asked. It was, however, sufficiently informative to encourage them to agree to participate.

b) The questions, which make up the major part of the guide; and

c) The conclusion, which allows the interviewer (researcher) to end the interview by asking the respondents if they have any further comments about the topic.

3.10.2 Conducting the interviews

In conducting the interviews with the participants who agreed to participate in the research study, it was vital for the interview to be conducted in an environment in which the respondents felt most comfortable, for example, their workplaces (hospitals and working offices). In other words, data collection/interviews took place in the natural setting of the study (hospitals) because qualitative methods seek to describe, explore, and understand phenomena from the perspective of the individual participants (Doyle, McCabe, Keogh, Brady, & McCann, 2020). Participants who had their own offices opted to be interviewed in their offices, whereas those who shared offices used other unoccupied office spaces within their working premises. The researcher and participants made advance appointments as per the availability of the respondents in most cases. The researcher began the interview with a clear understanding of the participants in terms of backgrounds and the number of years working in their current

institutions. In conducting the interviews, the following process, as recommended by Boyce and Neale (2006), was adopted by the researcher as it laid the ground rules for good interview practice:

a) Set up interviews with stakeholders, explained the purpose of the interview, why the stakeholder had been chosen, and the expected duration of the interview;

b) Sought informed written consent from the interviewees. The researcher then re-explained the purpose of the interview, why the stakeholder had been chosen, the expected duration of the interview, the use of a note-taker and/or tape recorder;

c) After the interviewees consented, the researcher conducted the interviews, which were audio-recorded on an iPhone;

d) Summarized key data immediately following the interview; and

e) Verified information given in interviews whenever necessary.

3.10.3 Organizing the data

To organize the data, the researcher read through each interview guide. This was followed by the researcher immersing themselves in the data to comprehend its meaning in its entirety, an important first step in the analysis of qualitative data. Furthermore, the data were organized in a way that made it easy to peruse, allowing the researcher to go through each topic to pick out concepts and themes. In doing this, all transcribed data were organized into various categories using NVivo. NVivo is a computer-assisted qualitative analysis software that helps researchers to organize and analyze unstructured information by providing tools for classifying, sorting, and arranging data in ways that enable the identification of themes and patterns. The researcher gained a broad understanding of the themes in the data and was able to drill down into the material for deeper analysis. Taking a more thorough approach to thematic analysis, the

researcher read through each interview and 'coded' the emerging themes by selecting interesting comments and putting them into groups. In effect, this way of organizing the data allowed the researcher to look at the responses to each topic and specific questions.

3.10.4 Limitations of In-depth interviews
In-depth interviews, as with many other research methods/data collection instruments, demonstrate some limitations for qualitative data collection in this research study. Firstly, interviewees may have been prone to providing answers that reflected their feelings/understanding about e-consultation implementation (adoption and usage). To address this limitation, the researcher remained neutral throughout the interview sessions and always focused on the interview guide. Secondly, the interviews were time-intensive assessment activities because of the time it takes to conduct the interview, transcribe the audio recordings, and analyze the transcribed data, resulting in a more difficult analysis. Thirdly, given that there is no standard number of interviews, the length of each interview and the number of in-depth interviews the researcher completed for this research project was 12, which is not generalizable.

3.11 Data Collection - Quantitative

3.11.1 Data Collection Instrument
The main instrument used for data collection was a well-structured self-administered questionnaire developed on a five-point Likert scale, measuring from Strongly Disagree as response 1, to Strongly Agree as response 5, with all questions arranged in one direction. This instrument was used for the quantitative study due to its numerous advantages, which include being economical, assuring anonymity, no pressure for immediate response, and time limitations, and partly because this research dealt with elite respondents. There were two different questionnaires developed and administered: one for clinicians and the other for patients. For clinicians, the questionnaire was categorized into six areas as follows:

a) Demography

b) Knowledge, Skills, Performance

c) Safety and Quality

d) Communication, Partnership and Team Work

e) Managing Trust and

f) Challenges

The second questionnaire meant for patients was divided into four areas as follows:

a) Demography

b) E-consultation Usage

c) Challenges

d) Views on Promoting e-consultation

3.12 Analysis of Data

3.12.1 Qualitative data analysis

Qualitative research is a generic term that refers to a group of methods and ways of collecting and analyzing data that are interpretative, exploratory, or explanatory in nature and focus on meaning (Busetto, Wick, & Gumbinger, 2020). In this research study, justification was provided in support of the choice of in-depth interviews, including the topic under study and the research settings. Furthermore, given that the theme was induced/identified from the analysis of initial qualitative data, thematic analysis emerged as the favored method of analysis. As such, themes were the main outcome of the thematic analysis. The nature of this study does not enforce the recurrence of ideas to be coded or themed. They have to be present, however, they could be induced if necessary since the literature reviewed identified certain common/regular themes/variables.

Notwithstanding the diversity of qualitative methods, the following outlined process of analysis was based on a common set of recommended principles:

a) Transcribing the audio-recorded interviews;

b) Organizing the data and immersing oneself within the data to gain detailed insights into the experiences/perceptions of doctors, paramedics, and IT managers being explored;

c) Finding and organizing ideas and concepts thereby developing a data coding system;

d) Linking codes or units of data to form overarching themes/concepts;

e) Ensuring reliability and validity in data analysis; and

f) Finding possible and plausible explanations of the findings to communicate findings and their implications

3.12.2 Quantitative Data preparation and entry

Data preparation commenced once the questionnaire was developed. The questionnaire for the collection of quantitative data for this research study was designed to allow well-organized data to be collected and easily entered. The questionnaire was peer-reviewed by relevant stakeholders – individuals and groups with pertinent knowledge in both industry and academia, taking into consideration the appropriate method of analysis to be used out of the myriad of quantitative data methods available.

The questionnaire for data collection was paper-based. As such, during the entry of answers, particular attention was paid to multiple answers provided for one question and related errors. The data were meticulously entered into an MS Excel spreadsheet with an entry of relevant variables. The data in the Excel file were later exported to IBM SPSS Version 23. In the SPSS

file of the data, in the "Variable" view, all relevant "Labels" were added, and all "Measure" changed to "Scale" for all except the first variable (Participants). The data were screened with the help of the "Analyze" tool through descriptive statistics and frequencies to have a further look at the data for possible elimination of errors.

3.12.2.1 Missing values

In surveys, missing values occur when no answer or data value is provided for the variable in a statement (Little & Rubin, 2019). Missing values are almost unavoidable incidence in survey research and can have a noteworthy effect on the conclusions that can be drawn from the data. Data can go missing due to incomplete data entry, equipment malfunctions, lost files, and many other reasons.

In any dataset, there are usually some missing data. In this research study, the missing values occurred because of nonresponse, a situation in which no information was provided for one or more items or a whole section (Bhandari, 2021). The other reason was due to dropout, which occurred leading to some questionnaires being returned with not a single answer provided (ibid).

In this research study, while respondents did not have to provide reasons for not providing answers to selected individual or groups of questions or not completing the entire questionnaire, the researcher loosely attributed the presence of missing values in the data to the nature of the work of the respondents, healthcare providers. Due to the shortage of healthcare providers, in particular doctors, in Ghana and most other parts of the world, doctors are always under pressure and hardly get time at work to participate in activities other things other than patients care. Secondly, some participants may have difficulty providing answers to some particular answers for reasons best known to them. Throughout these data, 7 instances of

missing data were observed with the help of the SPSS descriptive analysis tool, which generated output to that effect and was deleted.

3.12.2.2 Statistical techniques employed

The researcher used a combination of descriptive and inferential analysis. Data gathered through surveys were analyzed with statistical packages such as the Statistical Package for Social Sciences (SPSS) version 23. Tight (2022), revealed that multiple case study researchers need to be careful in the number of cases they choose to analyze due to the in-depth analysis of the empirical data obtained and the picture provided of every case. Data were constructed inductively from raw information; the role of the researcher is to interpret the meanings after obtaining the findings and to construct a guideline framework after finding the results. Working directly from raw information increases the appreciation of the information, which should be in a form that is easy to review repeatedly, such as written interviews or small parts of audio-taped material. Although researchers may have difficulties identifying dependent variables, a data-driven approach is still recommended in social and healthcare research as it is the most fundamental method of developing themes (Kiger & Varpio, 2020).

As a result, factor analysis was also used to further elaborate on the concept, such that larger measurable and observable variables were reduced to fewer latent variables that share a common variance and are unobservable, which is known as reducing dimensionality (Stankevičiūtė & Kunskaja, 2022). Factor analysis is a multivariate statistical approach commonly used in psychology, education, and more recently in health-related professions. This was meant to summarize data so that relationships and patterns among variables could be easily interpreted and understood. Data screening was conducted to ensure the working data were free of anomalies using the Analyze, descriptive statistics, and frequencies tools of SPSS and

generated output to eliminate any anomalies. The researcher began to conduct univariate statistics in order to have a fair knowledge of how the data were playing out for analysis – factor analysis. The following statistical techniques were also employed: Descriptive statistics, Validity and reliability, Correlation analysis, Test of differences, Regression analysis, Chi-test, and t-Test.

3.13 Data Quality Control
3.13.1 Validity

Validity is the degree to which a test measures what it purports to measure (Sireci, 2016; Chapelle & Lee, 2021). Validity is defined as the accuracy and meaningfulness of the inferences which are based on the research results. It is the degree to which results obtained from the analysis of the data represent the phenomena under study. The validity of the questionnaire data depends on a crucial way the ability and willingness of the respondents to provide the information requested. Questionnaires was tested on potential respondents to make the data collecting instruments objective, relevant, suitable to the problem and reliable. Issues that was raised by respondents was used to refine the questionnaires accordingly. Besides, proper detection by an advisor and subject matter expert was taken to ensure the content validity of the instruments.

3.13.2 Reliability

The consistency of research, meaning to what extent an experiment or test yields the same results on repeated trials is known as 'reliability' (Noble & Smith, 2015; Sürücü & Maslakci, 2020). The repeatability of a study will be strengthened if the results remain the same and if a researcher can replicate the same study again in another social setting without the results being affected (ibid). Without reliability, researchers would be unable to draw satisfactory

conclusions, formulate theories, or make claims about the generalizability of the study (Lindgreen, Di Benedetto, & Beverland, 2021). Furthermore, the reliability of the study was assessed by conducting multiple case studies and interviews with the chosen firms, together with semi-structured and unstructured interviews with several respondents at each firm, and extensive fieldwork in terms of observations.

Moreover, to measure the reliability of the data collection instruments, an internal consistency coefficient, the questionnaire was subjected to a reliability test. The Cronbach's alpha (α) test of reliability was adopted in providing a pretest of the reliability of the instrument and a post-test of the internal validity of the findings. Generally, a Cronbach's alpha ≥ 0.7 is interpreted to mean that the instrument is reliable (Schober, Mascha, & Vetter, 2021)

3.14 Study Sites

The healthcare system in Ghana is categorized into three sectors: the public sector (managed and funded by the government); the private sector (owned and managed by individuals/groups of investors); and those operated by non-profit organizations. E-consultation is not predominant in Ghana, with only a few health facilities offering these services to customers. The study was conducted using five health facilities/institutions in Ghana. These include Komfo Anokye Teaching Hospital (KATH), which is owned and managed by the Ghana Government, Maritime Hospital, Catholic Health Services (Hospitals), Nhyaho Medical Center, and Graphic Clinic. These facilities were chosen because e-consultation in the Ghanaian health sector is not common, and these are facilities known to be implementing e-consultation. Obtaining data from both government and privately-owned institutions aided in conducting a comparative analysis and addressing potential challenges that might be facing the current institutions and future implementation of e-consultation in other Ghanaian hospitals.

3.15 Ethical consideration

Conducting research ethically requires researchers to balance the value of advancing knowledge and non-interference in the lives of others (Alderson & Morrow, 2020). In recent times, the projects of academics working in non-medical research have increasingly come under the regulation of Human Research Ethics Committees. Given the importance of ethics for conducting research, research integrity encompasses specific codes and policies, which aim to address ethical principles such as honesty, objectivity, confidentiality, non-discrimination, and respect for intellectual property ((Brey, 2022).

As a rule of thumb, UKZN requires ethical clearance to be granted for all research involving humans and animals before the commencement of any data collection. Furthermore, participants were only to agree to participate in research after the grant of ethics clearance from the University. In this research, an ethical application was made to the UKZN Human and Ethics application committee, and clearance was granted. Additionally, an application was made to Komfo Anokye Teaching Hospital in Ghana for ethical clearance, and KATH ethics committee approval was granted.

Referring to the views of Blaikie & Priest (2019), the principles underlying research are universal and concern issues such as honesty and respect for the rights of individuals in the study. Ethical considerations were also addressed by the researcher briefing the respondents about the purpose of the research, their relevance in the research process, and expectations from them.

Moreover, the integrity of the data collection process was ensured. Respondents were made to feel as comfortable as possible by addressing their apprehensions. In addition, respondents were made aware that they were not under any obligation to answer questions that made them

uncomfortable, and that they could terminate the interview at any point should they experience any discomfort. Finally, respondents' privacy, feelings, and dignity were respected to ensure that they were left with a positive and pleasant experience, thereby enhancing goodwill and future cooperation.

Lastly, respondents were not harmed or abused, either physically or psychologically, during the course of the study. Instead, the researcher attempted to create and maintain a climate of comfort.

3.16 Limitations of the study

While the case study research method is deemed particularly useful for exploratory analysis, it cannot claim to be representative due to the potential for small and idiosyncratic samples. Another limitation is that certain variables, such as human, technological, and economic resources, might not be measured, even though they may be later recognized as important.

CHAPTER FOUR

ANALYSIS OF DATA AND DISCUSSION OF RESULTS

4.1 Overview

This chapter presents an analysis of the data collected and a discussion of the results. The chapter outlines the demographics of respondents, qualitative data analysis of clinicians and patients, and quantitative data analysis of clinicians and patients. This chapter enhances the researcher's understanding of interpretation and provides answers to the fundamental questions of the entire research study. Lastly, the chapter presents a model for the successful implementation of e-consultation in the Ghanaian Health Sector.

4.2 Demography

4.2.1 Clinician Demography

Table 7: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 30 years	12	24.0	24.0	24.0
	31 - 40 years	30	60.0	60.0	84.0
	41 - 50 years	4	8.0	8.0	92.0
	51 - 60 years	4	8.0	8.0	100.0
	Total	50	100.0	100.0	

Source: Field data, 2022

The study on clinicians had 50 respondents participating in total. The study had 60% of participants representing the age group of 31-40 years, followed by 24% representing the age

group of 20-30 years. The upper age groups of 41-50 years and 51-60 years had 8% respondents each. With 40 years as the median, the study found that the majority of clinician respondents are in their youthful days and are active in service.

Table 8: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	28	56.0	56.0	56.0
	Male	22	44.0	44.0	100.0
	Total	50	100.0	100.0	

Source: Field data, 2022

Table 7 shows that 56% of clinicians are female and 44% are male. This implies that the study was not gender-biased and that the views of both genders were taken into consideration.

Table 9: How often do you use computer at home?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Everyday	19	38.0	38.0	38.0
	Few times a week	17	34.0	34.0	72.0
	Few times in a month	3	6.0	6.0	78.0
	Never	1	2.0	2.0	80.0
	Sometimes	10	20.0	20.0	100.0
	Total	50	100.0	100.0	

Source: Field data, 2022

Table 8 shows that 38% of clinicians use a computer at home every day. Also, 34% of respondents use a computer at home a few times a week. Six percent (6%) use a computer at home a few times in a month. Two percent (2%) of the respondents have never used a computer at home before, and finally, 10% sometimes use computers at home. The study found that the majority of clinicians have access to computers at home. Hence, there is a high propensity for clinicians to engage in e-consultation even when they are at their houses.

Table 10: Level of Computer skills in usage of Microsoft Office

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	8	16.0	16.0	16.0
	Beginner	11	22.0	22.0	38.0
	Intermediate	9	18.0	18.0	56.0
	Advance	14	28.0	28.0	84.0
	Expert	8	16.0	16.0	100.0
	Total	50	100.0	100.0	

Source: Field data, 2022

From Table 9, respondents were asked about their level of skills in Microsoft Office. It was found that 16% of the respondents were novices, 22% were beginners, 18% were intermediate, 28% had advanced skills, and 16% were experts. The study found that very few clinicians were novices in the usage of Microsoft Office. This implies that over 80% of respondents have

practicable skills in computer usage. This feedback is positive for the development of an e-consultation ecosystem.

Table 11: Level of skills in Social Media usage (e.g Facebook, Skype, Twitter etc)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	8	16.0	16.3	16.3
	Beginner	8	16.0	16.3	32.7
	Intermediate	13	26.0	26.5	59.2
	Advance	9	18.0	18.4	77.6
	Expert	11	22.0	22.4	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Source: Field data, 2022

Table 10 assesses the level of skills of respondents in using computing applications such as Facebook, Skype, and Twitter. The study found that 16% of respondents were novices in using these applications. Another 16% were beginners, 26% of the medical staff had intermediate skills in social media application usage, 18% had advanced skills in using social media, and 22% were experts in social media usage. The study found that over 80% of the respondents have an appreciable level of skills in social media usage. This figure has a direct similarity with the clinician's level of skills in Microsoft Office usage (Table 4.4). This implies that most

clinical staff would be capable of using the basic e-consultation platform or an intermediate to advanced e-consultation platform with little orientation or training

.

Table 12: Level of Skills in Computer Trouble Shooting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	14	28.0	29.8	29.8
	Beginner	14	28.0	29.8	59.6
	Intermediate	9	18.0	19.1	78.7
	Advance	7	14.0	14.9	93.6
	Expert	3	6.0	6.4	100.0
	Total	47	94.0	100.0	
Missing	System	3	6.0		
Total		50	100.0		

Source: Field data, 2022

Table 11 reveals the respondents' level of skills in computer troubleshooting. It was found out that only 6% were experts in troubleshooting, 14% of the respondents were at the intermediate level, and 14% were at the beginner and novice stages each. It is not surprising that only a few respondents had a high level of computer troubleshooting because, in the medical field, such activities are reserved for the technicians and IT staff.

Table 13: Level of skills in E-mail Communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	6	12.0	12.2	12.2
	Beginner	8	16.0	16.3	28.6
	Intermediate	9	18.0	18.4	46.9
	Advance	8	16.0	16.3	63.3
	Expert	18	36.0	36.7	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Source: Field data, 2022

Communication is a crucial aspect of e-consultation. E-mail communication is one mode of communication. From Table 12, the study found that 12% of respondents were novices when it came to e-mail communication. Sixteen percent were at the beginner's level, 18% had intermediate skills, 16% had advanced skills, and 36% were experts in communicating through e-mails. In totality, over 90% of clinicians can communicate using e-mails.

Table 14: Level of skills in using Windows Operating System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	10	20.0	20.4	20.4
	Beginner	10	20.0	20.4	40.8
	Intermediate	9	18.0	18.4	59.2
	Advance	14	28.0	28.6	87.8
	Expert	6	12.0	12.2	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Source: Field data, 2022

Table 13 presents the respondents' level of skills in using the Windows operating system. Twenty percent of respondents were each at the novice and beginner levels. Eighteen percent of respondents were at an intermediate level, with 28% at an advanced level, and 12% at the expert level.

Table 15: Level of Skills in using Web Browsing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	10	20.0	20.4	20.4
	Beginner	7	14.0	14.3	34.7
	Intermediate	8	16.0	16.3	51.0
	Advance	9	18.0	18.4	69.4
	Expert	15	30.0	30.6	100.0
	Total	49	98.0	100.0	
Missing	System	1	2.0		
Total		50	100.0		

Source: Field data, 2022

Table 4.9 presents the web browsing skills of respondents. Twenty percent of respondents were novices, 14% were at the beginner stage, 16% were at the intermediate level, 18% had advanced skills in web browsing, and 30% were experts in web browsing.

Table 16: Level of skill in Data Visualization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	8	16.0	17.4	17.4
	Beginner	9	18.0	19.6	37.0
	Intermediate	10	20.0	21.7	58.7
	Advance	13	26.0	28.3	87.0
	Expert	6	12.0	13.0	100.0
	Total	46	92.0	100.0	
Missing	System	4	8.0		
Total		50	100.0		

Source: Field data, 2022

Data visualization is an essential aspect of modern medicine. Table 15 shows the various levels of skills of respondents when it comes to data visualization. The study found that 12% of respondents were experts in data visualization. Twenty-six percent of respondents were at an advanced level, 20% were at the intermediate level, 18% were at the beginner level, and 16% were at the novice level.

Table 17: Using personal Computer to access the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	2.0	2.0	2.0
	Everyday	10	20.0	20.0	22.0
	Few times in a month	5	10.0	10.0	32.0
	Few times in a week	15	30.0	30.0	62.0
	Never	5	10.0	10.0	72.0
	Sometimes	14	28.0	28.0	100.0
	Total	50	100.0	100.0	
Valid			1	2.0	2.0

Source: Field data, 2022

Table 16 reveals that 20% of respondents use their personal computers to access the internet every day. Ten percent of respondents use their personal computers to access the internet a few times a month. Thirty percent of respondents access the internet with their personal computers a few times a week. However, 10% of respondents have never accessed the internet with their computers. The study found that only 10% of the respondents do not use their personal computers to access the internet, which implies that 90% are capable of using the internet with their own computers. These results show that the basic tools for e-consultation by medical staff are readily available.

Table 18: Using Office Computer to access the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		8	16.0	16.0	16.0
	Everyday	9	18.0	18.0	34.0
	Few times in a month	3	6.0	6.0	40.0
	Few times in a week	5	10.0	10.0	50.0
	Never	7	14.0	14.0	64.0
	Sometimes	18	36.0	36.0	100.0
Total		50	100.0		

Source: Field data, 2022

Table 17 shows that 18% of respondents access the internet daily by using office computers. Six percent (6%) of the respondents do so a few times a month, 10% also access the internet a few times a week using office computers. However, 14% of respondents have never accessed the internet using an office computer. Besides, 36% of the participants sometimes access the internet with office computers. Table 4.11 established that 10% have never used their computers to access the internet. Meanwhile, table 4.12 reveals that 14% have never accessed the internet using an office computer. This implies that 4% of respondents (medical staff) only access the internet when they are at home.

