FACTORS INFLUENCING USE OF TELEMEDICINE IN AFRICA: A CASE OF SCHOOL OF MEDICINE UNIVERSITY OF NAIROBI

BY

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DECLARATION

This research project report is my original work and has not been presented for a degree in any other University

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This research project report has been submitted for examination with my approval as the University supervisor.

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DEDICATION

This research report is dedicated to family; my wife Immaculate and daughter Jael (Achi), my mother (Anne Indalo) and long-time friend for her continued support and guidance, my sisters Dorcus and Victoria for their encouragement and support every step of the way during my post-graduate classes and in my research project.

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TABLE OF CONTENT

DECLARATION ..... **ii**

DEDICATION ..... **iii**

ACKNOWLEDGEMENT ..... **iv**

TABLE OF CONTENT ..... **v**

LIST OF FIGURES ..... **ix**

LIST OF TABLES ..... **x**

ABBREVIATIONS ..... **xi**

ABSTRACT ..... **xii**

CHAPTER ONE: INTRODUCTION **1**

1.1 Background of the Study 1
1.2 Statement of the problem 4
1.3 Purpose of the study 5
1.4 Objectives of the study 5
1.5 Research Questions 5
1.6 Significance of the Study 6
1.7 Delimitation of the study 6
1.8 Limitations of the study 7
1.9 Assumptions of the study 7
1.10 Definition of significant terms 7
1.11 Organization of the study 7

CHAPTER TWO: LITERATURE REVIEW **9**

2.1 Introduction 9
2.2 Use of telemedicine in Africa 9
2.3 The Influence of Infrastructure on use of telemedicine 10
2.4 The influence of Technical skills on use of telemedicine 12

2.5 The influence of medical policies on use of telemedicine 16
2.6 The influence of Medical staff attitude on use of telemedicine 19
2.7 Theoretical framework 23
2.8 Conceptual framework 24
2.9 Summary and research gap 25
CHAPTER THREE: RESEARCH METHODOLOGY 27
3.1 Introduction 27
3.2 Research Design 27
3.3 Target Population 27
3.4 Sample size and sampling procedure 28
3.5 Data collection methods 29
3.6 Validity of Data Collection Instruments 30
3.7 Instrument reliability 30
3.8 Data collection procedures 31
3.9 Data Analysis technique 31
3.10 Ethical Considerations 31
3.11 Operationalization of variables 32
CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF RESULTS 33
4.1 Introduction 33
4.2 The Socio demographic characteristics of the respondents 33
4.1 Gender 33
4.2 Age 33
4.3 Staff Position 34
4.3 Technical Skills of the Medical staff and use of telemedicine 34
4.3.1 Cross-tabulation Use of telemedicine and staff position 34
4.3.2 Chi-square Use of telemedicine vs Staff position 35
4.3.3 Telemedicine use vs age 35
4.3.4 Chi-Square frequency of telemedicine use vs age 36
4.3.5 Use of computer for official purposes 37

4.3.6 Use computer for personal use 38
4.3.7 Consider themselves computer literate 38
4.3.8 Use of emails 38
4.3.9 Use of digital camera 39
4.3.10 Computer formal training 39
4.4 Medical policies and use of telemedicine 40
4.4.1 Remuneration of doctors 40
4.4.2 Law and telemedicine 41
4.4.3 Patient information 41
4.5 Infrastructure and use of telemedicine 42
4.5.1 Telemedicine Infrastructure 42
4.5.2 Resources necessary to use telemedicine 42
4.6 Medical staff attitude and use of telemedicine 43
4.6.1 Fear of making mistakes vs hesitation to use telemedicine 43
4.6.2 General acceptance of telemedicine 44
4.6.2.1 Salary increment and hesitation to use telemedicine 45
4.6.2.2 Use of telemedicine/getting salary increment hesitation making fear 45
CHAPTER FIVE: SUMMARY OF FINDINGS, DISCISSION, CONCLUSSION AND RECOMMENDATIONS 47
5.1 Introduction 47
5.2 Summary of findings 47
5.2.1. Summary of findings Medical policies 47
5.2.2. Summary of findings Infrastructure 47
5.2.3. Summary of findings medical staff attitude 48
5.2.4. Summary of findings technical skills 48
5.3 Discussion of findings 49
5.4 Conclusion of the study 50
5.5 Recommendation of the study 50
5.6 Suggestion for further research 51