Table 19: Using internet Café to access the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		9	18.0	18.0	18.0
	Few times in a month	6	12.0	12.0	30.0
	Few times in a week	1	2.0	2.0	32.0
	Never	20	40.0	40.0	72.0
	Sometimes	14	28.0	28.0	100.0
	Total	50	100.0	100.0	

Source: Field data, 2022

Table 18 shows how often medical staff use the internet café for internet services. Twelve percent do so a few times a month. Two percent (2%) do so a few times in a week, and 40% of the respondents have never used the internet café for internet services. Finally, 28% of the respondents sometimes patronize the services of internet cafés. Although the majority of respondents have never been to the café, comparing Table 4.11, Table 4.12, and Table 4.13, the study found that when it comes to using computers to access the internet, medical personnel find a means to do so when it matters. They do so at the office, at home, or visiting the internet café.

Table 20: Using Mobile devices to access the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Everyday	27	54.0	54.0	54.0
	Few times in a month	8	16.0	16.0	70.0
	Few times in a week	6	12.0	12.0	82.0
	Never	2	4.0	4.0	86.0
	Sometimes	7	14.0	14.0	100.0
	Total	50	100.0	100.0	

Source: Field data, 2022

Table 19 discusses how respondents use mobile devices to access the internet. The study discovered that 54% of respondents access the internet daily, and 16% access the internet a few times a month using their mobile devices. Furthermore, 12% of respondents use their mobile devices a few times a week. However, 4% have never used their mobile devices for internet services. Lastly, 14% sometimes use their mobile devices for internet services. This data indicates that 98% of medical staff have access to the internet using their mobile phones, implying that 98% of medical staff are capable of providing e-consultation services wherever they may be.

Table 21: Reasons why respondents chose "never" on access to internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		37	74.0	74.0	74.0
	"It's not allowed in the office.	1	2.0	2.0	76.0
	Against my ethics	1	2.0	2.0	78.0
	At the office, the secretary operates and at the cafe the attendant operates.	1	2.0	2.0	80.0
	Availability of internet access at all times	1	2.0	2.0	82.0
	Because I have access to my computer and cell phone	1	2.0	2.0	84.0
	Because I have my own computer and data on my phone to browse	1	2.0	2.0	86.0
	Do not have personal computers at home and office	1	2.0	2.0	88.0

		Percent	Valid Percent	Cumulative Percent
Easily get access to them through my phone and laptop so do not need to visit the café.	1	2.0	2.0	90.0
I have Internet access both at home and on the go; In fact, I access the Internet daily using my smartphone, iPad and laptop.	1	2.0	2.0	92.0
I have Internet service at home.	1	2.0	2.0	94.0
I have my personal computer so I don't go to the café.	1	2.0	2.0	96.0
I need not go to the cafe to browse.	1	2.0	2.0	98.0
Not convenient.	1	2.0	2.0	100.0
Total	50	100.0	100.0	

Source: Field data, 2022

Table 20 provides reasons why some respondents, representing 2% of medical staff, have never used office PCs, personal computers, or even their mobile phones to access the internet. Some

reasons include personal ethics, the secretary at the facility operating the computer, and the absence of internet access at all times. Additionally, most people do not visit internet cafés because they have access to computers and personal cell phones with browsing data.

Table 22: Type of internet connection used at home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	6.0	6.0	6.0
	ADSL/DSL	1	2.0	2.0	8.0
	Fiber Optics	5	10.0	10.0	18.0
	I do not have a home internet connection	1	2.0	2.0	20.0
	Mobile Phone Connection	27	54.0	54.0	74.0
	Modem	10	20.0	20.0	94.0
	WLAN	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

Source: Field data, 2022

Table 21 examines the types of internet connections used at home by medical respondents. It was revealed that 2% of respondents use ADSL/DSL connectivity, 10% use fiber-optic connections, and 2% do not have a home internet connection. However, 54% of respondents have mobile phone connections, 20% use a modem, and 6% use WLAN. The study found that, aside from the 2% without a home internet connection, 98% of participants are connected to the internet at home.

Table 23: Frequency of using internet chat room application

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2.0	2.0	2.0
Daily	13	26.0	26.0	28.0
More than a year	5	10.0	10.0	38.0
Never	7	14.0	14.0	52.0
once a month	2	4.0	4.0	56.0
once a while	19	38.0	38.0	94.0
weekly	3	6.0	6.0	100.0
Total	50	100.0	100.0	

Source: Field data, 2022

Table 22 demonstrates the frequency with which respondents use internet chat rooms. The study reveals that 26% of respondents use internet chat rooms daily, 10% used them more than a year ago, and 14% have never used them. Additionally, 4% of respondents use them once a month, 38% use them occasionally, and 6% use them on a weekly basis. The study found that about half of the respondents frequently use internet chat rooms. This suggests that it would not be challenging for medical staff to engage patients through chats on an e-consultation platform.

4.2.2 Patients Demography:

Table 24: Age (Patients)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 30 years	45	45.0	45.0	45.0
	31 - 40 years	46	46.0	46.0	91.0
	41 - 50 years	6	6.0	6.0	97.0
	51 – 60 years	0	0.0	0.0	97.0
	Above 60 years	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Source: Field data, 2022

The study on patients included 100 respondents from selected hospitals. The study found that 45% of respondents were in the age group of 20-30 years, 46% were in the age group of 31-40 years, 6% were in the age group of 41-50 years, and 3% were in the age group of above 60 years. No respondent was found to be in the age group of 51-60 years.

Table 25: Gender (Patient)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	34	34.0	34.0	34.0
	Male	66	66.0	66.0	100.0
	Total	100	100.0	100.0	

Source: Field data, 2022

Table 24 displays the gender of patients who responded to administered questionnaires. Sixty-six percent (66%) of respondents were male, and 34% were female, indicating that the study considered female participation.

Table 26: Frequency of Computer usage at home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Everyday	60	60.0	60.0	60.0
	Few times a week	18	18.0	18.0	78.0
	Few times in a month	4	4.0	4.0	82.0
	Never	1	1.0	1.0	83.0
	Sometimes	17	17.0	17.0	100.0
	Total	100	100.0	100.0	

Source: Field data, 2022

Table 25 presents the frequency of computer usage by respondents (patients). The study revealed that 60% of patients use a computer at home every day, 18% use a computer at home a few times a week, 4% use a computer at home a few times a month, 2% have never used a computer at home, and 10% sometimes use computers at home. The study found that the majority of clinicians have access to computers at home, suggesting a high propensity for clinicians to engage in e-consultation even when at home..

Table 27: Level of skills in Microsoft Office

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	1	1.0	1.0	1.0
	Beginner	19	19.0	19.6	20.6
	Intermediate	27	27.0	27.8	48.5
	Advance	21	21.0	21.6	70.1
	Expert	29	29.0	29.9	100.0
	Total	97	97.0	100.0	
Missing	System	3	3.0		
Total		100	100.0		

Source: Field data, 2022

Table 26 presents the respondents level of skills in Microsoft Office. One percent (1%) of the respondents were found to be a novice with 19% of respondents being beginners. Furthermore, 27% of respondents reported having intermediate skills in Microsoft Office. Also, 21% of respondents had advanced level skills and lastly, 29% were found to be experts in Microsoft office. The study found that respondents have a very good level of skills in Microsoft Office.

Table 28: Level of Skills in Social Media usage (e.g Facebook, Skype, Twitter   etc)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	4	4.0	4.1	4.1
	Beginner	14	14.0	14.3	18.4
	Intermediate	21	21.0	21.4	39.8
	Advance	27	27.0	27.6	67.3
	Expert	32	32.0	32.7	100.0
	Total	98	98.0	100.0	
Missing	System	2	2.0		
Total		100	100.0		

Source: Field data, 2022

Respondents were found to be conversant with various social media handles. Table 27 presents the level of skills of respondents in Social Media Usage. 4% of respondents were found to be a novice with 14% as beginners to social media. Also, 21% were found to be intermediate with 27% as advanced users of social media. Finally, the study found that 32% of respondents were experts. As the majority of patients are accustomed to social media, it suggests that they are aligned with modern communication trends and might not find it difficult to use e-consultation.

Table 29: Level of skills in Computer Troubleshooting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	24	24.0	25.8	25.8
	Beginner	16	16.0	17.2	43.0
	Intermediate	28	28.0	30.1	73.1
	Advance	14	14.0	15.1	88.2
	Expert	11	11.0	11.8	100.0
	Total	93	93.0	100.0	
Missing	System	7	7.0		
Total		100	100.0		

Source: Field data, 2022

Table 28 presents respondents level of skills in computer trouble shooting. Twenty four percent (24%) of the respondents were found to be novice. In addition, 16% of the respondents were at the beginners level skills whilst 28% were at intermediary skills. Furthermore, 24% had advanced level skills and 11% had expert level skills in computer trouble shooting.

Table 30: Patients level of skills in Email Communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	14	14.0	14.6	14.6
	Beginner	7	7.0	7.3	21.9
	Intermediate	18	18.0	18.8	40.6
	Advance	22	22.0	22.9	63.5
	Expert	35	35.0	36.5	100.0
	Total	96	96.0	100.0	
Missing	System	4	4.0		
Total		100	100.0		

Source: Field data, 2022

From table 29 we see respondents' level of experience in e-mail communications. The study found that 14% of patients surveyed were novice to e-mail communications. Also, 7% were beginners and 18% were found to be intermediate. Moreover, 22% of respondents had an advanced level of skills in e-mail communications whilst 35% of patients engaged had expert-level skills. The results show that patients already have exposure to electronic forms of communication, implying that using e-consultation platforms may not be challenging for most patients.

Table 31: Patients' level of skills in Windows Operating System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	14	14.0	14.9	14.9
	Beginner	23	23.0	24.5	39.4
	Intermediate	20	20.0	21.3	60.6
	Advance	16	16.0	17.0	77.7
	Expert	21	21.0	22.3	100.0
	Total	94	94.0	100.0	
Missing	System	6	6.0		
Total		100	100.0		

Source: Field data, 2022

Windows operating system is the most common and popular operating system in Ghana. The study aimed to determine patients' level of skills in the usage of Windows. The study found that 14% of respondents were novices, 23% were beginners, 20% had intermediate skills, 16% had advanced skills, and 21% had expert-level skills in using Windows.

Table 32: Patients' Level of skills Web Browsing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	8	8.0	8.5	8.5
	Beginner	15	15.0	16.0	24.5
	Intermediate	10	10.0	10.6	35.1
	Advance	20	20.0	21.3	56.4
	Expert	41	41.0	43.6	100.0
	Total	94	94.0	100.0	
Missing	System	6	6.0		
Total		100	100.0		

Source: Field data, 2022

Table 31 presents patients' level of skills in web browsing. Eight percent (8%) were found to be novices, 15% were beginners, 10% had intermediate skills, 20% had advanced skills, and 41% had expert-level skills in web browsing.

Table 33: Patients' level of skill in Data Visualization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Novice	19	19.0	19.8	19.8
	Beginner	13	13.0	13.5	33.3
	Intermediate	17	17.0	17.7	51.0
	Advance	34	34.0	35.4	86.5
	Expert	13	13.0	13.5	100.0
	Total	96	96.0	100.0	
Missing	System	4	4.0		
Total		100	100.0		

Source: Field data, 2022

Table 32 discusses patients' level of skills in data visualization. The study observed that 19% of respondents were novices, 13% were beginners, 17% had intermediate skills, 34% had advanced skills, and 13% had expertise in data visualization.

Table 34: Patients' frequency of using their own computer to access the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	4.0	4.0	4.0
	Everyday	35	35.0	35.0	39.0
	Few times in a month	6	6.0	6.0	45.0
	Few times in a week	16	16.0	16.0	61.0
	Never	15	15.0	15.0	76.0
	Sometimes	24	24.0	24.0	100.0
	Total	100	100.0	100.0	

Source: Field data, 2022

Table 33 displays patients' frequency of using their computer to access the internet. The study found that 35% of respondents used their computers to access the internet every day, 6% did so a few times in the month, and 16% accessed the internet a few times in a week. Additionally, 24% sometimes accessed the internet with their computers. However, 15% of respondents had never accessed the internet with their computer, indicating that not everyone has a personal computer or access to the internet.

Table 35: Patients' access to the internet using Office PC

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7	7.0	7.0	7.0
Everyday	32	32.0	32.0	39.0
Few times in a month	9	9.0	9.0	48.0
Few times in a week	9	9.0	9.0	57.0
Never	16	16.0	16.0	73.0
Sometimes	27	27.0	27.0	100.0
Total	100	100.0	100.0	

Source: Field data, 2022

Table 34 shows patients' access to the internet using their office computers. The study found that 32% of respondents used office computers every day to access the internet, 9% did so a few times in a month, and another 9% did so a few times in a week. Furthermore, 27% of respondents sometimes accessed the internet with their office computers, and 16% had never used an office computer to access the internet.

Table 36 Patients' frequency of using internet café to access the internet

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	13	13.0	13.0	13.0
Few times in a month	7	7.0	7.0	20.0
Few times in a week	2	2.0	2.0	22.0
Never	39	39.0	39.0	61.0
Sometimes	39	39.0	39.0	100.0
Total	100	100.0	100.0	

Source: Field data, 2022

Table 35 discusses how often patients visit internet cafés to access the internet. The study found that 7% of respondents visited the internet café a few times in a month, 2% visited a few times in a week, and 39% sometimes visited the café for internet services. Conversely, 39% of respondents had never used an internet café to access the internet. The reasons for this are explained in Table 4.32.

Table 37: Patients' frequency of access the internet using Mobile device

 Table 4.31

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2.0	2.0	2.0
Everyday	60	60.0	60.0	62.0
Few times in a month	6	6.0	6.0	68.0
Few times in a week	21	21.0	21.0	89.0
Never	2	2.0	2.0	91.0
Sometimes	9	9.0	9.0	100.0
Total	100	100.0	100.0	

Source: Field data, 2022

Table 36 shows that 60% of respondents accessed the internet daily using their mobile phones, 6% did so a few times in a month, and 21% did so a few times in a week. Moreover, 9% sometimes used their mobile phones to access the internet, and 2% had never accessed the internet using their mobile device.

Table 38: Further reasons by respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		62	62.0	62.0	62.0
	Am a student nurse	1	1.0	1.0	63.0
	Because I can always access the internet using my mobile phone	1	1.0	1.0	64.0
	Because I have internet access from my home	4	4.0	4.0	68.0
	Cause I don't need too	1	1.0	1.0	69.0
	Don't own a desktop computer.	3	3.0	3.0	72.0
	Don't work with computers	2	2.0	2.0	74.0
	Easy way of access	2	2.0	2.0	76.0
	Everything I will do at the internet Café can be done on my phone or my laptop at office or in the house	2	2.0	2.0	78.0
	I did not need it	2	2.0	2.0	80.0
	I do not go to the Internet café.	2	2.0	2.0	82.0
	I don't go to internet cafes	4	4.0	4.0	86.0

		Frequency	Percent	Valid Percent	Cumulative Percent
	I don't go to the Café	1	1.0	1.0	87.0
	I don't own a computer	2	2.0	2.0	89.0
	I don't have an office	1	1.0	1.0	90.0
	I have a laptop	1	1.0	1.0	91.0
	I have free access to data	2	2.0	2.0	93.0
	I use the other avenues. I do not need internet cafe.	1	1.0	1.0	94.0
	I'm not an office holder	1	1.0	1.0	95.0
	I've got a personal router and my workplace has no Wi-Fi system setup	1	1.0	1.0	96.0
	Internet cafes are rare in my area	1	1.0	1.0	97.0
	My place of work does not have internet access	1	1.0	1.0	98.0
	The privacy and security of information in the Internet cafe is very low hence I prefer to use personal devices.	1	1.0	1.0	99.0

		Frequency	Percent	Valid Percent	Cumulative Percent
	There's not access to internet at my workplace	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

Source: Field data, 2022

Table 37 presents the reasons why some respondents were unable to access the internet. The study found that some respondents did not visit the internet café because they could always access the internet using their mobile phones. Additionally, some people did not own computers at home, so they were obliged to visit the internet café. Others were unable to access the internet in their workplace through office computers because they did not have office computers for their work schedules. Furthermore, some respondents had office computers but lacked access to the internet.

Table 39: Patient medium of internet connection usage

		Frequency	Percent	Valid Percent	Cumulative Percent
ISDN	No	100	100.0	100.0	100.0
	Yes	0.0	0.0	0.0	100.0
ADSL/DSL	No	30	30.0	30.0	30.0
	Yes	70	70.0	70.0	100.0
Mobile phone	No	3.0	3.0	3.0	3.0
	Yes	97.0	97.0	97.0	100.0
Fiber Optics	No	92	92.0	92.0	92.0
	Yes	8	8.0	8.0	100.0
WLAN	No	78	78.0	78.0	78.0
	Yes	22	22.0	22.0	100.0
Modem	No	97	97.0	97.0	97.0
	Yes	3	3.0	3.0	100.0

Source: Field data, 2022

Table 38 shows that 100% of the respondents contacted did not use the ISDN internet connection in their various homes. Moreover, the study found that 70% of the respondents used ADSL/DSL for internet connectivity at home. Also, 97% of the respondents used their mobile phones for internet connectivity. This is positive for e-consultation implementation because most patients could have access to e-consultation services wherever they were. Notwithstanding, only 8% of respondents had access to fiber optics in their households.

Furthermore, 97% of the respondents used WLAN, while only 3% used a modem for internet connectivity.

Table 40: Patient usage of internet chat room

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	27	27.0	27.0	27.0
	More than a year	18	18.0	18.0	45.0
	Never	14	14.0	14.0	59.0
	once a while	30	30.0	30.0	89.0
	weekly	11	11.0	11.0	100.0
	Total	100	100.0	100.0	

Source: Field data, 2022

Table 39 displays patients' frequency of usage of internet chat rooms. The study shows that 27% of respondents used internet chat rooms daily, 18% had used chat rooms more than a year ago, and 14% of the respondents had never used a chat room. Moreover, 30% of respondents used internet chat rooms occasionally, and lastly, 11% of the respondents used them weekly. This confirms the findings of Zimmerman & Shaw Jr. (2020) that people feel safer and more secure when utilizing the internet for information since they can be more educated.

4.3 Qualitative Analysis:
Thematic analysis is a method of recognizing patterns within the data, where developing themes serve as the categories for analysis. Initially, the data were read and reread to identify and index themes and categories using NVivo: these mostly centered on particular phrases or

incidents. This phase, which refocuses the analysis at the general level of the subject rather than codes, involved categorizing the different codes into possible themes and organizing all the relevant coded data extracts in the identified themes..

4.3.1 Key words Clustered by Similarity
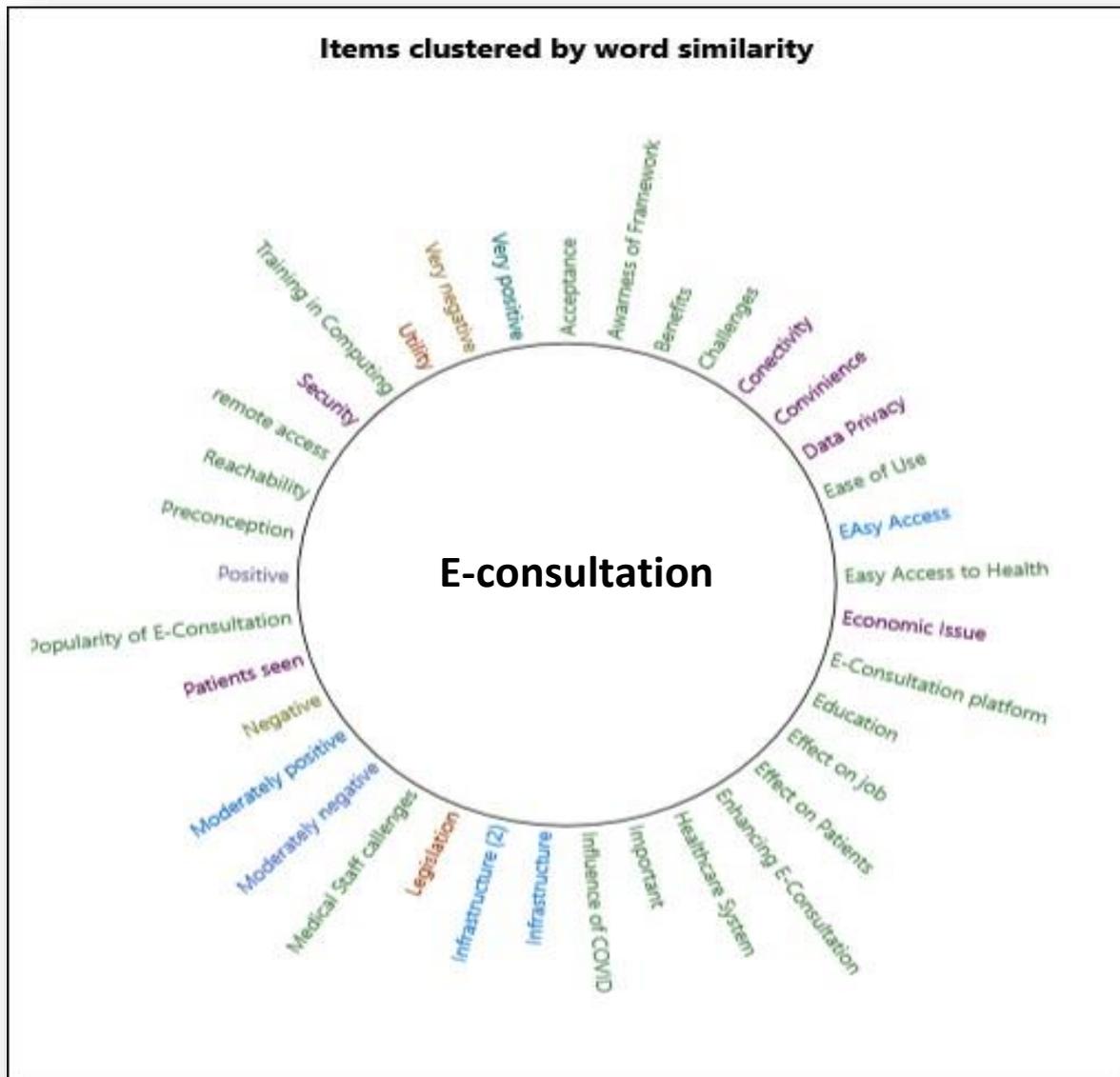
Figure 10: Key words Clustered by Similarity

Figure 10 shows keywords that emanate from the NVivo qualitative analysis in alphabetical order. These keywords range from acceptance to access, ease of use, security, reachability,

connectivity, education, and legislation, just to mention a few. These keywords helped the researcher to understand the centrality of inputs gathered from respondents. The researcher therefore discussed the outcome of the results in line with the research questions.

4.3.2 Hierarchical Structure
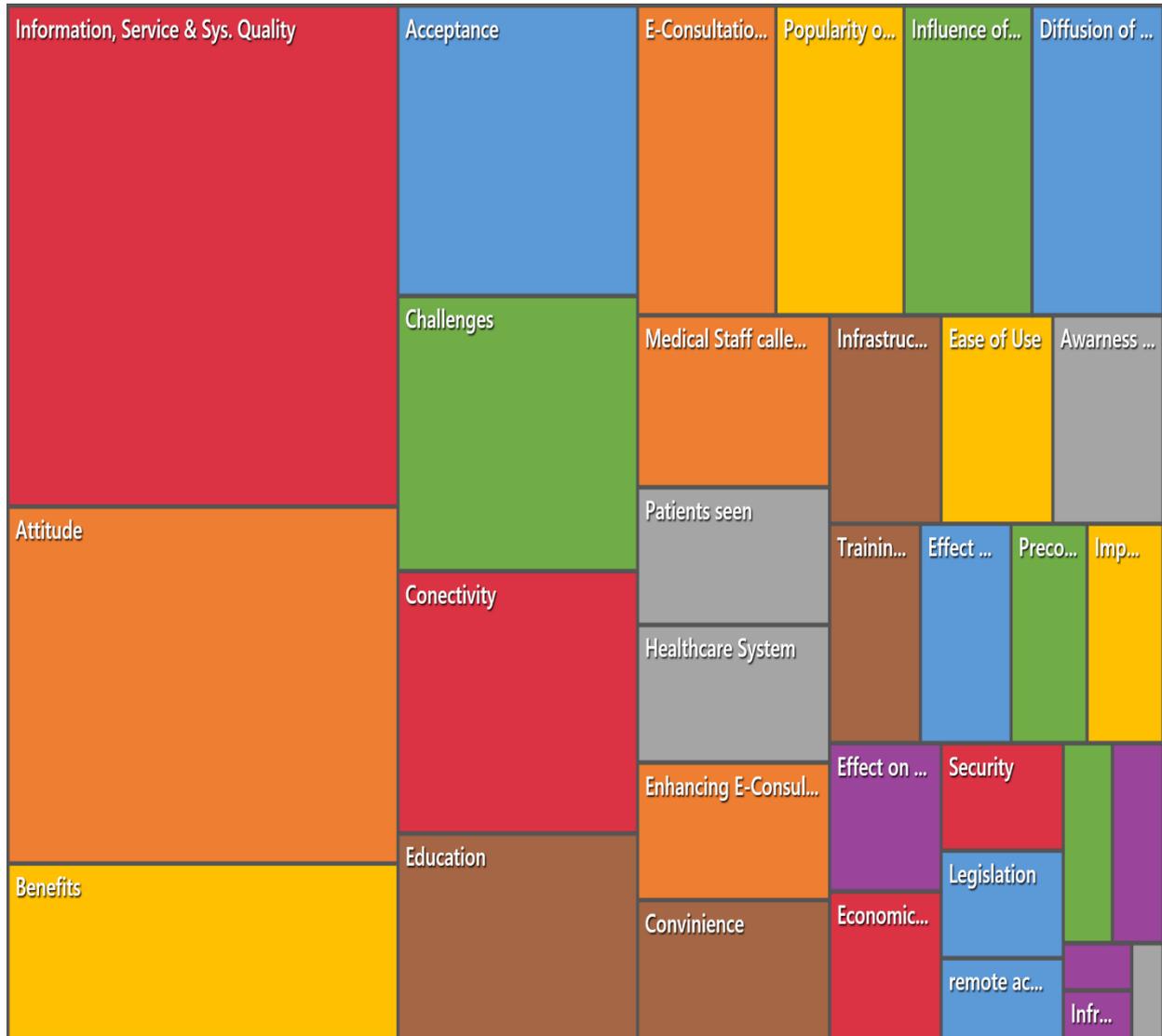
Figure 11: Hierarchical structure   Source (Author, 2022)

Figure 11 shows the hierarchical structure of keywords that emerged from the qualitative analysis. The structure reveals to the researcher how well respondents spoke concerning a particular issue or phenomenon. It helps in providing a visual understanding of how well

respondents placed importance on certain areas of study. From the hierarchical structure, it is observed that much emphasis was placed on information, service, and system quality, followed by attitude, benefits, acceptance, challenges, connectivity, education, etc.

4.3.3 Research Question 1: Why should the attitude of the General Public be considered in the implementation of E-consultation?

The attitude of the public is essential in the implementation of e-consultation because it influences the acceptance or rejection of the technology. The respondents believe that e-consultation can change the healthcare industry in the future. They are optimistic that the technology could provide various means of getting in touch with medical staff. One respondent mentioned that:

> *Respondent 4: "yes, it will change healthcare in the future, in that when people see that old part, like me going to the hospital myself, there can also be other channels to use. I can get to the doctor or the nurse at the comfort of my home"*

One respondent submitted that:

> *"Respondent 7: So when a doctor sits in the comfort of his own house, the patient also at the other end and consultation can be done is far better and faster as compared to what we have."*

Another respondent expressed dissatisfaction about how stressful it is to go to the hospital. Patients spend a lot of time at the OPD before they are attended to by medical staff. This confirms the findings of Re-Aldana et. al. (2022) that using e-consultation as an outpatient care program reduced waiting times significantly and was safe. Respondents were hopeful that e-consultation would help solve most of the challenges faced by health facilities due to the

enormous number of people who seek healthcare. It reaffirms the findings of Schettini, et al., (2019) that e-consultation reduced nephrology wait times and significantly increased referral completion rates. Moreover, in large integrated health systems, e-consultation has considerable potential to improve access to specialty care, reduce unnecessary appointments, and optimize the patient population being seen by specialists. Respondents showed delight in patronizing e-consultation for health delivery. Another respondent was of the view that:

> *Respondent 2: "Most patients will benefit because this technology helps you save time. And you know, our system in Ghana hospital, people don't like go into hospital, because they go and keep long day, they spend so much time. I think most patients will benefit from e-consultation technology, because it saves them the extra time and stress. In fact, you can go to a consultant and the queue will be too long. And most of them are people that just needed some one or two instructions, which could have been done via e-consultation."*

Attitude to e-consultation is shown in how the public perceive e-consultation technology and the willingness to use the technology. People would prefer to escape the hustle of hospital attendance and the congestion at the hospitals. In Africa, transportation is a big issue. Bus terminals are most often than not overcrowded with people struggling for space at peak periods. This type of congestion at the bus terminals makes the public vulnerable to certain kinds of disease. One respondent submitted that:

> *Respondent 5: "Because like I said, health seeking behavior will be influenced, there'll be less issues with transmission of infectious diseases, because the waiting areas will be less congested, people will be sitting in*

the comfort of their homes. During the consultations in the past, they

would have to get into a vehicle, maybe public transport, people in the

bus or taxis would be exposed when they come in contact with someone

who has an airborne disease. At the facility too, especially those at the

records and OPD area will be exposed. But if the person is sitting in his

house, and the doctor is also in his house, it reduces all of that risk for

us all."

Despite the interest and acceptance of e-consultation by the public, some people have concerns with data privacy and security. This type of concern also makes some people find it difficult to use e-consultation services because they feel that their details might be out there for everyone to see. This confirms other studies that the key barriers to using e-consultation for patients are privacy concerns and the security of their data ((Bos, van Tubergen, & Vonkeman, 2021; Qi, Cui, Li, & Han, 2021). They expressed their concerns as follows:

"Respondent 9: In Ghana data protection is not that instituted and or

some individuals are not too much concern about data protection as

compared to other places like maybe Germany and Switzerland."

Another respondent shared views on security issues concerning e-consultation. It was found out that those who do not have trust in e-consultation security measures have a dislike for using the system. A respondent mentioned that:

Respondent 8: "Security is very critical, because somebody can hack into

the system and get patient personal details. May be workplace next of

kin, phone numbers, or health details and so on. So when it comes to E-

consultation security is one major thing that is of concern to me, we have

to make sure that our system is secure."

Moreover, another respondent shared in the view just expressed by respondent 8:

Respondent 10: "Measures must be put in-place to ensure that there's the

cyber security and all that so people don't tamper with the information

that is being transmitted."

Data security issues are of course a great concern to Ghanaians, hence it negatively influences their attitude towards e-consultation. These findings affirm the findings of Seh, et al., (2020), who mentioned that privacy disclosure has been a big problem in the medical field. Users worry about not only the illegal disclosure but also the exposure to their family members with special diseases such as mental illness. The study also supports other findings that data privacy, confidentiality and security concerns have been mentioned as among the factors influencing the adoption of e-consultation in Ghana (Kesse-Tachi, Asmah, & Agbozo, 2019).

Notwithstanding, it has been observed that ease of use influences people's attitudes in accepting or becoming conversant with e-consultation. Qi, Cui, Li, & Han (2021) conducted a study to identify the factors influencing the public intention to use e-consultation and explore the effect path of the factors on behavior intention. The study found that perceived ease of use had a positive effect on behavior intention. This study confirms these findings and is expressed by a respondent as follows:

Respondent 3: "One attitudinal factor is patients' ability to use the e-

consult platform with ease. E-consultation developers and

implementers have to consider those who are not really technological

inclined. Yes. So if it's easier to use, easy to access everybody would be

willing to use the system and be happy. Yes. I think this will improve its

usage or development."

The study discovered that the reason why some people would reject or dissociate themselves from a technology is due to their inability to understand how it works or how it can be operationalised.

Respondent 6: "Those who cannot even read in English cannot access

the platform. So maybe we should also consider some of these things,

because it may be challenging for a patient who hasn't gone to school,

who cannot speak or read English to use the e-consultation system."

Naturally, people who can adopt new technology have the psychological expectancy of deriving benefits from the use of the technology than using a traditional or ordinary approach (Dash and Sahoo, 2021). Invariably, this study found that the attitude of the uneducated towards e-consultation differs significantly from the attitudes of the elite. The uneducated usually find it difficult to technologically adapt to new ways of doing things. Such people might prefer to stick to the traditional mode of medical consultation. Another respondent made a submission::

Respondent 1: "My brothers in the village do not like using such

platforms. Although they are fascinated by how it works, they still see it

as cumbersome. May be there could be ways we can do to change their

perspective or attitudes such that if the platform can be operated by

voice control in our local dialect or even if it's written in three other

languages that can reach out to more people. I think that would also

help because"

Users of e-consultation would expect the technology to make their clinical life easy or mitigate the hustle of having a face-to-face consultation (Dash and Sahoo, 2021), but people have to deal with cumbersome e-consultation platforms. This was buttressed by another respondent, who explained how the usage of e-consultation influences its adoption.

Respondent 7: Some of the e-consultation platforms are difficult to use, so that also boils down to the ease of use, some of them are complex, some too are very difficult to understand for both patients and even the healthcare workers. If we want e-consultation to be well implemented and successful then we should check these areas too''

The attitude of the public is an essential factor to e-consultation adoption and implementation. The study suggest that it is imperative for the attitude of the public to be considered in the implementation of e-consultation. In all the study identified that the general populace has a considerate attitude towards e-consultation. Despite the cautious attitude of a section of the public towards e-consultation, they however demonstrate an acceptance of the diffusion of the technology due to the rapid growth and expansion of the digital world. This is confirmed by a respondent as follows:

Respondent 9: "It is very, very important for us to introduce this e-consultation. Because as we are growing, as the world is evolving, technology is bridging the gap for transportation and all that. And it's quite expensive if you're to move from one location to another just for a consultation. So, I think is an important drive, that the nation or the country, all the healthcare should venture into e-consultation"

4.3.4 Research Question 2: How will the attitude of clinicians and hospital staff affect the implementation of E-consultation in a regular clinical setting?

Clinical staff are essential service providers in health care. Their daily activities have an impact on the overall wellbeing of patients. In this section, the researcher sought to find out how the attitudes of clinicians affect the implementation of e-consultation in a regular clinical setting. One respondent mentioned that e-consultation is helpful to them.

Respondent 2: "It helps us, especially when we are at work, we can attend to patients remotely, so they don't have to move from where they are to the facility. It makes communication easy as well."

Respondent 10: "The System is very effective because I can reach more people within a shorter time. It also reduces stress on health workers and the waiting areas too."

Respondent 3: "if someone has a concern or complaint, while I'm doing the in person consultations at the hospital, they will drop me a WhatsApp message. Then when I'm done, I would call them for more details, we'll do the consultation virtually. If there's anything I need to see a video or picture of maybe a swelling or rash, they will send it over then it would complete the consultation. I then send the prescription to our pharmacist, also by WhatsApp. And then we'll package the medication and send to the patient wherever he/she is. Finally at the schedule time, we'll do the review again by WhatsApp video."

Some clinicians expressed their commitment to the implementation of e-consultation by

indicating the number of patients that they consult for during working and off-duty periods.

> *Respondent 5: I use e-consultation as part of my work schedules. I am able to do an average of about 15 to 20 patients in a week.*

> *Respondent 4: I can't say but roughly in a week I attend to 10 patients using e-consultation platforms. During working hours at times it's not convenient to engage other people via e-consultation because you might be attending to other stud but for the love that we have for the job we accommodate all these engagements"*

> *Respondent 7: "Over here we have e-consultation integrated into our systems so people can call in and book for their e-consultation needs. So, in a week, I can attend to 80 to 100 patients."*

> *Respondent 10: We do a lot of online cases, maybe on weekly basis we attend to about 30 patients*

> *Respondent 6: I can't really say a number, but probably I am able to use E-consultation to address the medical needs of more than 10 people a week.*

The attitude of medical personnel towards the use of e-consultation is partly due to the type of platform used. The convenience, the cost, the ease of use, and challenges faced by medical staff are some of the factors that influence their attitudes to either become more receptive or indifferent to the use of e-consultation. The study found that most facilities did not have a centralized e-consultation system nor a formalized approach to the implementation of e-

consultation. Most health workers relied on available free and open-source platforms for e-consultation services.

> *Respondent 4: "My hospital does not have a dedicated platform for e-consultation so we rely on mainly phone calls and, WhatsApp video calls. If the doctor wants to see how the patient is, then in that case the video call is used."*

> *Respondent 3: "Usually is normal phone calls okay, either text or sometimes text message, WhatsApp or normal phone calls that is apart from what we do in the hospital."*

> *Respondent 8: "We still have to contact patients after they even leave hospital, on phone and then find out certain specific things of mutual concern. There are some people we need to discuss some of the cases with other specialists then when we get the information, we reach out to them on the phone to discuss it further. So basically people I know also contact me either through texts or calls on things concerning their health."*

The study observed that some health workers have embraced the idea and implementation of e-consultation. They have transitioned from having a one-on-one consultation to one-to-many consultation, that is, establishing a virtual clinic.

> *Respondent 9: At this hospital we combine both the computer and smart phones depending on what the engagement might be., so at times we use zoom, phone call, WhatsApp Video Call, or just*

WhatsApp audio call. For instance, this week we had antenatal clinic

on zoom.

Respondent 1: "Due to the advent of Covid 19 we at times run virtual

clinics. We are currently using mobile phones, zoom and Teams, if

the patient is comfortable with those applications, that's what we

currently use. But for the virtual clinics we use Zoom is easily

accessible and common."

The diffusion of technology is fueled by its relevance and users' attitudes. The study discovered that medical staff were indifferent to the technology's usage due to the challenges involved. They perceive a degree of disparity between the traditional method of consulting and e-consultation due to difficulties in making diagnoses and addressing patients' issues. Some respondents submitted the following:

Respondent 2: "so in general sense, sometimes it's a bit difficult for

patients to describe exactly what they are feeling and, you'd have to

pre envisage what they want to say. This makes consultation bit

difficult"

Respondent 10: "Communication is sometimes an issue, some of the

patients, even though they like privacy, they're not even able to

express themselves. So asking, what exactly is wrong with them makes

diagnosis a bit difficult. But, also sometimes you need to examine the

person physically, to be able to know what's wrong with the patient.

These are some of the issues we have with e-consultations."

Respondent 8: "So currently one thing that comes to mind is, sometimes when you have done e-consultation over a period of time, the patient will still need to come in for a review (face to face consultation). So maybe if there's an abdominal pain or something, you still would have to touch and press and see where exactly the pain is located. But interestingly if they're so used to the e-consultation, then they drag their feet when they have to come in for the face-to-face consultation because so far it has been convenient for them."

The study also observed that some doctors are not comfortable with e-consultation because they cannot access patients' histories. This corroborates the study by Srinivasan et al. (2020), which found that using only e-consultation, especially when the doctor has no previous relationship with the patient, is difficult. This is particularly true for medical staff who resort to WhatsApp, Zoom, and phone calls but do not have a well-functioning and integrated hospital-wide e-consultation system.

Respondent 7: "The history and examination are very important. So the examination part is, is quite important as well, especially for patients who may not know or may not be enlightened about their health, because they may not be able to communicate all that you need"

Respondent 5: I did E-consultation with one of my patients who leaves very far. He was involved in an accident, so we did the video calls, and I was assessing the wound. And at a point, he had to come in for us to take a swab, and then do a dress and take samples to the lab and do

the dressings for him. Considering that he had to travel all the way

from Cape Coast to Accra. It took him about one week to make that

decision. He could have gone to a nearby facility. But he also didn't

want to go because we had started the consultation here. And he felt

we had his details.”

The study noted that clinicians' attitudes towards e-consultation are also influenced by technical

factors beyond their control, such as connectivity, power outages, and the continuous supply

of data.

Respondent 10: “Because full provision hasn't been made for e-consultation at this hospital, if you are inside the facility, communication with patients may be smooth. Also, once you leave the hospital and a patient contacts you, cost of data usage becomes the doctors own cost. So it comes at a cost to the medical staff outside the working hours. And it may end up defeating the whole process. Because after working hours, you want more patients be able to still access some level of health. But if it's going to come at a cost to us, then it may be a disincentive for us to use e-consultation.”

Respondent 5: “E-consultation via the hospital pc is okay but regular power fluctuation discourages me from using the application. Imagine having a consultation with a patient remotely and your system goes off in the middle of the consultation it becomes embarrassing and frustrating. So if the facility does not have probably some sort of

uninterrupted power supply or UPS. Once the power goes off, then

you are stuck."

Respondent 1: Sometimes you try to maybe connect to a patient on

WhatsApp video. You do your best, but it would not work. We have Wi-

Fi connected here all round and each of us is having his password on

how to connect, but sometimes, I don't know if the workload on it is

too much. So, he it jams, then you cannot do anything about it. So, if

the patient was here in person you would have done whatever you

should to make him feel better."

Despite the varying attitudinal characteristics of medical staff towards the use of e-consultation, the study concludes that clinicians' overall attitude towards e-consultation is welcoming. Some respondents are hopeful that structures could be put in place to make it more comprehensive and widely adopted. The following were comments from some respondents.

Respondent 3: "E-consultation won't really affect my job in any

way."

Respondent 4: "E-consultation has a limitation, but it protects us

by limiting infections and other things whilst you're able to attend to

patient remotely"

Respondent 10: "Okay, it's, it's I think we all have to embrace it

because it's a nice concept. It will reduce the pressure at the

hospital. Some people come to the hospital, but their issues are

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minor and could be dealt with remotely."

Respondent 8: "E-consultation is now a global trend, if you don't want to be stagnant but advance and move with the times then these are some of the technologies we have to adopt in helping us do things better, and maybe more efficiently."

Respondent 1: "E-consultation is going to change everybody's workflow out, there is no going to be the need for IT staff to come all the way to the hospital to provide any support services. So they just have to do a remote to where the doctor is then helped them with their support services in the comfort of their homes."

The study notes that clinical staff have embraced the usage of e-consultation despite the challenges it presents. They demonstrate a positive attitude towards e-consultation and are optimistic that it is the current and future direction. The findings of this study contradict those of Rodger et al. (2019), who discovered overwhelming evidence of doctors' concerns regarding strained relationships with patients due to e-consultation usage. Consequently, some doctors have disapproved of using e-consult tools because they negatively impact the doctor-patient relationship. However, this study's findings confirm the research by Dash and Sahoo (2021), who identified an affirmative and significant relationship between a physician's intentions to adopt e-consultation.

Ghana has a shortage of quality health facilities, which has resulted in overcrowding at polyclinics and regional hospitals. Some Ghanaians resort to herbal and traditional care not because it is their best option, but because it is the only option available. Medical staff

receptivity and a positive attitude towards e-consultation will help bridge the gap between urban and rural populations. Therefore, it is understandable that the perceived usefulness of e-consultation has the potential to influence the attitude of medical staff and the public positively, encouraging the adoption and use of e-consultation (Qi, Cui, Li, & Han, 2021).

4.3.5 Research Question 3: Why should factors influencing the adoption of E-consultation be considered in system development, deployment and usage?

The need for technology-based systems in the Ghanaian health sector is growing daily, with advanced technologies being utilized to boost system efficiency. In Ghana, studies have examined the rise of mobile technology in the healthcare industry (Al Dahdah, 2021; Preko & Boateng, 2020). The expanding need for medical services has resulted in the necessity to differentiate healthcare delivery by hospitals while increasing service delivery speed. Consequently, the development, deployment, and usage of e-consultation becomes an area of concern. The societal acceptance of e-consultation, particularly in Africa, is not fully appreciated due to its implementation. The study gathered responses from various interviewees as follows:

Ease of Use: The ease of access enables people to become attached to technological systems. The study by Mold, Hendy, Lai, & de Lusignan (2019) found a strong relationship between ease of use and acceptability, especially for those with long-term conditions and patients located in remote regions.

> *Respondent 6: "One crucial factor to be considered is ease of use*
>
> *with the patient, because in the development of e-consultation you'd*
>
> *also have to consider those who are not technologically inclined. So*

it should be easier to use, and easy to access. I think this will improve

its usage or development."