REFERENCE **52**

Appendix I. Letter of Transmittal 58

Appendix II: Questionnaires 59

LIST OF FIGURES

Figure 1 Technology Acceptance Model 19
Figure 2 Ritzer's integrative (micro-macro) theory of social analysis 24
Figure 3 Conceptual Framework 25

LIST OF TABLES

Table 4. 1 Gender of the Medical Staff....33
Table 4. 2 Age of Medical Staff....33
Table 4. 3 Staff position....34
Table 4. 4 Use of telemedicine and staff position....35
Table 4. 5 Chi-square Use of telemedicine vs Staff position....35
Table 4. 6 Frequency of telemedicine use vs age....36
Table 4. 7 Chi-Square frequency of telemedicine use vs age....36
Table 4. 8 Use of computer....37
Table 4. 9 Computer for personal use....38
Table 4. 10 computer literacy....38
Table 4. 11 Use of emails....39
Table 4. 12 Use of digital camera....39
Table 4. 13 Computer formal Training....40
Table 4. 14 Remuneration of doctors....40
Table 4. 15 Law and telemedicine....41
Table 4. 16 Patient information....41
Table 4. 17 Kenyan Medical policies and telemedicine....41
Table 4. 18 Telemedicine Infrastructure....42
Table 4. 19 Telemedicine resources....43
Table 4. 20 Telemedicine hesitation use against age....44
Table 4. 21 Salary increament against hesitation to use telemedicine....45
Table 4. 22 Chi-square....46

ABBREVIATIONS

ATA	-	American Telemedicine Association
CABECA	-	Capacity Building for Electronic Communication in Africa
ICT	-	Information and Communication Technology
NASA	-	National Aeronautics and Space Administration
MDG	-	Millennium Development Goals
PADIS	-	Pan African Development Information System
RINAF	-	Regional Informatics Network for Africa Project
WHO	-	World Health Organization

ABSTRACT

The purpose of this research project is to establish the factors influencing use of telemedicine in Africa: a case of School of Medicine, University of Nairobi. The School of Medicine, University of Nairobi has a large number of doctors who work as lecturers and mentors to the undergraduate and postgraduate doctors. Considering that medical staff in this school are practising doctors, this study is to confirm if the telemedicine facility available to them has made considerable change in the mode of healthcare delivery. These changes included their ability to reach more patients, better transmittance of patient reports and management of their ever growing work load. This study was guided by the technology acceptance model among others to evaluate how much telemedicine has been accepted by the staff and if so why they continue to use it. The study looked at the factors that influence the use of telemedicine at the School of Medicine and determine what improvements can be made in using the telemedicine. These factors included infrastructure, technical skills, staff attitude, and medical policies. As Africa has the largest disease burden in the world, this study is significant as it seeks to establish how other methods of providing healthcare through the use of telemedicine can be harnessed to improve patient healthcare within the African continent. Descriptive research design was adopted and used on a target population of 198 and a sample size of 131 respondents. Central tendency analysis of the data indicated that age of the medical staff; Number (N)= 79, Mean (M) = 47.9, Median = 51 – 60 years and standard deviation (SD) = 0.788. The dependent variable was strongly related to the independent variables as found out using chi-square medical staff attitude χ^2 (9) = 19.578, $p<0.05$ the younger were not hesitant to use telemedicine irrespective of the outcome, those who use telemedicine frequently were more positive with its availability as from the School of Medicine $\chi^2(9)=34{,}551$, $p<0.05$. The data was analysed using Statistical Package for Social Scientists (SPSS) version 17. Conclusions arrived at after the analysis of the data were as follows most of the older medical staff were hesitant to use telemedicine, efforts put in by the respondents in patient care should be remunerated to improve the use of telemedicine and telemedicine improved how the respondents worked within their departments. Recommendations were the medical Staff should be well introduced to; the level of infrastructure at the School of medicine, the technicians available to guide them in using telemedicine. General medical policies should be reviewed to introduce the remuneration of doctors who give consults using Telemedicine (electronic media) as a way of encouraging the use of the system, there should be a limitation to the kind of patients healthcare that can be given via telemedicine as many of the older doctors were found to be more hesitant in using telemedicine in patient healthcare, during the establishment of new telemedicine infrastructure the medical staff should be consulted so as to allow for the adaptation and use of the equipment, the School of medicine should create workshops and seminars where the medical staff can be trained and introduced in to other forms of telemedicine and more medical staff should be encouraged to use telemedicine as many thought it improved their work.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The American Telemedicine Association (2013) defines telemedicine as "the use of medical information exchanged from one site to another via electronic communications for the health and education of the patient or healthcare provider and for the purpose of patient care." The WHO has stated that with regard to its health-for-all strategy it recommends that the WHO and its member states should: integrate the appropriate use of health telematics in the overall policy and strategy for the attainment of health for all in the 21st century, thus fulfilling the vision of a world in which the benefits of science, technology and public health development are made equitably available to all people everywhere (Craig & Patterson, 2005). Telemedicine is also defined by the World Health Organisation as ― the practice of medical care using interactive audio-visual and data communications including medical care delivery, diagnosis, consultation and treatment, as well as education and the transfer of medical data. It can be used to strengthen and improve the quality and equity of health care services through means of e-learning, knowledge management, disease surveillance, response to epidemics and e-supported resource management (Nwabueze, 2009).

The National Aeronautics and Space Administration (NASA) pioneered the early development of telemedicine in the 1960s when scientists monitored the physiological functions of astronauts from earth (Lemma, 2004). Presently Telemedicine is practised in one of two ways: store and forward or a synchronous approach. In the first approach, patient data, images or sound files are transmitted via e-mail to a specialist who can review the information at a later stage and then send back a diagnosis and/or management plan. In

synchronous or face-to-face Telemedicine the patient consultation occurs in real time using video-conferencing (Jack and Mars, 2008).

Information and Communication Technology (ICT) has the potential to improve equity in underserved rural areas. The World Health Organisation (WHO) has identified Telemedicine as a possible application to strengthen health systems and improve the quality of health care delivery (Nwabueze et al, 2009). These benefits typically include improved patient care such as safety, quality and efficiency as well as providing evidence and data to support clinical practice, research and policy (Pagliari et al 2005).

Factors that will determine the effective implementation of Telemedicine projects are as follows; technology, infrastructure, human and cultural factors: user acceptance, financing, organization and policy and legislation (Broens, Vollenbroek-Hutten, Hermens, van Halteren and Nieuwenhuis, 2007). The global health organizations perspective to telemedicine has set a stage for this process. This includes The WHO Global Observatory for eHealth who went a step further in 2006 and suggested that "eHealth for all by 2015" be added to the Millennium Development Goals (WHO, 2006).

Possible reasons for this can be found in literature which reports several obstacles to the effective implementation of Telemedicine. These include legislation, infrastructure and human or cultural factors. Human factors such as user acceptance of new technology, motivation, support and training of staff must be addressed before Telemedicine can be efficiently implemented (Chetty, 2005; Medecins Sans Frontiers, 2007a).

The Lewin Group (2000) suggested in their report that user acceptance by health care workers was the second biggest threat after the availability of appropriate technology to the successful implementation of Telemedicine. The context into which the new technology is

introduced will influence the perceived value of the technology and the subsequent continued use including the cultural factors and the efficacy of the technology transfer (Nwabueza *et al*, 2009).

Most operational telemedicine services, of which the majority concern diagnosis and clinical management at a distance, are in industrialized countries, especially the USA, Canada, Australia and the UK. Telemedicine also includes tele-education, and distance treatment, e.g. tele-surgery. A survey done in 2005 by Craig and Patterson (2005) identified 52 telemedicine programmes outside the USA, with Canada (10), Australia (9) and the UK (9) being the major contributors. Elsewhere in Europe, Norway has a National Centre for Telemedicine based at Tromsø and both Finland and Russia have functioning telemedicine programmes.