Respondent 8: "So I think the most crucial aspect is working on

developing a system that can be easily understood, easily used and

flexible such that medical staff can easily use the system for

diagnosis, access history of patients and modify records"

Respondent 2: "I think we are making progress with e-consultation.

But we'll still have a long way to go. Everyone has a phone now.

There's fair access to computers. So the e-consultation applications

should be compatible with all types of phones. Developers should

know that rural folks do not use high standard smart phones"

This study also confirms the findings of Minsun & Heui (2020), who conducted a study to validate the DeLone and McLean information system success model in the context of a hospital information system in a developing country. The study highlighted that the design of hospital information systems, like e-consultation, should be easy to use, flexible, and functional to serve their purpose.

Payment Portal:

The study discovered that most medical staff engaging in e-consultation do so freely at their own cost, without receiving any financial benefit or proceeds to defray their mobile data expenses. The research found that some hospital managers do not take e-consultation seriously, as they believe it might not generate revenue. However, it was revealed that very few health

facilities have an integrated platform enabling patients to make payments for consultations remotely. One respondent made a submission:

> Respondent 5: *"Some hospitals find it costly to signup to visa or credit card payment platform, now we can use mobile money. We need to adequately compensate for that service rendered. Now with the mobile money in Ghana, they can integrate it to the e-consultation platform securely. Patients can make their payments and get receipt instantly."*

When it comes to the financial aspect of e-consultation, most hospitals operate within budget constraints due to underfunding. Maheu & Atanda (2022) mentioned that greater healthcare financing is highly linked to e-consultation adoption. First-world countries have the financial means to invest heavily in research to develop information systems that match the needs of their own healthcare systems (Almacen & Cabaluna, 2021). This study confirms these findings and further suggests that health facilities should adopt innovative ways of synchronizing their e-consultation systems with indigenous money payment platforms like Mobile Money or Ghana Pay.

Connectivity:

Without connectivity, e-consultation would be a standalone app. The study found that the deployment and usage of e-consultation are heavily dependent on smooth connectivity between clinicians and patients. As already discussed, most clinicians are interested in having a fully functioning e-consultation system at various hospitals. However, there are challenges beyond their control. Some respondents shared their views as follows:

Respondent 7: "My first issue is connectivity. Because even with basic devices, you have some level of access to audio and video which helps in e-consultation. So once the connectivity is sorted, e-consultation will have no boundaries."

Respondent 1: "We are going to touch a lot of customer bases, and if the network structure in the whole country is not up to that, then it's going to be a major problem. Then in terms of computers. For this hospital we have the capacity to getting computers, devices to aid the whole process but we don't control connectivity in the public space."

Currently, poor-quality connectivity interrupts the smooth flow of e-consultation, which is detrimental to both the physician and the patient. This finding aligns with the study by Indria, Alajlani, & Fraser (2020), which reported that delays in sending patient referrals were due to poor internet connections. Moreover, the frustration caused by poor connectivity can dissuade people from using e-consultation. It is therefore unsurprising that some elderly patients, or as known in Ghana, "Born before Computer" (BBC), still prefer face-to-face consultations even when there are no issues with connectivity and access. Some respondents shared their views as follows:

Respondent 3: There are few challenges, connectivity, when you are interacting with the customer or patient and, there's bad network, which interrupts the consultation and the person doesn't maybe use a smartphone, it's difficult to have images of their

problem as well and this affects quality diagnosis and treatment

if need be."

Respondent 7: "sometimes the network is so slow, you'll be seeing

patients and because of the slow network, it will take you extra

time than you would have seen if the patients you were just

writing."

Respondent 4: Yes, yes. Definitely. Sometimes when you're on a

video call, it will just freeze or hang or when there's a regular call

coming in, then it drops and you have to restart. Sometimes the

internet connectivity is very bad. There are echoes in and all of

that or the other person is on the move out, talking? And they

move to an area where the reception is low.

Another respondent added gave an input as found below:

Respondent 2: Thankfully to Covid-19, e-consultation is now the

order of the day. So, let's say for example, we are on the full drive

now, we are doing more virtual care, and then suddenly, we say

the hospital data center is down. Everything will come to a

standstill; we cannot consult virtually. The hospital will be losing

money. So connectivity is key and we must all collectively do

something about this."

When it comes to implementing e-consultation, healthcare facilities assess internet availability and quality of communication within their community or catchment area. The quality of internet services provided by the Internet Service Providers (ISPs) influences health managers'

decisions to implement e-consultation on a full scale or in parts. A respondent made a submission as follows:

Respondent 10: Now everything is in the cloud, nobody wants to buy servers, put on electricity, air conditioning, and all that. Nobody wants that. So is now we do more of online, cloud computing. Where we do most of our things online as we call it, Software as a Service (SAAS). So that's what we are driving towards. Most of our applications are even online. We don't need to be running them on servers. Talking about connectivity I will shift the blame to the ISP, they are to ensure that this fiber optic cables and other things, the new advances in terms of connectivity are working. We want to upscale our E-consultation services, but these things draw us back.

Data:

Data is often considered the new oil of the 21st century. The analogy that "data is the new oil" emphasizes the profound significance of data in the 21st century, akin to how oil has been a pivotal resource in the past. This comparison extends to the extensive use of e-consultation, where the wealth of generated data becomes a valuable raw material for innovation and insights in healthcare. Similar to how oil extraction can be tailored to specific needs, e-consultation data enables personalized healthcare services and predictive analytics for anticipating health trends. Much like oil's impact on economic decisions, data from e-consultations can inform healthcare policies, contributing to resource allocation and program design. The analogy also highlights the need for addressing the high cost of data services to ensure equitable access, making e-

consultation and its data-driven potential accessible and beneficial for all sections of the population. Ghanaians pay a high cost for data services compared to other countries in Sub-Saharan Africa. The study noted that the high cost of data does not encourage some sections of the populace to utilize e-consultation, especially if it requires a video session. The study suggests that e-consultation deployment should offer options for audio and text-only, in addition to video consultation. Patients should have the opportunity to switch between these modes without any challenges. The author believes this would help address the high cost of data usage by patients. This would also benefit the health sector, as clinicians sometimes need to follow up with patients for additional information depending on the level of interest in the case. Thomas et al. (2022) conducted a study on physicians' perceptions of e-consultation adoption amid the COVID-19 pandemic and found that patients lack the necessary resources, such as digital devices, data, and reliable internet. This finding is confirmed by the respondents as follows:

> *Respondent 6: "Currently in Ghana one major problem is access to cheap data. Okay, the major problem is data. The Internet itself is not that fast. And again, we are spending too much on data as compared to other countries. Okay, so one of the major shortfalls that will restrict or curtail the progress of this e-consultation is data"*

> *Respondent 9: "You know, we're fast evolving. Every now and again, structures are being constructed all over the place. So there's a faulty wire affecting connectivity. You may have internet connectivity one instant and not the next. All of that data is also*

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now fairly pricey. As a result, I believe we still have a long way to

go."

Legislation:

The COVID-19 outbreak has forced a shift to remote operations throughout society, from companies to churches, schools, and holiday festivities. Hospital procedures are not exempt from this requirement. Respondents provided their submissions as follows:

Respondent 10: In-terms of Legislation, this system is new. So, and I don't see any proper legislative laws to back them as well. Ultimately, people might have the opinion that once they're not sure of legislative instrument backing e-consultation in health services they would not sign up to it.

Respondent 6: I'm yet to be educated more on what Ghana has in terms of law about e-consultation, I feel like our policies are not really strong, because most of the systems have worked with do not have any backing policy."

Respondent 1: But it's very likely that we are still new in developing policies and legislature for e-consultation. So, it's an area that governments to have to look into, because it will help improve health care.

The study noted that Ghana's existing e-consultation practice falls short of legal policy. E-consultation introduces new responsibility challenges for healthcare facilities to address legalities (Mold, Hendy, Lai, & de Lusignan, 2019). Therefore, involving public policy stakeholders at the national level would enable a transparent policy-making process and promote social acceptability, compliance, and use of e-consultation.

4.3.6 Research Question 4: How does the implementation of E-health technology framework influence the acceptance of E-consultation in Ghana?

Ghana developed an e-health plan in 2010, which aims to: simplify the regulatory framework for health data and information management; strengthen sector capacity for broader implementation of e-health solutions in the health sector; increase access and close the equity gap in the health sector by utilizing ICT. The study sought to determine how this e-Health strategy by the Ministry of Health promotes the implementation and usage of e-consultation in Ghana. The following are the submissions of respondents regarding the statement in question:

> *Respondent 4: I'm not sure if the Ministry of Health has a framework*

> *Respondent 7: "Well, we started gradually but as at now, I think almost all the institutions use e-consultation in a way if not fully. I have not come across any framework by the Government to promote or guide the implementation of e-consultation"*

Respondent3: "Well, my little take is that if the Ministry of Health

will be able to improve on e-consultation I think it will go a long

way to help us. I don't see that in the e-Health Framework, but

they can include it and work on it."

Respondent 6: "I learnt there's some paperwork ongoing. There

have been pilot projects, they picked a few family physicians to

train them in e-consultation it in them. So, I think it wasn't an idea

that will suit the entire service across for all the doctors because

they are still in the pilot phases."

The study found that the Ministry of Health does not have a specialized policy on e-consultation. Furthermore, the current ICT Strategy Framework does not address the concerns of e-consultation from the development stage through implementation to usage. E-health friendly policies are not being developed because policymakers have limited exposure to the e-health discipline and potential benefits of this area (Qureshi, Farooq, & Qureshi, 2021). Ghana is currently undergoing a digital revolution, with the majority of its populace owning a handset. Additionally, most of these individuals are social media compliant. This alone sets the stage for e-consultation. It is therefore crucial for the Ministry of Health to pay close attention to e-consultation in the Ghanaian context. This study supports the findings of ElMassah & Mohieldin (2020) that infrastructural plans play a significant role and remain incredibly important in the case of lower and middle-income countries. Hence, digital health projects and organizational change approaches should be considered to ensure successful implementation (Dendere, Janda, & Sullivan, 2021). Moreover, there is a need to develop different frameworks that enable e-consultation to be widely used.

Education

When it comes to implementing e-health technologies, education plays a major role in the diffusion, popularity, and acceptance of e-consultation. The study found that 8 respondents emphasized the need for education in creating awareness for the usage of e-consultation. Through deliberate, controlled learning, which is frequently achieved through a well-planned educational program, a change in perception can be addressed. Establishing knowledge is crucial for later learning new things. Also, 7 out of the 10 respondents mentioned how education can help increase the acceptance and usage rate of e-consultation, as shown in the pictorial view (figure 12).
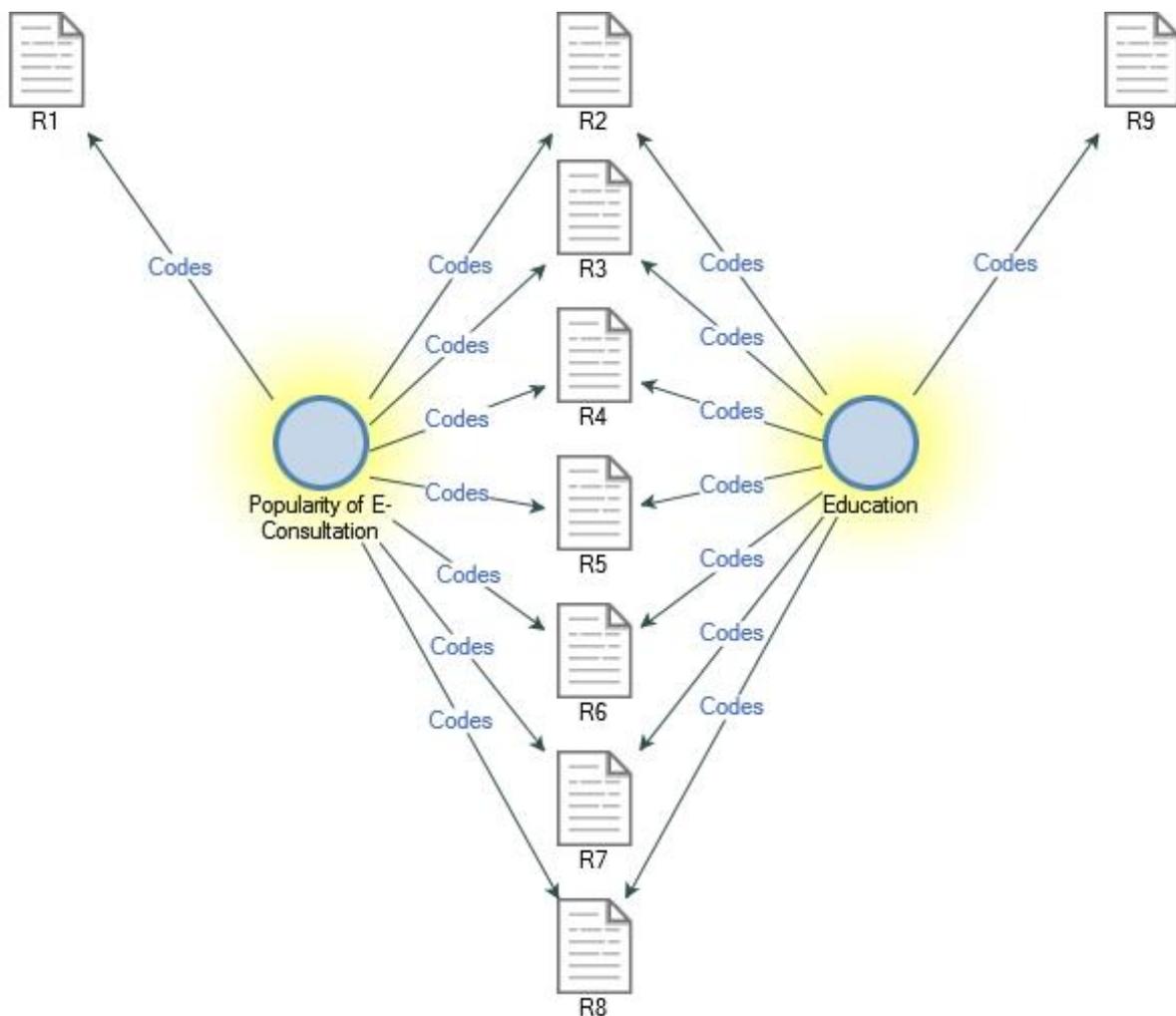
Figure 12: Comparison diagram of Education and Popularity of E-consultation

From the interviews, respondents shared their thoughts on how education can help Ghana implement e-consultation. When it comes to e-consultation, education of the general populace and medical staff is important in developing observational skills that need to be rediscovered and honed to establish a diagnosis remotely (Wijesooriya, Mishra, Brand, & Rubin, 2020). They provided their inputs as follows:

> *Respondent 6: "People are being used to one way of life when they have to come to the hospital. So, I believe if the education is about to go out there variably most patient will adopt e-consultation due to its comfortability".*

> *Respondent 2: "So if the advertisement is able to go out, and we engage the important stakeholders, as I mentioned, the print media, the television, the radio station, not all only them, but we the health workers as a whole. It should be a whole ecosystem; I think the enlightenment will make Ghanaians fully adopt e-consultation."*

Some respondents are of the view that awareness creation holds the key to successful implementation of e-consultation.

> *Respondent 4: "I think awareness creation is important, like using the social media. I think a lot of these eHealth forums and apps are helpful nowadays. I've seen a lot of adverts on Instagram, and other social media platforms telling people to download these apps where they can contact a doctor. Some of my colleagues are on*

and they are reaching out to people. So, I think awareness is very

important, especially social media."

Respondent 5: So, in terms of promoting it, I think more adverts

should be done. The awareness should start coming up so that

people know that oh, now if I get my lab results I might not have

to go to the hospital again, I can do a virtual consultation and am

done. And then drugs will be prescribed, and I can get it at the

comfort of my home. So, the promotion has to start now. Across

the whole country".

Respondent 3: "We have to give more education for them to adapt

it. So now that we are trying to include the use of phones and other

things, then we add it, through messages, education on the on the

phone."

Rolling out e-consultation efficiently requires that medical staff should be trained and equipped to use various consultation tools while also adapting to patients' needs (Murphy, 2021; van Galen, et al., 2019). When medical staff are well trained, they would be in the best position to educate patients on matters of e-consultation. Nevertheless, some respondents were of the view that health facilities should devote time to promoting e-consultation due to its benefits. They mentioned as follows:

Respondent 8: "The health sector should have some particular

time of day set aside to enlighten people educate with more easily

about this offer." Also, if people are made aware of the benefits

that we could derive from adopting e- consultation then there may

be a lot more facilities that will adopt it."

Respondent 7: "I think we should let people know the benefits.

Hospitals that are using it should let others know the benefits and

downfalls as this can encourage other hospitals to adopt this

technology."

Respondent 2: "Once is about people we have to educate them

and help even if it's, let's say pass on a law, to have e-consultation

services in every health facility. Once we do that when people

come around, we can have different option that meet their needs

and pocket. Also, the Internet is always there so everybody will

get to be familiar with it."

Respondent 4: "In addition to the education, we need an in-house

education too. Sometimes few days training on the job or use of

webinar, and other things to improve upon how to use the

computers and e-consultation can also help us."

Others are of the view that Policy makers should be well educated and involved in the e-consultation campaign:

Respondent 6: "I think that a whole campaign, you know, to sell

it to the public and also to the policy makers, because once the

policymakers embrace it, then there'll be the willingness to invest

The lack of education on the benefits and availability for patients to use e-consultation derails the successful adoption and implementation of e-consultation in the health sector. Patients' education and learning have the propensity to boost the possibility of having more satisfied patients. (Kose & Oymak, 2019). Moreover, a more informed patient, due to educational enlightenment on e-consultation, can interact better with his/her primary doctor, and this subsequently leads to a better understanding and usage of e-consultation services, resulting in improved quality of healthcare (Kose & Oymak, 2019).

4.4 Quantitative Analysis: Clinician's Perspective
Table 41: Knowledge, Skills, Performance

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I intend to use e-consultation for client care as often as is needed	0	10	24	38	26
Using e-consultation will increase my productivity	2	10	22	36	28
I will spend less time on routine job tasks when using e-consultation	6	6	26	32	28

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Using computers will enhance my effectiveness in client care management	2	8	18	36	34
Using e-consultation will increase my chances of obtaining promotion	18	12	40	16	10
Using e-consultation will increase my chances of getting in increase in salary	20	24	40	6	8
Using e-consultation decreases the time needed for my job responsibilities	6	20	30	22	18
I expect to find e-consultation easy to use	0	12	18	42	26
E-consultation will improve my practice	0	14	18	40	26
Using e-consultation enhances my effectiveness in my job	0	12	20	42	24

Source: Field data, 2022

Table 40 discusses clinicians' perspectives on their knowledge, skills, and performance in using e-consultation. 38% of the respondents strongly agree and 24% further agree to having the intention to use e-consultation for client care as often as needed. Also, 28% of respondents

strongly agree and 36% agree that using e-consultation will increase their productivity. However, 10% of the respondents disagreed with the statement, and 22% remained indifferent. Moreover, 24% of the respondents strongly agree and 28% further agree to spending less time on routine job tasks when using e-consultation. In addition, 36% of respondents agree that using computers will enhance their effectiveness in client care management, with only 2% of the respondents disagreeing with the statement. Notwithstanding, 18% of respondents strongly disagree and another 12% disagreed that using e-consultation will increase their chances of obtaining promotion.

Again, 20% of respondents strongly disagreed and another 24% disagreed that using e-consultation will increase their chances of getting a salary increase. In addition, 6% of respondents strongly disagreed that using e-consultation will decrease the time needed for their job responsibilities; conversely, 22% agreed and 18% further agreed that using e-consultation will decrease the time needed for their job responsibilities. A majority of respondents expected to find the use of e-consultation easy, with 42% agreeing and another 26% strongly agreeing. Although 14% of respondents disagreed that e-consultation will improve their practice, 40% agreed that e-consultation will improve their practice, with 26% of respondents strongly agreeing with the statement. Finally, 42% of respondents agree that using e-consultation enhances their effectiveness in the job market.

This study, therefore, highlights the potential of e-consultation to boost efficiency in healthcare and consequently increase productivity or performance. In this view, Robblee (2020) mentioned that e-consultation helps to avoid unnecessary diagnostic or therapeutic interventions, which is achieved through enhanced communication between healthcare establishments and patients. The study also found that e-consultation will improve the practice

of clinicians. The study thus confirms the findings of Kose & Oymak (2019) that a more informed patient, as a result of educational enlightenment on e-health, can interact better with his/her doctor, and this subsequently leads to a better understanding and usage of e-consultation services, resulting in improved quality of healthcare.

Table 42: Safety and Quality

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Using e-consultation will improve the quality of care in my specialty	2	14	24	34	24
Using e-consultation helps reduce the risk of error	2	14	30	32	20
E-consultation is relevant for my job	0	6	24	38	28
The Ministry of Health have good policies regarding e-consultation	8	20	40	22	4
Ministry of Health have good client privacy policy for data	10	12	44	26	6
The Ministry of Health have good policy on software standards for e-consultation	16	16	42	16	8

Source: Field data, 2022

Table 41 shows respondents' views on the safety and quality of e-consultation. The study found that 34% and 24% of respondents agree and strongly agree, respectively, that using e-consultation will improve the quality of care in their specialty. 24% of respondents were neutral, 14% disagreed, and 2% strongly disagreed that using e-consultation will improve the quality of care in their specialty. Additionally, 32% of respondents agree and 20% of respondents strongly agree that using e-consultation helps reduce the risk of error. 30% remain indifferent, while 14% disagreed and 2% strongly disagreed that using e-consultation helps reduce the risk of error.

Furthermore, 28% of respondents strongly agree and another 28% agree that e-consultation is relevant for their job. 24% of respondents remained indifferent, with only 6% in disagreement that e-consultation is relevant for their job. Regarding policies on e-consultation, 20% of respondents disagreed that the ministry has good policies, while 22% agreed and 40% remained indifferent. When it comes to privacy policies of the Ministry of Health, 26% of respondents agreed, and an additional 6% strongly agree that the Ministry of Health has good client privacy policies for data. However, 10% strongly disagree, and 12% disagree that the Ministry has good policies for data privacy. Interestingly, 16% of respondents strongly disagree that the Ministry of Health has good policies on software standards for e-consultation. Also, another 16% were in disagreement, with 46% remaining indifferent that the Ministry of Health has good policies on software standards for e-consultation.

Regarding e-consultation, safety is another significant issue of concern. One of the most common safety concerns is accountability, authorization, and authentication. The study found that using e-consultation will improve the quality of care in the specialty area of clinical staff. This also supports the findings of Itrade (2020) that integrating mobile technology in current

healthcare strategies provides new cost-effective opportunities to deliver quality healthcare and ensure better interaction between professionals and patients. E-consultation was found to have substantially minimized waiting time and enhanced accessibility to top-quality healthcare solutions. This study also affirms the research done by Ruth et al. (2019), which identified a significant effect between the system quality on user satisfaction, service quality on use, service quality on user satisfaction, and user satisfaction on net benefits. Nevertheless, the study found that the Ministry of Health does not have good policies on software standards for e-consultation. This, therefore, affects the usage of the platform, data protection, and privacy of patients' information.

The study thus supports the findings of Kuziemsky et al. (2018) that privacy disclosure has been a significant problem in the medical field. Users worry about not only illegal disclosure but also exposure to their family members with specific diseases, such as mental illness. Hence, increasing access, efficiency, and quality of care to the citizenry by empowering expertise and frontline healthcare workers to be virtually accessible through the use of e-consultation is key to healthy development.

Table 43: Communication, Partnership and Teamwork

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I like to be an early adopter of new technology in my practice	2	6	24	30	36
E-consultation will broaden the scope of services offered	2	8	20	32	36
E-consultation will improve my ability to collaborate with patients and other specialists	3	7	24	22	42
E-consultation makes information sharing easier	2	6	8	30	52

Source: Field data, 2022

Table 42 discusses clinicians' perspectives on how e-consultation enhances communication, partnership, and teamwork. The study found that 36% of respondents strongly agreed they prefer to be early adopters of new technology in their practice. Furthermore, 30% agreed, and 24% were indifferent. However, 6% strongly disagreed that they want to be early adopters of new technology in their practice. Moreover, 36% of respondents strongly agreed, and 32% of respondents agreed that e-consultation would broaden the scope of services offered, with 20% remaining neutral on the statement. Additionally, 42% of respondents strongly agreed that e-consultation would improve their ability to collaborate with patients and other specialists, 22% were in agreement, while 7% disagreed that e-consultation would improve their ability to collaborate with patients and other specialists. Lastly, 52% of respondents strongly agreed that

e-consultation makes information sharing easier. This was supported by 30% of respondents who agreed that e-consultation makes information sharing easier.

The study found that the majority of respondents confirmed that e-consultation would improve their ability to collaborate with patients and other specialists. It also makes information sharing easier. Communication, partnership, and teamwork are key to successful adoption and usage of e-consultation. This finding supports the study by Qi, Cui, Li, & Han (2021), which suggests that providers' communication and listening skills are essential when it comes to e-consultation, as they have a positive association with the level of patient satisfaction. Good communication skills and teamwork on the part of clinicians foster trust in e-consultation (Wan, Zhang, & Yan, 2020). It is therefore revealing that this study confirms; through partnership, patients rely on clinicians based on a guarantee of clinicians' care (Gupta, et al., 2020), individual-focused treatment, and the physician's communication behavior (Berger, et al., 2022; Saha & Beach, 2020).

Table 44: Managing Trust

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Using e-consultation will increase my patients' engagement in managing their health	2	14	32	34	16
E-consultation will increase relationship with my patients	4	20	30	32	12

Source: Field data, 2022

Table 43 describes how e-consultation helps in managing trust among health workers and patients. It was found that 34% of respondents agree that using e-consultation increases patients' engagement in managing their health. Additionally, 16% of respondents strongly agree with this notion, while 32% remained neutral. On the other hand, 14% of respondents disagreed and 2% strongly disagreed. Furthermore, 32% of respondents agreed that e-consultation would increase their relationship with patients. Also, 12% of respondents strongly agreed that e-consultation would enhance their relationship with patients. Meanwhile, 30% of respondents remained indifferent, 20% disagreed with the statement, and 4% strongly disagreed that e-consultation would improve their relationship with patients.

The study emphasizes the importance of trust in e-consultation, as it strengthens the relationship between clinicians and patients. Trust is crucial for maximizing results because it can inspire active involvement in treatment, such as adherence to referrals and uptake of services, including emergencies (Kruk, Gage, Arsenault, Jordan, & Patem, 2018).

Table 45: Challenges

Statement	Mean	SD	Rank
People prefer meeting a doctor physically in his consulting room to e-consultation	3.85	0.04	1
Data protection is an issue of great concern to both staff and patients	3.67	1.02	2
Network connectivity is not secure	3.54	0.07	3
Some patients do not trust the confidentiality of e-consultation	3.27	0.69	4
Patients are resistant to changes in consulting procedures	3.10	0.25	5
Patient privacy can be compromised due to presence of other people around	3.04	0.97	6
There are poor legal and regulatory framework for e-consultation	2.91	1.04	7

Source: Field data, 2022

Table 44 discusses the challenges faced with e-consultation. The study found that "people prefer meeting a doctor physically in his consulting room to e-consultation" was ranked first among all the challenges, with a mean of 3.85 and a standard deviation of 0.04. The second-highest ranked challenge is that "Data protection is an issue of great concern to both staff and patients" (mean=3.67, SD=1.02). The third-ranked challenge is that "Network connectivity is not secure" (Mean=3.54, SD=0.07). The fourth-ranked challenge is that "Some patients do not trust the confidentiality of e-consultation" (Mean=3.27, SD=0.69). Furthermore, the fifth-ranked challenge is that "Patients are resistant to changes in consulting procedures"

(mean=3.10, SD=0.25). The sixth-ranked challenge is that "Patient privacy can be compromised due to the presence of other people around" (mean=3.04, SD=0.97). Finally, the seventh-ranked challenge is that "there are poor legal and regulatory frameworks for e-consultation" (Mean=2.91, SD=1.04).

The study revealed that data protection is an issue of concern. The key barriers to using e-consultation for patients are privacy concerns and the security of their data (Mold, J, Y, & de Lusignan, 2019; Osman, et al., 2019). The growing concern over privacy and data security issues indicates that healthcare providers should strengthen the development of e-consultation information systems. Medical health facilities should be vigilant in preventing inappropriate access, misuse, and disclosure of personal privacy (Hong, Chan, & Thong, 2021). The study, therefore, confirms the findings of Dang, Guo, Guo, & Vogel (2020); when such data are handled improperly, patients may face privacy invasion, negative social stigma, strained family ties, loss of control over medical information, and harassment. The various challenges of privacy, data protection, resistance to change, and poor legal and regulatory frameworks cumulatively result in people building resistance to the use of e-consultation. It is, therefore, not surprising that the top-ranked challenge was that people prefer meeting a doctor physically in their consulting room to e-consultation.

4.4.1 Factor Analysis

In this section, factor analysis was employed to explore the underlying structure of the collected data. Factor analysis is a statistical method used to identify latent factors that explain the observed correlations among variables. Two key assessments, the Kaiser-Meyer-Olkin (KMO)

Measure of Sampling Adequacy and Bartlett's Test of Sphericity, were conducted to determine the appropriateness of factor analysis.

Factor analysis assumes that the observed variables are influenced by underlying latent factors, and these latent factors are responsible for the observed correlations among variables. In this study, an exploratory factor analysis (EFA) was conducted to identify and explore the latent factors within the dataset. EFA allows for the discovery of underlying patterns without preconceived hypotheses about the structure of the data. The decision to perform EFA aligns with the exploratory nature of the study and the goal of identifying and interpreting latent factors within the dataset (Nájera, Abad, & Sorrel, 2023).

4.4.1.1 Kaiser-Meyer-Olkin Measure of Sampling Adequacy

The KMO Measure of Sampling Adequacy assesses whether the data is suitable for factor analysis. A KMO value greater than 0.70 is generally considered acceptable, indicating that there is enough common variance among the variables to proceed with factor analysis (Ansah & Tekpe, 2023). In this study, the KMO value was found to be 0.732, surpassing the recommended threshold and suggesting that the data is adequate for factor analysis.

4.4.1.2 Bartlett's Test of Sphericity

Bartlett's Test of Sphericity evaluates whether there is significant variance in the correlation matrix, indicating whether the variables are interrelated. A significance value less than 0.05 suggests that the correlation matrix is not an identity matrix, supporting the presence of relationships among variables (Sürücü, Yikilmaz, & Maslakçi, 2022) . In the analysis, the Bartlett's Test of Sphericity yielded a highly significant p-value of 0.000, indicating that the correlation matrix is not an identity matrix, justifying the use of factor analysis.

4.4.1.3 Choice of Rotation Method: Varimax

In the subsequent steps of factor analysis, a rotation method was employed to simplify the interpretation of factor loadings. The varimax rotation methodwas chosen, and it aim to

maximize the variance of squared loadings within a factor and, consequently, enhance the interpretability of the factors (Taherdoost, Sahibuddin, & Jalaliyoon, 2022). The decision to use varimax rotation was based on the desire to obtain clearer and more distinct factors.

These statistical procedures contribute to the rigor and validity of the factor analysis, allowing the researcher to uncover meaningful patterns in the data. Also, the choice of EFA and varimax rotation aligns with the exploratory nature of the study and the goal of identifying and interpreting latent factors within the dataset.

Table 46: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.732
Bartlett's Test of Sphericity	Approx. Chi-Square	1123.969
	Df	406
	Sig.	.000

Source: Field data, 2022

From the results, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy value was 0.732. This is greater than 0.70, indicating that there are sufficient items for each factor. It also suggests that the degree of shared information among the variables is high, resulting in a strong partial correlation. Therefore, it is reasonable to conduct factor analysis. The Bartlett's Test of Sphericity shows a significance value of 0.000. Generally, a significant statistical test with a value less than 0.05 indicates that the correlation matrix is not an identity matrix (an identity correlation matrix means that the variables are unrelated and not ideal for factor analysis).

Table 47: Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.486	36.158	36.158	10.161	35.039	35.039	7.642	26.350	26.350
2	4.250	14.654	50.812	3.888	13.409	48.447	3.450	11.895	38.245
3	2.353	8.115	58.927	2.041	7.039	55.486	2.803	9.664	47.909
4	1.631	5.624	64.551	1.303	4.493	59.979	2.770	9.553	57.462
5	1.426	4.917	69.468	1.167	4.023	64.001	1.896	6.540	64.001
6	1.306	4.503	73.971						
7	1.162	4.005	77.976						
8	.974	3.360	81.336						
9	.774	2.668	84.004						
10	.710	2.447	86.450						
11	.602	2.076	88.526						
12	.473	1.631	90.158						
13	.392	1.351	91.509						
14	.375	1.292	92.801						
15	.327	1.128	93.929						
16	.306	1.055	94.984						
17	.288	.992	95.975						

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
18	.211	.727	96.702						
19	.189	.650	97.353						
20	.145	.498	97.851						
21	.141	.487	98.338						
22	.120	.415	98.753						
23	.094	.323	99.077						
24	.081	.278	99.355						
25	.068	.233	99.587						
26	.040	.137	99.725						
27	.038	.130	99.855						
28	.023	.080	99.935						
29	.019	.065	100.000						

Extraction Method: Principal Axis Factoring.   Determinant = 7.804

Source: Field data, 2022

Table 46 has a determinant of 7.804. Since the figure is greater than 0.0001, it implies that collinearity is very low. The Eigenvalues refer to the variance accounted for in terms of the number of "items' worth" of variance each explains. In the table, Factor 1 has an Eigenvalue of 10.486, accounting for 36.158% of the total variance in the data. The percentage of covariation among items accounted for before and after rotation was 35.039% and 26.350%, respectively. The second factor had an Eigenvalue of 4.250, contributing to 14.654% of the total variance.

The percentage of covariation among items accounted for by Factor 2 before and after rotation was 13.409% and 11.895%, respectively.

The third factor had an Eigenvalue of 2.353, accounting for 8.115% of the total variance. The percentage of covariation among items accounted for by Factor 3 before rotation was 7.039%, and after rotation, it was 9.664%. Moreover, Factor 4 had an Eigenvalue of 1.631 and accounted for 5.624% of the total variance in the data. The percentage of covariation among items accounted for before and after rotation was 4.493% and 9.553%, respectively. Under the rotation sum of square loadings, it was found that the four factors contributed to 59.979% before rotation and 57.462% after rotation. The study, therefore, converges the iteration to the first four factors because the remaining factors do not have much effect on the total variance. This is shown in Figure 13.
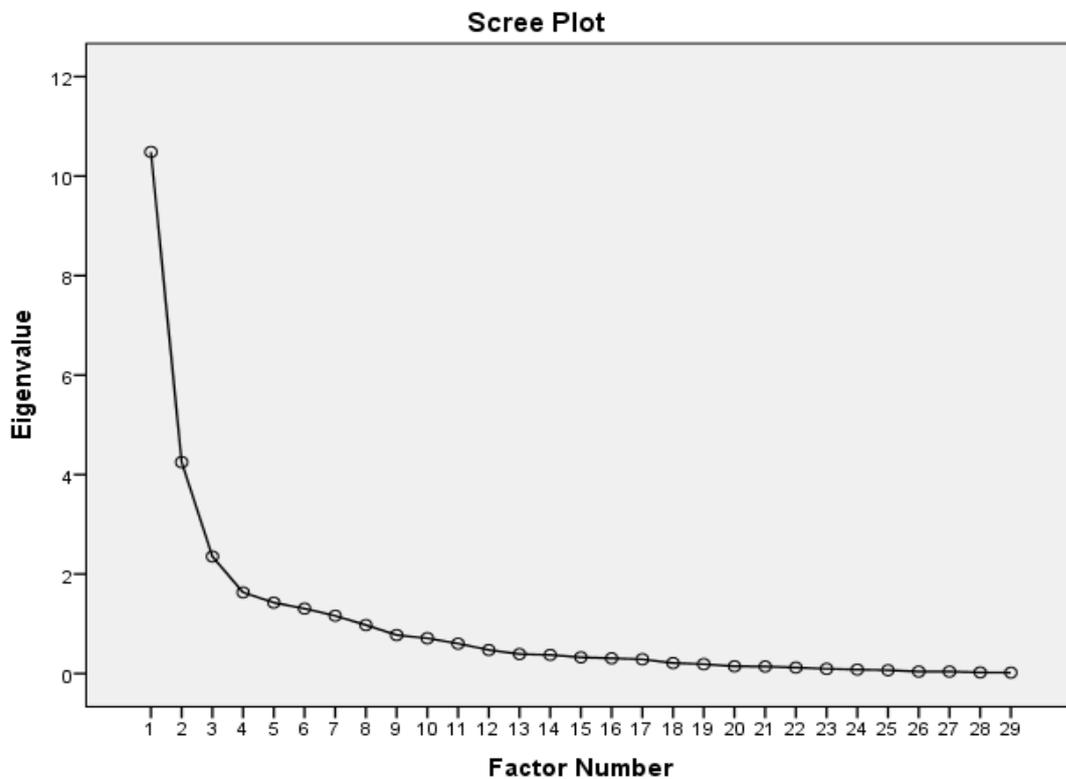
Figure 13: Scree plot

The scree plot of eigenvalues ordered from largest to the smallest helps determine the number of components at the point beyond which the remaining eigenvalues are all relatively small and of comparable size. The scree plot shows the initial eigenvalues, and both the scree plot and the eigenvalues support the conclusion that the 29 factors can be reduced to four components. The scree plot flattens out after the sixth factor. However, the fifth and sixth factors are very poorly defined, relating only to very few factors.

Table 48: Rotated Factor Matrix[a]

	Factor				
	1	2	3	4	5
Knowledge, Skills, Performance [Using e-consultation will increase my productivity]	.928				
Knowledge, Skills, Performance [Using computers will enhance my effectiveness in client care management]	.788				

	Factor				
	1	2	3	4	5
Communication, Partnership and Teamwork [e-consultation will broaden the scope of services offered]	.745				.438
SAFETY AND QUALITY [e-consultation is relevant for my job]	.722				
Knowledge, Skills, Performance [I intend to use e-consultation for client care as often as is needed]	.713				
Knowledge, Skills, Performance [Using e-consultation enhances my effectiveness in my job]	.709				

	Factor				
	1	2	3	4	5
Knowledge, Skills, Performance [e-consultation will improve my practice]	.693				
Knowledge, Skills, Performance [I will spend less time on routine job tasks when using e-consultation]	.687				
Communication, Partnership and Teamwork [e-consultation will improve my ability to collaborate with patients and other specialists]	.651				
Knowledge, Skills, Performance [I expect to find e-consultation easy to use]	.619				

	Factor				
	1	2	3	4	5
SAFETY AND QUALITY [Using e-consultation helps reduce the risk of error]	.511				
SAFETY AND QUALITY [Using e-consultation will improve the quality of care in my specialty]	.510			.405	
Challenges [Data protection is an issue of great concern to both staff and patients]		.844			
Challenges [Some patients do not trust the confidentiality of e-consultation]		.812			
Challenges [Patients are resistant to changes in consulting procedures]		.659			

	Factor				
	1	2	3	4	5
Challenges [There are poor legal and regulatory framework for e-consultation]		.636			
Challenges [Network connectivity is not secure]		.597			
Communication, Partnership and Teamwork [e-consult-ation makes information sharing easier]	.540	.578			
Challenges [People prefer meeting a doctor physically in his consulting room to e-consultation]		.445			

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	Factor				
	1	2	3	4	5
SAFETY AND QUALITY [The Ministry of Health have good policy on software standards for e-consultation]			.864		
SAFETY AND QUALITY [Ministry of Heath have good client privacy policy for data]			.825		
SAFETY AND QUALITY [The Ministry of Health have good policies regarding e-consultation]			.816		
Challenges [Patient privacy can be compromised due to presence of other people around]			-.414		

	Factor				
	1	2	3	4	5
Knowledge, Skills, Performance [Using e-consultation will increase my chances of obtaining promotion]				.814	
Knowledge, Skills, Performance [Using e-consultation will increase my chances of getting in increase in salary]				.735	
Knowledge, Skills, Performance [Using e-consultation decreases the time needed for my job responsibilities]	.421			.695	
Managing Trust [Using e-consultation will increase my patients' engagement in managing their health]					.848

	Factor				
	1	2	3	4	5
Managing Trust [e-consultation will increase relationship with my patients]	.402				.668

Extraction Method: Principal Axis Factoring.

 Rotation Method: Varimax with Kaiser Normalization.

 a. Rotation converged in 6 iterations.

The Rotated Factor Matrix table is crucial for understanding the results of the analysis. Factors are rotated to make them easier to interpret. Rotation aims to achieve a simple structure, where different items are explained or predicted by different underlying factors, and each factor explains more than one item. However, in reality, this is not always achieved. One aspect to examine in the Rotated Matrix of factor loadings is the extent to which simple structure is achieved.

The researcher considered the items grouped together under a factor. From the table, Factor 1 has 13 items grouped under it, relating to knowledge, skills, performance, communication, partnership, teamwork, safety, and quality. It also describes how medical staff adopt and use e-consultation. Factor 1, which demonstrated high internal consistency, was named ***Attitude.*** Furthermore, Factor 2 has seven items grouped together, relating to challenges, communication, partnership, and teamwork. It further portrays trust, network connectivity, data

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protection, legal and regulatory framework, and information. Factor 2 was therefore named *Adoption factors.* Moreover, Factor 3 has four items grouped together, consisting of privacy policy, patient policy, e-consultation policy, and software policy. Factor 3 was consequently named *Policy.* Finally, the fourth factor has three items grouped together, made up of knowledge, skills, and performance. This also defines specific key areas such as promotion, increased salary, and decreased job activity duration. Factor 4 was subsequently named *Benefits.*

4.5 Quantitative Analysis: Patient Perspective
Table 49: Patients' Attitude towards e-consultation

Attitude towards e-consultation	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
I enjoy using computer to find healthcare information on the internet	4	8	29	34	23
I understand what e-consultation entails	9	14	24	35	15
E-consultation reduce my cost of transportation to the hospital	6	16	16	26	35
E-consultation helps me reach out to best consultants	7	13	26	38	15
E-consultation gives me best health services	10	15	34	36	5

Attitude towards e-consultation	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Am okay when clinicians uses e-consultation platforms	5	15	17	39	23
I accept online consultation to physical consultation with consultants	11	19	33	23	12
I feel confident about e-consultation health decisions made by Physicians	8	26	29	24	12
Clinicians using e-consultation for my engagement is entirely my choice	8	14	30	31	15
Interacting with Consultants in an online clinic is good	7	13	24	36	19
I believe e-consultation should be extended to all Hospitals	8	11	25	21	35

Source: Field data, 2022

Table 48 discusses the attitude of patients towards e-consultation. The study observed that respondents enjoy using a computer to find healthcare information on the internet. This statement was agreed upon by 34% of respondents, strongly agreed by 23%, disagreed by 8%, strongly disagreed by 4%, while 29% remained neutral. Furthermore, 35% of respondents agreed that they understand what e-consultation entails, which was further strongly agreed

upon by 15% of respondents. However, 9% of respondents strongly disagreed with this statement. Also, 35% of respondents strongly agreed that e-consultation reduces the cost of transportation to the hospital. This was further agreed upon by 26% of the respondents; however, it was disagreed upon by 16% of the respondents. Moreover, 38% of respondents agreed that e-consultation helps them reach out to the best consultants, though this was disagreed upon by 13% of respondents. Again, respondents agreed (38%) that e-consultation provides them with the best health services; however, this was disagreed upon by 15% of respondents and strongly disagreed upon by 10% of respondents. Notwithstanding, 39% of respondents stated that they were comfortable when clinicians use e-consultation platforms.

Furthermore, 33% of respondents preferred online consultation to physical consultation with consultants, but 19% of respondents disagreed with this fact, and 11% strongly disagreed. Also, 24% of respondents agreed that they feel confident about e-consultation health decisions made by physicians, which was confirmed by 12% of respondents who strongly agreed, but 26% of respondents disagreed that they feel confident about e-consultation health decisions made by physicians. Again, 31% of respondents agreed that clinicians using e-consultation for their engagement is entirely their choice. In addition, 36% of respondents agreed that interacting with consultants in an online clinic is good. This was further strongly agreed upon by 19% of respondents and disagreed upon by 13% of respondents. Finally, 35% of respondents strongly agreed that e-consultation should be extended to all hospitals, while 25% remained indifferent, and 11% disagreed.

When it comes to e-consultation, the attitudes of both medical staff and patients matter significantly. Despite some respondents' dislike for e-consultation, the general views show that

patients have a positive attitude towards e-consultation. The doctor-patient relationship is one of the most complex interpersonal relationships in healthcare. E-consultation systems can either improve or diminish the relationship between the doctor and the patient. According to Rodger et al. (2019), there is overwhelming evidence of doctors' concern regarding the strained relationship with patients due to e-consultation usage. Conversely, this study found that patients are comfortable when clinicians use e-consultation platforms and that it helps them reach out to the best consultants. They also believe that interacting with consultants in an online clinic is good and that e-consultation should be extended to all hospitals. Patients' perspectives on e-consultation have much to do with attitudinal factors that influence their behavior towards this novel technology. As a result, the successful adoption and usage of e-consultation are significantly influenced by the attitudes and perceptions of both clinicians and patients.

Table 50: Challenges

Challenges	Strongly Disagree	SD	RANKING
Data protection is an issue of great concern	3.26	0.77	1
Am concerned about ethical issues on e-consultation	2.76	0.46	2
There are issues on legal and regulatory framework for e-consultation	2.72	0.92	3
During e-consultation, the Privacy of a patient can be compromised due to presence of other people around	2.53	1.12	4
Security on exchange of information, and processing is not well encrypted	2.53	1.06	5
I do not trust the confidentiality of e-consultation	2.31	0.85	6
I do not feel I have been to the Hospital or got medical attention when I use e-consultation	2.18	0.37	7
I have a resistant to new technology, I prefer the old ways of doing things	2.12	0.69	8

Source: Field data, 2022

Table 49 reveals the challenges of using e-consultation as perceived by patients. The challenges were analyzed using the ranking method. It emerged that the highest-ranked challenge was that "Data protection is an issue of great concern" (mean=3.26, SD=0.77). The 2nd highest-ranked challenge, with a mean of 2.76 and SD of 0.46, was that respondents were concerned about ethical issues in e-consultation. The 3rd ranked challenge was that "There are issues with the legal and regulatory framework for e-consultation" (mean=2.72, SD=0.92). Furthermore, the

4th challenge was identified as; "During e-consultation, the privacy of a patient can be compromised due to the presence of other people around" (mean=2.53, SD=1.12). The 5th challenge was that "Security on the exchange of information and processing is not well encrypted" (Mean=2.53, SD=1.06). Also, the 6th challenge was that respondents did not trust the confidentiality of e-consultation (Mean=2.31, SD=0.85). Moreover, the 7th Challenge is that respondents do not feel they have been to the hospital or received medical attention when they use e-consultation (Mean=2.18, SD=0.37).

Finally, the last challenge identified was that respondents have resistance to new technology; they prefer the old ways of doing things (Mean=2.12, SD=0.69). The study confirms the findings of Salisbury, Murphy, & Duncan (2020) that the usage of e-consultation in the United Kingdom is generally very low. Similarly, it brings to light why Adams, Lim, & Huang (2022) discovered that the utilization of e-consultation was low in psychiatric e-consultation. The study also confirms the research of Kesse-Tachi, Asmah & Agbozo (2019) that data privacy, confidentiality, and security concerns are among the factors influencing the adoption of e-consultation in Ghana. Interestingly, the first four challenges of patients with e-consultation were data privacy, regulatory framework, ethical issues, and privacy concerns.

Table 51: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.710
Bartlett's Test of Sphericity	Approx. Chi-Square	1300.894
	Df	171
	Sig.	.000

Source: Field data, 2022

A factor analysis of the collected patient survey data was performed using the Principal Component Analysis (PCA) method of extraction. In the analysis, the Kaiser-Meyer-Olkin (KMO) value was 0.710, and Bartlett's test of sphericity was found to be 1300.894, which is a measure of sampling adequacy. The p-value was 0.000 ($p < 0.05$), suggesting that the strength of the relationships among variables was high. Consequently, it was acceptable to continue with the factor analysis.

Table 52: Total Variance Explained

Factor	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.663	35.067	35.067	4.117	21.667	21.667
2	2.096	11.031	46.098	2.606	13.714	35.380
3	1.839	9.679	55.777	2.606	13.714	49.094
4	1.176	6.192	61.969	2.230	11.736	60.830
5	.967	5.088	67.057	1.183	6.227	67.057

Extraction Method: Principal Axis Factoring.   Source: Field data, 2022

The extraction square loadings resulted in five factors being iterated. Factor 1, with an Eigenvalue of 6.663, had a factor loading of 35.067% of the total variance before rotation and 21.667% after rotation. The second factor had an Eigenvalue of 2.096, resulting in 11.031% of the total variance. The second factor accounted for 11.031% of the total variance before rotation and 13.714% of variance after rotation. The third factor had an Eigenvalue of 1.839, which influenced 9.679% of the total variance and 13.714% of the rotated variance. Finally, the fourth factor had an Eigenvalue of 1.176, which consisted of 6.192% of the total variance before rotation and 11.736% variance after rotation. The four factors accounted for 60.830% of the

total variance, as found under the rotation sums of square loadings. The researcher did not take the fifth factor into consideration because the Eigenvalue was less than 1. This is shown in figure 14.
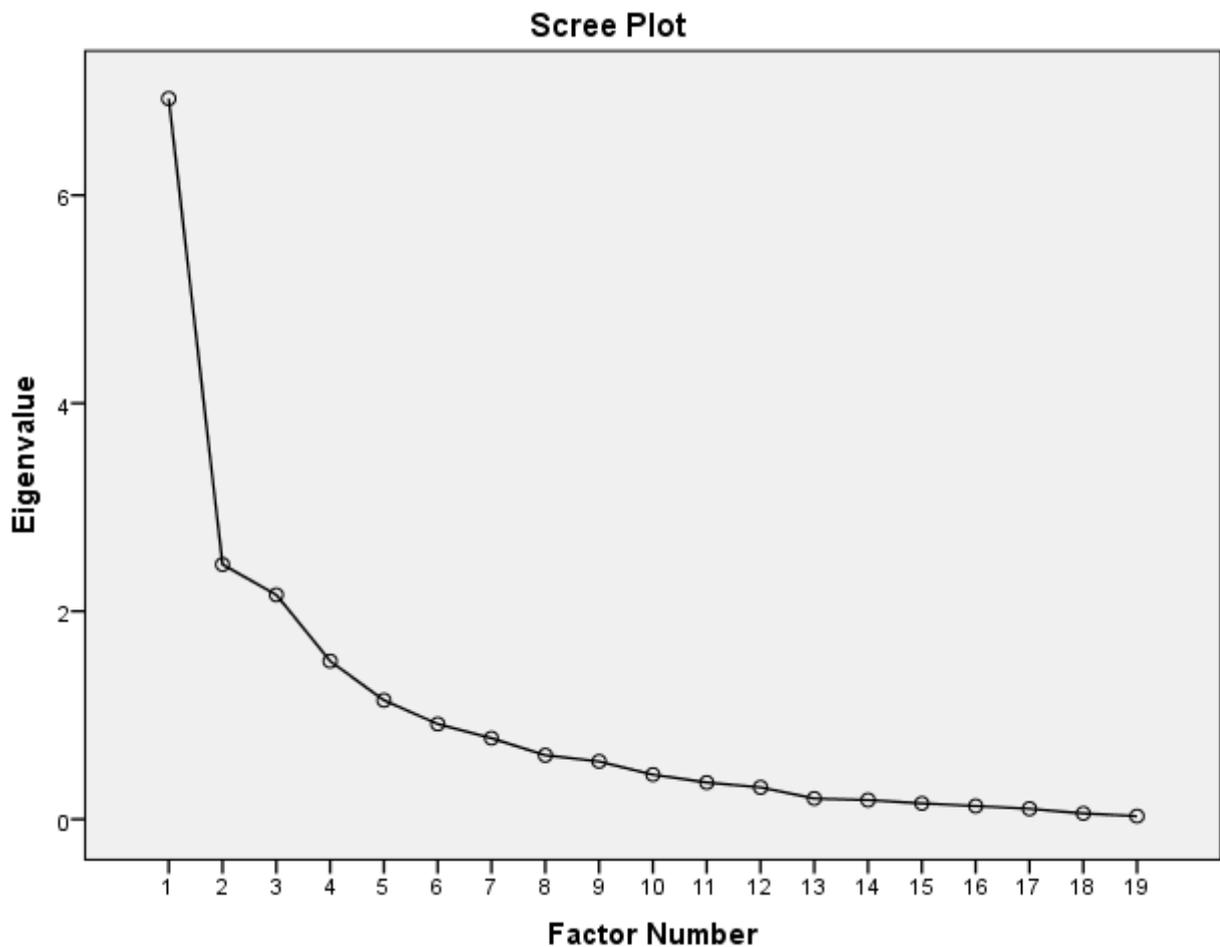
Figure 14: Scree plot – patients perspective

The scree plot displays the Eigenvalues arranged in descending order by size and factors. Factor 1 had the highest Eigenvalue, followed by factor 2, factor 3, and factor 4. Factors 5 through 19 have Eigenvalues less than one, which implies that they seemingly describe only one item. This chart confirms that the researcher should focus on the first four factors in the rotated factor matrix.

Table 53: Rotated Factor Matrix[a]

	Factor				
	1	2	3	4	5
E-consultation [e-consultation gives me best health services]	.834				
E-consultation [I accept online consultation to physical consultation with consultants]	.809				
E-consultation [e-consultation helps me reach out to best consultants]	.796				
E-consultation [Clinicians using E-consultation for my engagement is entirely my choice]	.762				

	Factor				
	1	2	3	4	5
E-consultation [I feel confident about e-consultation health decisions made by Physicians]	.696			.447	
CHALLENGES [I do not trust the confidentiality of e-consultation]		.835			
CHALLENGES [Security on exchange of information, and processing is not well encrypted]	.433	.704			
CHALLENGES [Data protection is an issue of great concern]		.629		.563	
CHALLENGES [Am concerned about ethical issues on e-consultation]		.621			

	Factor				
	1	2	3	4	5
CHALLENGES [There are issues on legal and regulatory framework for e-consultation]		.532			
CHALLENGES [During e-consultation, the Privacy of a patient can be compromised due to presence of other people around]					
E-consultation [I understand what e-consultation entails]			.802		
E-consultation [e-consultation reduce my cost of transportation to the hospital]			.745		
E-consultation [Am okay when clinicians uses e-consultation platforms]	.489		.693		

	Factor				
	1	2	3	4	5
E-consultation [I enjoy using computer to find healthcare information on the internet]			.642		
E-consultation [Interacting with Consultants in an online clinic is good]	.475			.747	
E-consultation [I believe e-consultation should be extended to all Hospitals]	.451			.738	
CHALLENGES [I have a resistant to new technology, I prefer the old ways of doing things]				-.520	
CHALLENGES [I do not feel I have been to the Hospital or got medical attention when I use e-Consult]					.957

Extraction Method: Principal Axis Factoring.   a. Rotation converged in 8 iterations.
Rotation Method: Varimax with Kaiser Normalization.   Source: Field data, 2022

The rotated factor matrix as seen in table 52 was extracted using the Principal Axis Factoring method. The researcher focused on the first four factors, as explained in the previous figure. Factor 1 has six items grouped together, which demonstrate a high level of correlation and consistency among the items. These items describe how patients use, relate to, and feel about e-consultation. Consequently, the researcher named factor 1 as *Attitude.* Factor 2 had five items grouped together, which discuss the challenges associated with e-consultation. It further addresses security, ethical issues, data protection, and legal and regulatory frameworks. The researcher, therefore, named factor 2 as *Regulatory Framework.* Factor 3 had four items grouped together, exhibiting a high level of correlation among the variables. These items further describe awareness, cost reduction, acceptance, and usage. The researcher, therefore, named factor 3 as *Acceptance.* Factor 4 had three items grouped together, which explain e-consultation and its challenges. The items specifically address the acceptance of e-consultation, extension to other hospitals, and non-resistance to new technology (acceptance of new technology). As a result, the researcher named factor 4 as *Diffusion.*

4.6 Proposed Model for E-consultation implementation in Ghana
The development of the proposed model for E-consultation implementation in Ghana is a result of a systematic and comprehensive research process that unfolds through various sections. The introductory section establishes the need for e-consultation in Ghana and identifies a gap in the existing literature. The literature review delves into established theories like the DeLone & McLean IS Success Model and the Diffusion of Innovation model, forming the foundation for understanding critical factors influencing e-consultation implementation.

The research methodology section outlines the approach to data collection and analysis, explaining the rationale behind adopting the chosen models and methodologies. Data analysis and results, spanning sections 4.1 to 4.5, analyze both interview responses and quantitative data to identify significant factors influencing e-consultation implementation. Key themes such as Attitude, Acceptance, Education, Internet connectivity, Diffusion, Benefits, and Regulatory Framework emerge as crucial elements through this analysis.

In section 4.4.1, factor analysis is applied to unravel the underlying structure and relationships among these identified factors. The DeLone & McLean IS Success Model and the Diffusion of Innovation model guide this process, contributing to the conceptual model's formation.

Section 4.6 then presents the final model for E-consultation Implementation in Ghana, integrating the key factors identified throughout the research. This includes Information Quality, System Quality, Service Quality, Internet Connectivity, Education, Diffusion of Innovation, Regulatory Framework, Attitude, Acceptance, and Benefits. The model illustrates the interdependence and influence among these factors, highlighting their role in the successful adoption and usage of e-consultation in the Ghanaian Health Sector.

The conclusion in section 5 summarizes the research's key findings and emphasizes the significance of the proposed model in guiding the successful implementation of e-consultation in Ghana. Each section of the research process contributes to shaping a comprehensive framework that addresses the complexities associated with e-consultation implementation in the Ghanaian context.
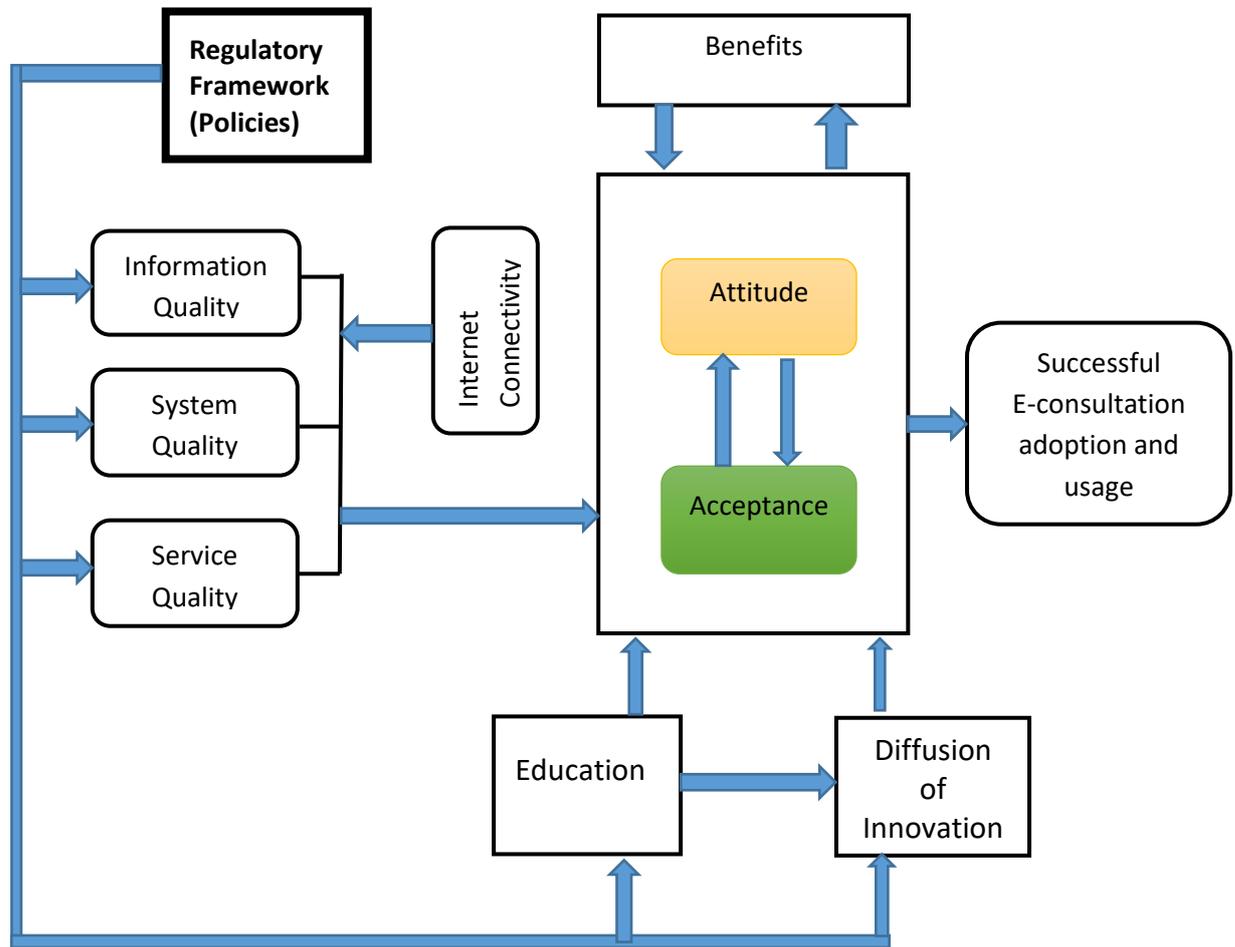
Figure : Model for E-consultation Implementation in Ghana

Source: Authors Construct, 2022

In light of the analysis of results and findings of the study, the researcher proposes a model for

the successful implementation of e-consultation in the Ghanaian Health Sector. The study

adopted the DeLone & McLean updated IS Success Model and the Diffusion of Innovation

model, resulting in a conceptual model. The study noted that paramount among issues raised

by respondents through interviews and confirmed by quantitative analysis, such as the rotated

factor matrix, are Attitude, Acceptance, Education, Internet connectivity, Diffusion, Benefits, and Regulatory Framework (policies).

Information quality, System quality, and Service quality are seen as factors that constitute a good e-consultation platform or system. System quality is defined as the desirable characteristics of the system, while Service quality includes all support offered to users (DeLone & McLean, 2003).

Information quality: The IT service providers create information systems capabilities such as dependability, flexibility, responsiveness, and ease of use. As a result, the end user evaluates the quality of an information system as a type of service provided to them. This relates to content issues and characteristics of the information systems output.

System quality: This measures the desirable characteristics of an information system. System quality is described using characteristics such as perceived ease of use, system features, response time, ease of use associated with hospital information systems, functionality, and flexibility.

Service quality: This involves the interaction between clinical staff and patients. It pertains to the technical support received by patients concerning technical hitches of the e-consultation platform, network infrastructure in place, and system reliability. From the model, Service quality, Information quality, and System quality have a direct influence on patients' attitude and acceptance of e-consultation.

Internet Connectivity: In e-consultation, internet connectivity is the backbone for effective communication between clinicians and patients. The quality of the system, service, and information, as perceived by the user, is based on the strength of the internet connection

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between the clinician and the patient, who are both remotely located. The internet enables remote consultations, where the interaction between physician and patient is completely virtual. Poor connectivity could lead to frustration on both the patient's and doctor's sides.

Education: Much of the adoption and usage of every technology depend on education. Understanding the technology, its uses, and benefits will drive acceptance and usage. Education plays a significant role in enlightening people about the availability of e-consultation, its benefits, and usage. From the diagram, Education has a direct effect on acceptance and attitude toward e-consultation, as well as a direct link with the diffusion of e-consultation.

Diffusion of Innovation: This factor has a direct effect on the acceptance and attitude of users. How well a technology travels is directly correlated with its acceptance and usage. When someone accepts a technology, it automatically changes their attitude toward that technology. Conversely, when people see many others using a type of technology, it influences their perception and acceptability of that technology. The probability of thinking that the technology is good is high because most people are using it.

Regulatory framework: The study found that the Ministry of Health has an E-health Strategy but lacks a framework for the successful implementation of e-consultation. From the model, there is a framework that regulates or concerns system quality, information quality, service quality, Education, and Diffusion of Innovation. The regulatory framework consists of a set of policies on:

a) Information: This consists of the generation, storage, usage, and dissemination of information regarding the development, rollout, and usage of e-consultation by a health facility.

b) System: Policies on accepted requirements for devices and open-source and homegrown software used for e-consultation. Additionally, the policy should address the integration of e-consultation with existing hospital infrastructure systems.

c) Service: Policies on services that can be offered via e-consultation and the extent to which IT staff can support patients remotely.

d) Education: Policies on how the public, patients, and staff should be educated on matters of e-consultation, including the creation of awareness through the media, training of hospital workers, and orientation for patients at various facilities on e-consultation as an alternative mode of seeing a doctor or receiving care.

e) Diffusion of innovation: This involves strategic policies or frameworks that would help foster the adoption and usage of e-consultation by various health facilities and the public.

Attitude and Acceptance: In this study, attitude and acceptance are the core factors for the successful implementation of e-consultation. Acceptance is found to influence users' attitudes, while attitude also influences the acceptance of the technology. Both factors are seen as dependent variables of education, diffusion of innovation, system quality, information quality, service quality, and benefits.

Benefit: Benefit has a direct effect on the acceptance and attitude of e-consultation users. Conversely, anyone who enjoys the benefits of e-consultation will have a positive attitude toward the technology and a high acceptance rate. Moreover, the successful adoption and usage of e-consultation generate numerous benefits for both end-users, as seen from the study.

Finally, the successful adoption and usage of e-consultation are directly dependent on the attitude and acceptance of e-consultation by the public and health practitioners. Furthermore,

the model suggests that the successful adoption and usage of e-consultation would generate significant benefits for the user.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Overview

This chapter summarizes the research undertaken, presents the major findings, and discusses the implications of this study. The researcher's contribution to the area of e-consultation is also highlighted. The chapter provides a conclusion of the study, reveals the limitations of this research, and suggests possible opportunities for further investigation in the future.

5.2 Summary

The researcher carried out this study with the aim of helping improve access to healthcare by identifying the key issues in the use of e-consultation in the Ghanaian Health Sector, evaluating how e-consultation systems influence the delivery of healthcare services in hospitals, and examining how these systems affect people who patronize hospital services. The researcher adopted the updated DeLone & McLean IS Success Model, which consists of six interrelated dimensions of IS success: information, system, and service quality, (intention to) use, user satisfaction, and net benefits. Additionally, the study considered the theory of Diffusion of Innovations, which sought to explain how, why, and at what rate new ideas and technology spread.

This model is widely considered to represent the standard model of technology transfer and is the most appropriate for investigating the adoption of technology. To assess the implementation of a successful e-consultation, the researcher developed a conceptual model that bridged the models of Delone & McLean IS success and the diffusion of innovation to form a suitable model for the study. The study employed the sequential exploratory method to gain an in-depth understanding of the e-consultation phenomenon and develop an e-consultation framework that

enhances acceptability by healthcare workers and the public. The exploratory sequential design interprets how quantitative results build on initial qualitative results (Dawadi, 2021). The study used multiple surveys and interviews to gather data from hospitals within selected geographical regions in Ghana. Examining these various cases helped the researcher compare and contrast the outcomes of the cases to draw logical conclusions. The findings of the study in line with the research questions are presented as follows:

5.2.1 Research Question 1: Why should the attitude of the Public be considered in the implementation of e-consultation?

The attitude of the public is essential in the implementation of e-consultation because it influences the acceptance or rejection of the technology. Attitude towards e-consultation is reflected in how the public perceives the technology and their willingness to use it. The study found that people prefer to avoid the hassle of hospital attendance and the congestion at hospitals.

Despite the interest and acceptance of e-consultation by the public, some people have concerns about data privacy and security. Such concerns make some people hesitant to use e-consultation services because they feel their details might be exposed. Those who do not trust e-consultation security measures tend to dislike using the system. Data security issues are a significant concern for Ghanaians, negatively influencing their attitude towards e-consultation. The study found that some people reject or disassociate themselves from technology due to their inability to understand how it works or how it can be operationalized. Ease of use influences people's attitudes in accepting or becoming familiar with e-consultation. Naturally, people who adopt new technology expect to derive more benefits from using the technology than a traditional approach (Dash and Sahoo, 2021). Invariably, this study discovered that the attitude of the

uneducated towards e-consultation significantly differs from that of the elite. The uneducated often find it challenging to adapt to new technologies and methods. As a result, such individuals might prefer to stick to traditional modes of medical consultation. Overall, the study identified that the general populace has a considerate attitude towards e-consultation. Despite the cautious attitude of a section of the public towards e-consultation, they demonstrate an acceptance of the diffusion of the technology due to the rapid growth and expansion of the digital world. This study found that patients are comfortable when clinicians use e-consultation platforms because it helps them reach out to the best consultants.

5.2.2 Research Question 2: How do the attitude of clinicians and hospital staff affect the implementation of e-consultation in a regular clinical setting?

Clinical staff are essential service providers in the healthcare industry; as a result, their daily activities impact the overall well-being of patients. The study found that a section of clinicians expressed their commitment to the implementation of e-consultation by indicating the number of patients they consult during working hours and off-duty periods. Also, the study discovered that most health facilities did not have a centralized e-consultation system nor a formalized approach to implementing e-consultation. Most health workers relied on available free and open-source platforms for e-consultation services. Consequently, this gives clinical staff mixed feelings towards the use of e-consultation.

The convenience, cost, ease of use, and challenges in diagnosing certain medical cases remotely are some of the factors that influence their attitudes, making them more receptive or indifferent to the use of e-consultation. They see a degree of disparity between traditional methods of consulting and e-consultation due to the difficulty in making diagnoses and addressing patients' issues. Additionally, the study found that some doctors are not comfortable

with e-consultation because they are unable to access patients' history, especially when the doctor has no previous relationship with the patient. Using only e-consultation becomes difficult in such cases. Moreover, clinicians' attitudes towards e-consultation are also influenced by technical factors beyond their control, such as connectivity, power outages, and the continuous supply of data.

The study notes that clinical staff have adopted the usage of e-consultation despite the challenges it presents because e-consultation will improve clinicians' practice. Furthermore, e-consultation helps to avoid unnecessary diagnostic or therapeutic interventions, which are achieved through enhanced communication between healthcare establishments and patients.

5.2.3 Research Question 3: What factors should be considered in e-consultation system development, deployment and usage?

It is imperative to note that the design of Hospital Information Systems, such as e-consultation, should be easy to use, flexible, and functional to serve their purpose. The study found that most medical staff engaging in e-consultation do so freely at their own cost, without receiving any financial benefit or proceeds to defray their mobile data expenses. In addition, some hospital managers do not take e-consultation seriously, adding it to traditional face-to-face consultation because they think it might not generate revenue.

The study discovered that the deployment and usage of e-consultation heavily depend on smooth connectivity between clinicians and patients. Most clinicians are interested in having a fully functioning e-consultation system at various hospitals; however, there are challenges beyond their control. Poor quality connectivity interrupts the smooth flow of e-consultation,

which does not benefit either the physician or the patient. Furthermore, the study noted that the high cost of data does not entice some sections of the populace to utilize e-consultation, especially if it involves video sessions. The study found that data protection is a concern. The key barriers to using e-consultation for patients are privacy concerns and the security of their data. Moreover, the growing concern regarding privacy and data security issues shows that healthcare providers should strengthen the development of e-consultation information systems.

5.2.4 Research Question 4: How does the implementation of e-health technology framework influence the acceptance of e-consultation in Ghana?

The study aimed to determine how the E-Health strategy by the Ministry of Health promotes the implementation and usage of e-consultation in Ghana. The study discovered that the Ministry of Health does not have a specialized policy on e-consultation. Moreover, the current ICT Strategy Framework does not address the concerns of e-consultation from the development stage through implementation to usage. Also, the study found that the Ministry of Health lacks a robust policy on software standards for e-consultation. The poor regulatory framework was a major contributing factor to people building resistance to the use of e-consultation. A good policy is one that can be understood by all who must adhere to it. This requires insight and, more importantly, collaboration across all sectors and stakeholders who would be impacted by the policy. The study found that many health workers were not aware of the existence of an E-Health strategy framework by the Ministry of Health, which calls for a review of the framework to incorporate e-consultation and further education of all stakeholders. Furthermore, education has a direct effect on the acceptance and attitude of people towards e-consultation.

5.3 Contribution to Knowledge

Literature reviews and analyses of the study show that e-consultations account for only a very small fraction of the total consultations conducted in a hospital. Previous studies failed to establish what accounts for the low patronage of e-consultation (Dash & Sahoo, 2021; Salisbury, Murphy, & Duncan, 2020). This research attempted to fill the gap by investigating how the attitude of clinicians and hospital staff affects the implementation of e-consultation. The research established that attitude is the fundamental influencer of people's acceptance or rejection of e-consultation. Attitude towards e-consultation is demonstrated in how the public perceives e-consultation technology and their willingness to use it. For example, the attitude of the uneducated towards e-consultation differs significantly from the attitudes of the elite. The uneducated typically find it challenging to technologically adapt to new ways of doing things.

It is therefore important for the implementers of e-consultation to consider the factors and issues that drive the attitudes of people regarding e-consultation adoption and usage. The study found that the successful implementation of technology is fueled by the relevance of the technology and the attitude of users. Systems, connectivity, infrastructure, information, etc., are all linked to attitude and would become irrelevant to the successful implementation of e-consultation if attitude is not set right. Hence, having systems without the right attitude of users would result in implementation failure.

Research still lags behind the enthusiasm of policymakers, healthcare systems leaders, and others involved in the implementation of e-consult. A framework for e-consultation acceptability would therefore help alleviate these challenges, provide better reassurance to patients about privacy, and incorporate e-consultation as part of a manageable clinical workflow.

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The study brings to light the absence of a policy framework on e-consultation for the Ghanaian health sector. The development, adoption, and usage of e-consultation will progress significantly in Ghana if there is a policy framework because medical staff and the public would be enlightened on its guiding principles and policy direction. Currently, there is not enough evidence to show that regulators foresee the immense benefits that come with e-consultation. Approved policies would enable hospital managers to establish standard e-consultation systems well-integrated into their in-house hospital information management systems. It will also help in providing the right training and mindset for clinical staff, which would eventually result in the delivery of excellent services to patients and their relatives. The study provides empirical evidence as a basis for the Ghanaian Government and the Ministry of Health to promote the adoption and usage of e-consultation, especially for communities without sufficient medical facilities.

Furthermore, this study developed an e-consultation implementation model in the context of the Ghanaian health sector. However, this model can be replicated elsewhere in the world. The study was able to provide a guideline framework for the effective implementation of medical e-consultation across Ghana. The guideline framework can be generalized and applied to any country for which similar circumstances apply. The framework would help inform the development of e-consultation policies, create awareness of the essence of education on e-consultation by hospitals and other stakeholders. The effective adaptation and usage of the e-consultation implementation model will enhance the rate of acceptance and usage of e-consultation by hospitals, other health facilities, and the public in Ghana.

5.4 Conclusion

The study concludes that e-consultation is a technology that is fairly accepted and used in the Ghanaian health sector. The implementation of e-consultation is integrated into the internal hospital management system of very few hospitals. However, most clinicians are accustomed to using e-consultation informally with the help of WhatsApp video, Zoom, phone calls, and other open-source platforms. E-consultation became popular in Ghana during the COVID-19 outbreak; its relevance and enormous benefits make Ghanaians optimistic that the technology would help improve healthcare delivery. The study also concludes that the attitudes of clinicians and patients towards e-consultation adoption and usage are influenced by various factors that range from system quality, information quality, ease of use, connectivity, and education. In all, most people had a positive attitude towards the implementation of e-consultation. Notwithstanding, the lack of a policy framework hinders the rate of diffusion of e-consultation, its adoption, and usage by hospitals and the public. Hence, the proposed model would help regularize the implementation of e-consultation and boost its popularity in the Ghanaian Health Sector.

5.5 Recommendation

The outcome of this research study offers recommendations to the Ministry of Health (MoH) and healthcare facilities in Ghana to support e-consultation as an important and urgent intervention for improving healthcare delivery in Ghana. However, changing the healthcare medium may substantially impact patients' views of different aspects of e-consultation, such as perceived privacy and security, anonymity, trust, and the quality of doctor-patient communication. These factors can have an impact on a patient's desire to participate in e-consultation or otherwise. Hence, the following recommendations would help the implementation of e-consultation in the Ghanaian Health sector.

a) The study identified that most clinicians are not paid for services rendered using e-consultation, especially during off-work hours, because health facilities do not have a structured synchronized system for revenue collection. The researcher, therefore, recommends that health facilities should adopt innovative ways of synchronizing their e-consultation systems with indigenous money payment platforms like Mobile Money or Ghana Pay. This encourages more clinicians to use the technology because they would know that their services rendered would be paid for. Moreover, patients would be able to easily pay for e-consultation services without difficulties.

b) The study revealed that users of e-consultation are sometimes unable to use video mode for communicating with each other due to breakages in transmission. This affects the quality of diagnosis, counseling, and prescription of medication. The study, therefore, suggests that health facilities must deploy e-consultation platforms that have the option of audio and text only, in addition to video consultation. In this way, patients and doctors would have the opportunity to switch over from one mode of e-consultation engagement to another without any challenge.

c) The lack of policy regulation on e-consultation is a significant barrier to the diffusion, acceptance, and usability of e-consultation by the public and clinicians. The study, therefore, recommends that the Ministry of Health and all other stakeholders, like the Ghana Health Services, private hospitals, and the Ministry of Communication and Digitalization, should hold a public health policy stakeholders' engagement at the national level. The development of a policy on e-consultation would promote social acceptability, compliance, and use of e-consultation nationwide.

d) The study identified that lack of education is a deterrent to the adoption and usage of e-consultation. Most hospitals are not able to educate patients on the availability of such modalities for consultation. The study, therefore, recommends that education of the general populace and medical staff be taken seriously. The education of clinicians stands to enhance their digital medical skills in remote consultations. Also, patients would be enlightened on the availability of e-consultation as an alternative mode of medical consultation and encouraged to use the platform.

e) The study also found connectivity to be of great concern. Indeed, having all systems in place for e-consultation and not having efficient and reliable connectivity brings every effort to zero. The study, therefore, recommends that the Government, being the major stakeholder in the Health Sector, should put measures in place to enhance internet connectivity within the country. The Ministry of Communication and Digitalization, and the National Information Technology Agency (NITA) should ensure that fiber optics cabling is networked to every district and town in Ghana. Moreover, telecommunication companies should be engaged to enhance their operations to reduce latency and network breakages.

f) The study discovered that the attitude of both patients and clinicians is central to the successful implementation of e-consultation. The study, therefore, recommends that hospital managers should take keen interest in the attitude of their staff and patients towards e-consultation usage. At best, they should recognize the factors that influence the attitudes of clinicians and staff as identified by the study. This would enhance users' acceptability and usage of e-consultation once it is rolled out by the health facility.

g) The study recommends that the proposed model of e-consultation implementation developed by the study must be adopted by the Ministry of Health. The Ministry of Health, being an authority in the Ghanaian health sector, could ensure that teaching hospitals, regional hospitals, district hospitals, and other healthcare facilities adopt the model for their e-consultation projects. This would also open the door for nationwide e-consultation usage.

h) The study identified significant concerns regarding data security and privacy in the context of e-consultations. To address these concerns, the research proposes the secure transmission and storage of data generated during e-consultation. Currently, Public Key Infrastructure (PKI) is recommended as a method to enhance transmission security, where the sender encrypts data for internet transmission, and the receiver decrypts it upon receipt, preventing unauthorized access during delivery. However, recognizing the dynamic landscape of cybersecurity, the study advocates for a proactive approach. Considering the potential threat posed by quantum computers to traditional cryptographic methods, including PKI, the study suggests exploring and adopting post-quantum cryptographic techniques like lattice-based cryptography or hash-based cryptography. This strategic measure aims to future-proof data security practices in the healthcare sector, aligning with the evolving nature of cybersecurity threats and ensuring the confidentiality and protection of health data against advancements in quantum computing capabilities.

5.6 Limitation of Study

The research method focused on the respondents aged 18 years and above. This naturally excluded the views of minors regarding e-consultation implementation. Hence, the outcome of

the study may not be generalisable for all age groups. Moreover, Ghana has hundreds of health facilities. However, the study did not cover more hospitals due to financial and time constraints. This also may affect the generalisability of the study.

5.7 Future Research

a) The study proposes that future studies should be conducted in the rural areas of Ghana. Exploring the perceptions of potential adopters in villages could shed light on additional factors that are relevant in determining the attitudes, perceptions, and acceptance of e-consultation by rural residents. This would help the Ministry of Health and other hospitals extend health services to the rural communities in Ghana.

b) The study was conducted with respondents aged 18 years and above; the researcher proposes that future studies should be conducted with participants aged below 18 years (children inclusive). This would help unravel the attitudes and challenges involved in the implementation of e-consultation from the perspective of minors (and possibly pediatrics). The study results obtained and those of these studies would provide a broader view and understanding of the perception, acceptability, and usage of e-consultation.

c) The study found that trust, security, and privacy were some of the concerns of respondents. Therefore, the study recommends that future research should assess the extent to which e-consultation is integrated into the internal Hospital Management system framework of hospitals, as well as assess the level of data security protocols set in place.

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Appendix A: Interview Guide

UNIVERSITY OF
KWAZULU-NATAL

INYUVESI
YAKWAZULU-NATALI

FOR CLINICIANS
(Interview Guide)

INTERVIEW GUIDE

ASSESSING THE IMPLEMENTATION OF ELECTRONIC CONSULTATION

IN GHANAIAN HEALTH SECTOR

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

PhD Research Project

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Dear Respondent,

My name is Mark Ofori Nketia, a PhD student in Information Systems & Technology from the School of Management, IT and Governance, University of KwaZulu-Natal.

You are being invited participate in a study assessing the implementation of electronic consultation in Ghanaian Health Sector. The aim and purpose of this research is:

- To investigate factors that influence the adoption of the E-consultation system in Ghana.
- To find out how the implementation of E-consultation technology framework influences its acceptance in Ghana.
- To document the challenges faced by   E-consultation systems in Ghana.
- To offer suggestions to promote the use of E-consultation systems in Ghana.

The duration of your participation if you choose to participate and remain in the study is expected to be less than 15 minutes.

Through your participation I hope determine medical electronic consultation usage in Ghana. The study would contribute to the development of advice for public decision makers by offering a better basis for practitioners and the policy makers involved in the healthcare sector to enhance usage of Information Systems and Technology in the Health Sector for an efficient service delivery. This would also help people to access healthcare remotely. It is also hoped that the outcome of the study would help the Ghana Government and the Ministry of Health to set up more e-health services especially for communities without adequate medical facilities.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee.

In the event of any problems or concerns/questions you may contact the researcher or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001
Durban 4000   KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

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Your participation in the study is voluntary and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequence. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance and your responses will not be used for any purposes outside of this study.

All data, both electronic and hard copy, will be securely stored during the study and archived for 5 years. After this time, all data will be destroyed.

If you have any questions or concerns about participating in the study, please contact me or my research supervisor at the numbers listed above.

Sincerely

(Mark Ofori Nketia)

CONSENT TO PARTICIPATE

I ……………………………………………………… have been informed about the study entitled assessing the implementation of electronic consultation in Ghanaian Health Sector by (provide name of researcher/fieldworker).

- I understand the purpose of the study
- I have been given an opportunity to ask questions about the study and have had answers to my satisfaction.
- I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.
- I have been informed about any available compensation or medical treatment if injury occurs to me as a result of study-related procedures.
- If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (provide details).
- If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001
Durban
4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 - Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview / focus group discussion   YES / NO

_____   _____

Signature of Participant   **Date**

_____   _____

Signature of Witness   **Date**

(Where applicable)

1. Current state of E-consultation technology

    a) What platform do you use for your E-consultation Services?

    b) How many patients do you attend to on Weekly basis by using E-consultation?

    c) Describe your relationship with E-consultation technology?

    d) How do you utilize E-consultation technology in your work?

    e) How common is the use of E-consultation is in health care in your opinion?

2. Motivation for E-consultation use

    a) Do you feel it is important to utilize E-consultation in healt3h care development?

    b) Who gain benefit from the use of E-consultation and how?

    c) What possible downsides or shortfalls E-consultation has?

3. Technology adoption

    a) If you are to adopt E-consultation how would it affect your job?

    b) Do you think E-consultation would affect the patients?

    c) How do you see your colleagues adopting E-consultation?

    d) How would you describe the acceptance of E-consultation by patients?

    e) Do you think we have enough infrastructure such as connectivity, computers, data etc to deal with a system like E-consultation?

    f) Is your current training in computing okay for you to handle E-consultation system?

    g) What factors influence E-consultation technology adoption and development?

    h) What could enhance E-consultation technology adoption?

    i) How much is the adoption influenced by:

        Perceived utility, economic issues, legislation, ease of use or preconceptions towards new technology?

4. E-Health Technology Framework of the Ghana Health Services

    a) Does the Ghana Health Service has an E-health framework?

    b) Are you aware that the GHS has an E-health framework?

c) Are you acquainted with the details?

d) How does the framework promote E-consultation services?

e) How does it encourage Health workers to embrace E-consultation?

f) How does it encourage the general public to embrace E-consultation?

5. Challenges faced by E-consultation usage

a) Are there challenges with E-consultation?

b) What are some of the challenges faced by your patients?

c) What challenges are encountered by medical staff?

d) What other challenges do you envisage in the use of E-Consult?

6. The future of E-consultation

a) What parts in E-consultation are the most crucial to be developed in your opinion?

b) How has COVID-19 influenced the usage of E-consultation?

c) Do you feel that E-consultation technology will change the health care in the future and how?

d) What is the greatest barrier for E-consultation to become more common in health care?

7. Promoting the use of E-consultation in Ghana

a) In your view, what are some of the things that can be done to promote the use of E-consultation in Ghana?

8) Further Comments

a) Is there anything you would want to add?

Appendix B: Questionnaire for Clinicians

FOR CLINICIANS

QUESTIONNAIRE

ASSESSING THE IMPLEMENTATION OF ELECTRONIC CONSULTATION

IN GHANAIAN HEALTH SECTOR

SECTION A: Social Demographic Profile of Respondents

1. Age (Years):

☐ Below 20 years ☐ 20-30 ☐ 31 – 40 ☐ 41 – 50 ☐ 51 – 60 ☐ Above 60

2. Gender: Male ☐ Female ☐

3. How often do you use computer at home?

☐ Everyday ☐ Few time a week ☐ Few time a month ☐ Sometimes

Never

4. Which of the following computer skills do you have? On a scale of 1 to 5, 1 is beginner and 5 is expert, kindly tick your level of skill.

Statement	1	2	3	4	5
Microsoft Office					
Social Media (e.g Facebook, Skype, Twitter etc)					
Computer Troubleshooting					
Email Communication					
Windows Operating System					
Web Browsing					
Data Visualization					

5. How often do you access the internet using the means listed?

Statement	Never	Sometimes	Few times in a month	Few times in a week	Everyday
Own Computer					
Office					
Internet Café					
Mobile device					

If never, please indicate why

……………………………………………………………………………………………….

What kind of internet connection do you have at home?

☐ ISDN

☐ ADSL/DSL

☐ Mobile Phone

☐ Fiber Optics

☐ WLAN

☐ Modem

☐ I do not have a home internet connection

6. For how long have you used an internet chat room application?

☐ Never, ☐ More than a year, ☐ Once a while, ☐ once a month, ☐ weekly, ☐ daily

SECTION B: Please tick the box corresponding to your appropriate choice of answer

Key: 1= Strongly Disagree, **2**= Disagree**, 3**= Neutral, **4**= Agree**, 5** = Strongly Agree

	STATEMENT	1	2	3	4	5
	Knowledge, Skills, Performance					
8	I intend to use E-Consult for client care as often as is needed					

9	Using E-Consult will increase my productivity					
10	I will spend less time on routine job tasks when using E-consultation					
11	Using computers will enhance my effectiveness in client care management					
12	Using E-Consult will increase my chances of obtaining promotion					
13	Using E-Consult will increase my chances of getting in increase in salary					
14	Using E-consult decreases the time needed for my job responsibilities					
15	I expect to find E-Consult easy to use					
16	E-Consult will improve my practice					
17	Using E-Consult enhances my effectiveness in my job					
	SAFETY AND QUALITY					
18	Using E-Consult will improve the quality of care in my specialty					
19	Using E-Consult helps reduce the risk of error					
20	E-Consult is relevant for my job					
21	The Ghana Health Service have good policies regarding E-Consult					
22	Ghana Health Services have good client privacy policy for data					
23	The Ghana Health Services have good policy on software standards for E-Consult					
	Communication, Partnership and Teamwork					

24	I like to be an early adopter of new technology in my practice.					
25	E-Consult will broaden the scope of services offered					
26	E-Consult will improve my ability to collaborate with patients and other specialists					
27	E-Consult makes information sharing easier					
	Managing Trust					
28	Using E consult will increase my patients' engagement in managing their health					
29	E-consult will increase relationship with my patients					
	Challenges					
30	Patient privacy can be compromised due to presence of other people around					
31	Network connectivity is not secure					
32	Data protection is an issue of great concern to both staff and patients					
33	Some patients do not trust the confidentiality of e-consult					
34	Patients are resistant to changes in consulting procedures					
35	There are poor legal and regulatory framework for E-Consult					
36	People prefer meeting a doctor physically in his consulting room to E-consult					

37. For any other Comment, please write below:

_____

Thank You!

Appendix C: Questionnaire for Patients

UNIVERSITY OF
KWAZULU-NATAL

INYUVESI
YAKWAZULU-NATALI

QUESTIONNAIRE

ASSESSING THE IMPLEMENTATION OF ELECTRONIC CONSULTATION

IN GHANAIAN HEALTH SECTOR

SECTION A: Social Demographic Profile of Respondents

7. Age (Years):

☐ Below 20 years ☐ 20-30 ☐ 31 – 40 ☐ 41 – 50 ☐ 51 – 60 ☐ Above 60

8. Gender: Male ☐   Female ☐

9. How often do you use computer at home?

☐ Everyday ☐ Few time a week ☐   Few time a m ☐   Sor☐mes

Never

10. Which of the following computer skills do you have? On a scale of 1 to 5, 1 is beginner and 5 is expert, kindly tick your level of skill.

Statement	1	2	3	4	5
Microsoft Office					
Social Media (e.g Facebook, Skype, Twitter etc)					
Computer Troubleshooting					
Email Communication					
Windows Operating System					
Web Browsing					
Data Visualization					

11. How often do you access the internet using the means listed?

Statement	Never	Sometimes	Few times in a month	Few times in a week	Everyday
Own Computer					
Office					
Internet Café					
Mobile device					

If never, please indicate why

………………………………………………………………..

………………………………………………………………………………………

12. What kind of internet connection do you have at home?

    ☐ ISDN

    ☐ ADSL/DSL

    ☐ Mobile Phone

    ☐ Fiber Optics

    ☐ WLAN

    ☐ Modem

    ☐ I do not have a home internet connection

13. For how long have you used an internet chat room application?

☐ Never, ☐ More than a year, ☐ Once a while, ☐ Once a month, ☐ Weekly, ☐ daily

SECTION B: Please tick the box corresponding to your appropriate choice of answer

Key: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5 = Strongly Agree

	STATEMENT	1	2	3	4	5
1	I enjoy using computer to find healthcare information on the internet					
2	I understand what E-consultation entails					
3	E-consultation reduce my cost of transportation to the hospital					
4	E-consultation helps me reach out to best consultants					
5	E-consultation gives me best health services					
6	Am okay when clinicians uses E-consultation platforms					
7	I accept online consultation to physical consultation with consultants					
8	I feel confident about E-consultation health decisions made by Physicians					
9	Clinicians using E-consultation for my engagement is entirely my choice					
10	Interacting with Consultants in an online clinic is good					
11	I believe E-consultation should be extended to all Hospitals					
	CHALLENGES					
12	During E-consultation, the Privacy of a patient can be compromised due to presence of other people around					
13	Security on exchange of information, and processing is not well encrypted					
14	Data protection is an issue of great concern					
15	I do not trust the confidentiality of e-consult					

16	I have a resistant to new technology, I prefer the old ways of doing things					
17	There are issues on legal and regulatory framework for E-Consult					
18	Am concerned about ethical issues on E-consultation					
19	I do not feel I have been to the Hospital or got medical attention when I use E-Consult					

20. In your view what could be done to promote the use of E-consultation systems in Ghana:

_____

_____

_____

_____

_____

21. For further comments please write below:

_____

_____

_____

_____

_____

_____

Thank You!

Appendix D: Other results

Communalities

	Initial	Extraction
Knowledge, Skills, Performance [I intend to use E-Consult for client care as often as is needed]	.907	.580
Knowledge, Skills, Performance [Using E-Consult will increase my productivity]	.946	.882
Knowledge, Skills, Performance [I will spend less time on routine job tasks when using E-consultation]	.865	.594
Knowledge, Skills, Performance [Using computers will enhance my effectiveness in client care management]	.876	.760
Knowledge, Skills, Performance [Using E-Consult will increase my chances of obtaining promotion]	.849	.782
Knowledge, Skills, Performance [Using E-Consult will increase my chances of getting in increase in salary]	.875	.726
Knowledge, Skills, Performance [Using E-consult decreases the time needed for my job responsibilities]	.840	.664
Knowledge, Skills, Performance [I expect to find E-Consult easy to use]	.803	.458
Knowledge, Skills, Performance [E-Consult will improve my practice]	.908	.617

Knowledge, Skills, Performance [Using E-Consult enhances my effectiveness in my job]	.927	.716
SAFETY AND QUALITY [Using E-Consult will improve the quality of care in my specialty]	.844	.535
SAFETY AND QUALITY [Using E-Consult helps reduce the risk of error]	.729	.450
SAFETY AND QUALITY [E-Consult is relevant for my job]	.793	.601
SAFETY AND QUALITY [The Ghana Health Service have good policies regarding E-Consult]	.915	.734
SAFETY AND QUALITY [Ghana Health Services have good client privacy policy for data]	.855	.752
SAFETY AND QUALITY [The Ghana Health Services have good policy on software standards for E-Consult]	.909	.787
Communication, Partnership and Teamwork [I like to be an early adopter of new technology in my practice.]	.913	.658
Communication, Partnership and Teamwork [E-Consult will broaden the scope of services offered]	.958	.844
Communication, Partnership and Teamwork [E-Consult will improve my ability to collaborate with patients and other specialists]	.896	.691
Communication, Partnership and Teamwork [E-Consult makes information sharing easier]	.905	.719

Managing Trust [Using E consult will increase my patients' engagement in managing their health]	.838	.837
Managing Trust [E-consult will increase relationship with my patients]	.837	.622
Challenges [Patient privacy can be compromised due to presence of other people around]	.708	.335
Challenges [Network connectivity is not secure]	.718	.427
Challenges [Data protection is an issue of great concern to both staff and patients]	.869	.825
Challenges [Some patients do not trust the confidentiality of e-consult]	.848	.717
Challenges [Patients are resistant to changes in consulting procedures]	.849	.558
Challenges [There are poor legal and regulatory framework for E-Consult]	.787	.436
Challenges [People prefer meeting a doctor physically in his consulting room to E-consult]	.759	.251

Extraction Method: Principal Axis Factoring.

Factor Plot in Rotated Factor Space
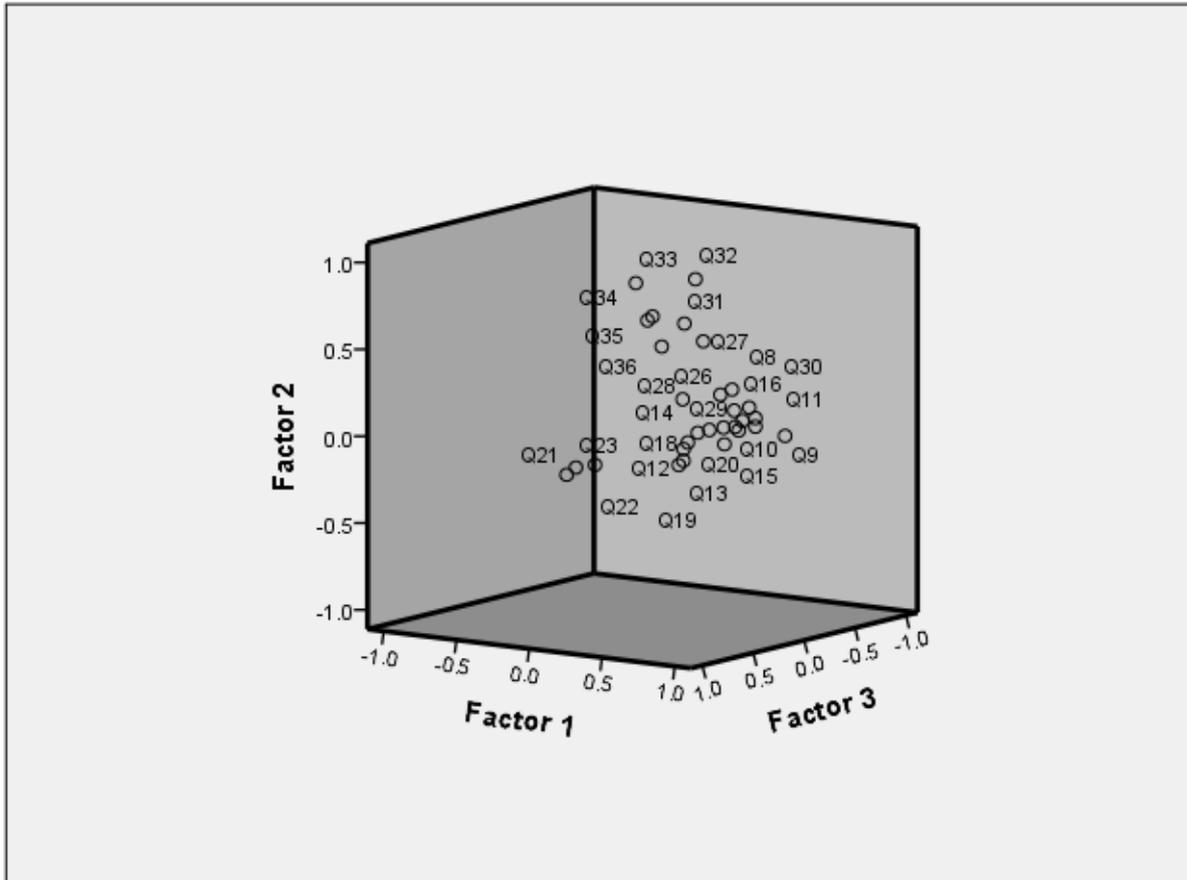
Factor Transformation Matrix

Factor	1	2	3	4	5
1	.847	.205	.157	.380	.266
2	-.001	.785	-.557	-.256	.093
3	-.117	.502	.808	-.260	-.119
4	-.162	.262	-.058	.696	-.646
5	-.492	.146	.098	.488	.699

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Patients View

Communalities

	Extraction
E-consultation [I enjoy using computer to find healthcare information on the internet]	.527
E-consultation [I understand what E-consultation entails]	.703
E-consultation [E-consultation reduce my cost of transportation to the hospital]	.767
E-consultation [E-consultation helps me reach out to best consultants]	.792
E-consultation [E-consultation gives me best health services]	.822
E-consultation [Am okay when clinicians uses E-consultation platforms]	.747
E-consultation [I accept online consultation to physical consultation with consultants]	.739
E-consultation [I feel confident about E-consultation health decisions made by Physicians]	.754
E-consultation [Clinicians using E-consultation for my engagement is entirely my choice]	.706
E-consultation [Interacting with Consultants in an online clinic is good]	.826
E-consultation [I believe E-consultation should be extended to all Hospitals]	.799

CHALLENGES [During E-consultation, the Privacy of a patient can be compromised due to presence of other people around]	.226
CHALLENGES [Security on exchange of information, and processing is not well encrypted]	.693
CHALLENGES [Data protection is an issue of great concern]	.736
CHALLENGES [I do not trust the confidentiality of e-consult]	.728
CHALLENGES [I have a resistant to new technology, I prefer the old ways of doing things]	.314
CHALLENGES [There are issues on legal and regulatory framework for E-Consult]	.469
CHALLENGES [Am concerned about ethical issues on E-consultation]	.412
CHALLENGES [I do not feel I have been to the Hospital or got medical attention when I use E-Consult]	.982

Extraction Method: Principal Axis Factoring.

Text Search Query - Results Preview

ghana , framework , most crucial aspect

yes . There are few challenges

: 21 the first one is

a lot of internet to

them on servers . Talking

when when you talk — about

damaged cable here that affects

fair access to computers . But

infrastructure to support the system

to restart . Sometimes the

would have issues with — internet

is a **connectivity** , and for

hospitals , kind of medium

enough infrastructure — in terms — of

new advances

platform , maybe the network , maybe

are bit of improvements .

We are loosing money — so

So infrastructure wise , if low

So it should work on

have enough infrastructure ,

enough , um ,

have enough — infrastructure — such as

infrastructure that in

a problem , just that

and video . So once

challenge will probably be

especially in terms of

into infrastructure , investing into — the

okay . Because in Ghana

25 : 16

work on — the speed ,

use one mast , then

thing to move is a

we have enough infrastructure like

you know , infrastructure , or logistics

your opinion ? Thus , as in

connectivity

and for **connectivity** you need

barriers , area , internet Okay . Okay ,

because the system we're using

computers , — data

and others to

' — force to deal

? Others to deal

forms , and others

to do to

details and others to

I will shift it to

or even the speed at

the infrastructure . Now , you see

they should also help in

1 Speaker 1 25 : 46

Because even with basic devices ,

, — One moment you have internet

So , if they can now

? I think you mentioned that

and — access and all of

the network should develop

then computer managing goes ,

as , and speed as in

can be strong . So that's

computers data , phones and others

infrastructure , and then maybe creates

also one of the

an — issue . Because I

issues , computers or

is — key . So , people should

not solid because data

sorted , that's the most

very bad . There are

network . Or sometimes the network

okay . Because in Ghana the

or bad connection would interrupt

was one of the greatest

when — , you are interacting with

the Internet is bad .

you need the data . So

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Appendix E: Gate Keepers Permission

KOMFO ANOKYE TEACHING HOSPITAL

RESEARCH AND DEVELOPMENT UNIT (R & D)

CERTIFICATE OF REGISTRATION

REG. NO: RD/CR21/197...

This is to certify that

Prof/Dr/Mrs/Mr/Ms *Mark Ofori Nketia*

has registered his/her proposed study titled *Assessing the Implementation of*

Electronic Consultation in Ghanaian Health Sector.

....

....

To be conducted at the Surgery Directorate.

Date of issue: *22-November-2021*   Date of expiry: *21-November-2022*

Deputy Director for Research

Dr Kwadwo Sarbeng

K20/0532942   *

*Receipt number

304

P. O. Box 1934
Kumasi - Ghana
Tel: +233 - 3200-22301 - 4
Fax: +233 - 3220-24654 / 24621
Website: www.kathhsp.org

Our Ref. No. *KATH IRB/CA/146/21*

Your Ref... No:...

Komfo Anokye Teaching Hospital Institutional Review Board

3rd June 2022

Mr. Mark Ofori Nketia
Office of Research Services and Innovation
Ghana Communication Technology University
Tesano Campus,
Accra.

Dear Mr. Nketiah,

Ethics Approval

Protocol title:	Assessing the Implementation of Electronic Consultation in Ghanaian Health Sector
Study site:	Surgery Directorate of the Komfo Anokye Teaching Hospital
Sponsor:	Self-funded

We write in response to the clarifications and revised documents following review by the Komfo Anokye Teaching Hospital Institutional Review Board (KATH IRB) in respect of the research study referenced above.

We are pleased to inform you that KATH IRB, per your correspondence of 17th May 2022, has given approval for the following study documents:

- *Protocol version 1.3.1 last updated 4th March 2022*
- *Informed consent form, (Patients) version 1.3.1 last updated 4th March 2022*
- *Informed consent form, (Health Workers) version 1.3.1 last updated 4th March 2022*
- *Interview guide (Clinicians) version 1.3.1 last updated 4th March 2022*
- *Case report form (Clinicians) version 1.3.1 last updated 4th March 2022*
- *Case report form (Patients) version 1.3.1 last updated 4th March 2022*

Approval for the study is in effect until **2nd June 2023** and it is the responsibility of the Principal Investigator to maintain the study in good standing at the Komfo Anokye Teaching Hospital. The Board anticipates to be notified of the actual start date of your project.

Page 1 of 2

A Centre of Excellence

Prior to the expiration of the study approval, you must submit to the KATH IRB an "Application for Continuing Review" along with provision of "Annual Report" when the study is ongoing, or a "Termination Report" if the research has been completed.

You must hastily report to the KATH IRB should a modification to the research be proposed, and without delay if an unanticipated development occurs before the next required review. Regulations do not permit you to modify conduct of the study in its present form prior to ethics approval; except where urgent action is required to eliminate an apparent immediate hazard to a study subject or other person. It is of utmost importance data generated from this study must be used for the intended purposes only.

Thank you.

Sincerely
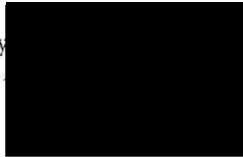
for
Prof. Kwabena Antwi Danso, BSc, MB ChB, FWACS, FGCS, FACOG
Chairman, KATH IRB

NATIONAL CATHOLIC HEALTH SERVICE

Tel   : 233-302-500491/2
Fax   : 233-302-500493
E-mail : admin@nchs.org.gh
Web site: www. nchsgh.org

Health Directorate
National Catholic Secretariat
P. O. Box KA 9712
Airport - Accra
Ghana

IN GOD IS OUR HELP
AND OUR HEALTH

Our Ref: **NCS/DOH/B2/2021/01**

July 08, 2021

Mr. Mark Ofori Nketia
Office of Research Services and Innovation
Ghana Communication Technology University
Tesano Campus
Accra.

Dear Sir,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT SELECTED CATHOLIC HOSPITALS

Your letter dated July 05, 2021 on the above subject refers...

We hereby approve your request to undertake a research study at the National Catholic Health Service (NCHS) facilities. The Service has forty-eight (48) hospitals and eighty (80) clinics located across the country.

Be assured that you would be given the necessary assistance to collect data for your research.

By copy of this letter, we kindly request the Arch/diocesan Executive Secretaries and Directors to assist you to have access to the facilities of interest.

Please note that the NCHS is interested in the outcome of your research and will be happy to receive the findings.

Thank you.

Yours faithfully,

for: DIRECTOR, HEALTH
DR. LAWRENCE OFOSU ADJARE
(CHIEF HEALTH SERVICE ADMINISTRATOR)

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GRAPHIC COMMUNICATIONS GROUP LIMITED
No. 3 Graphic Road, P.O Box GP 742, Accra.
Tel: 0302-684001-10   Fax: 0302-684079025.
E-mail: info@graphic.com.gh   Website: www.graphic.com.gh

20th April, 2021

Mr. Mark Ofori Nketia
Ghana Communication Technology University
Accra

Dear Mr. Nketia,

Re: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT GRAPHIC CLINIC

Your request to conduct research at Graphic clinic is granted subject to your good self complying with all ethical obligations.

You would be required to give advance notice before the data collection commences.

Best wishes in this endeavor.

ficer
T: 0302-684-001/10
M: 024-465-8869
E: Jacqui.barnes@graphic.com.gh

NYAHO
HEALTHCARE LIMITED

July 06, 2021.

Tech & Innovation
Nursing and Midwifery Department.
Medical Department
Customer Experience Department

Dear Manager (s)

RE: PERMISSION TO CONDUCT RESEARCH IN NYAHO

The bearer of this letter, **Mark Ofori Nketia**, a PhD student in Information Systems & Technology from the School of Management, IT and Governance, University of KwaZulu-Natal has requested to conduct a study on *"ASSESSING THE IMPLEMENTATION OF ELECTRONIC CONSULTATION IN GHANAIAN HEALTH SECTOR"* using Nyaho Medical Centre as one of His study sites.

Kindly give Him the necessary assistance in this process.

Yours Sincerely,

Augustine Kumah

(Quality Manager)

Email: akumah@nyahomedical.com

Tel: 0509563509

INTERNATIONAL MARITIME HOSPITAL (GH) LTD

P. O. BOX CO 4297
Community One, Tema - Ghana
Telephone: (233) 0303 - 220030
Email: info@IMaH.com.gh
Website: www.IMaH.com.gh
Main Bankers: United Bank for Africa (Ghana) Limited, Tema Branch

OUR REF: MH/1710/002

30TH JUNE, 2021

MARK OFORI NKETIA
OFFICE OF RESEARCH SERVICES AND INNOVATION
GHANA COMMUNICATION TECHNOLOGY UNIVERSITY
TESANO COMPUS, ACCRA

Dear Sir,

RE: REQUEST TO CONDUCT RESEARCH STUDY

This is to inform you that, your request to conduct research on **"Assessing the Implementation of Electronic Consultation in Ghana Health Sector"**; has been approved subject to your attainment of ethical clearance to conduct the study.

Kindly note that you are to adhere to all protocols pertaining to your study and also ensure you do not exceed your confidential and ethical boundaries.

You are required to officially report at the Administration on your first day of commencement of your research.

We wish you all the best in your research study.

Yours faithfully,
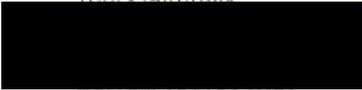
HELLEN TETTEY (DR)
HEAD OF CLINICAL SERVICE
FOR CEO of IMaH

310

Appendix F: Ethical Clerance

19 January 2022

Mark Ofori Nketia (218086175)
School of Management, IT & Governance
Westville Campus

Dear MO Nketia,

Protocol reference number: HSSREC/00003646/2021
Project title: Assessing the implementation of electronic consultation in Ghanaian health sector
Degree: PhD

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 22 November 2021 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 19 January 2023.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

Professor Dipane Hlalele (Chair)

/ms

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Tel: +27 31 260 8350 / 4557 / 3587
Website: http://research.ukzn.ac.za/Research-Ethics/

Founding Campuses: ■ Edgewood   ■ Howard College   ■ Medical School   ■ Pietermaritzburg   ■ Westville

INSPIRING GREATNESS

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