Hong Kong has established programmes in the rehabilitation of older people, and there is a telemedicine service for burns patients in Australia. In South America, Argentina has seen its telemedicine applications collapse. In Africa, the first reported use of modern telemedicine was in 1984, when a diagnosis of Crouzon's syndrome was made via a satellite link using slow scan television transmission between Swaziland and London (Mars, 2013). It is estimated that 1.3% of the world's health care workers are employed in Africa, while 25% of the global disease occur in Africa. The burden of disease on health care services refers to the health care transition in developing countries from communicable diseases (CD) such as malaria, TB and HIV/AIDS to a degenerative or chronic disease (NCD) profile as the population ages. This transition becomes a double burden on health care services in developing countries as provision must be made for both disease profiles (Norman et al 2006). Furthermore the impact of this burden of disease mainly occurs in the productive mid-life period of the population and therefore affects the productivity and economic development of the workforce which contributes to the cycle of poverty (Ghaffar et al, 2006).

1.2 Statement of the problem

One of the great challenges facing humankind in the 21st century is to make high-quality health care available to all. Realizing this vision will be difficult, perhaps impossible, because of the burdens imposed on a growing world population by old and new diseases, rising expectations for health, and socioeconomic conditions that have, if anything, increased disparities in health status between and within countries (Craig & Patterson, 2005). Currently the Kenyan population according to the last census is 2009, there were 6,897 doctors, 31,917 enrolled nurses and 15,948 registered diploma nurses and 2,921 pharmacists registered (Brenda Dogbey, PhD(c), 2012). The Kenyan population as per the last census 2009 is 39.8 million. Thus the ratio of doctors to patients is in 1 doctors for every 5,770 people (1:5,770).

The School of Medicine, University of Nairobi has a large number of doctors who double as lecturers and mentors to the upcoming undergraduate and postgraduate doctors. Considering that medical staff in this school are all practising doctors this study is to confirm if the telemedicine facility available to them has made considerable change in the mode of healthcare delivery, these changes include their ability to reach more patients, better transmittance of patient reports and management of the ever growing work load. The benefits provided by Telemedicine are well documented in literature, but to achieve these, the technology must be accepted by the end users and utilized optimally, the study therefore looks at Davis (1989) model of technology acceptance among others to evaluate how much telemedicine has been accepted by the staff and if so why they continue to use it. Therefore this study tries to determine the factors that may influence the use of telemedicine at the School of Medicine and determine what improvements can be made to improve the use of telemedicine.

This research proposal is therefore aimed at reviewing the use of the Telemedicine and to investigate the different facilitating conditions, which influence the use of acceptance of the technology.

1.3 Purpose of the study

The purpose of this study is to establish the factors that influence use of telemedicine in Africa: a case of School of Medicine - University of Nairobi.

1.4 Objectives of the study

The study shall be guided by the following objectives:

i) To determine influence of infrastructure on the use of telemedicine in Africa : University of Nairobi School of Medicine

ii) To assess how technical skills influence use of telemedicine in Africa: University of Nairobi School of Medicine

iii) Assess how staff attitude influence the use of telemedicine in Africa : University of Nairobi School of Medicine

iv) Assess the influence of medical policies on the use of telemedicine in Africa: University of Nairobi School of Medicine.

1.5 Research Questions

i) How does infrastructure influence the use of telemedicine in Africa: University of Nairobi School of Medicine?

ii) How do technical skills influence the use of telemedicine in Africa: University of Nairobi School of Medicine?

iii) How does staff attitude influence the use of telemedicine in Africa: University of Nairobi School of Medicine?

iv) How do medical policies influence and use of telemedicine in Africa: University of Nairobi School of Medicine?

1.6 Significance of the Study

This study provides information into how often Medical Staff at the School of Medicine use telemedicine, what are the infrastructure problems they have (if any), it also look at the competencies of the doctors in regards to technical skills and finally it look at the policies that are there and whether these policies hinder the use of telemedicine or they encourage the use of the same. This study also tries to determine if the doctors perceive the telemedicine as a means to improve healthcare in Kenya and if the School of Medicine's experienced healthcare providers (staff) can use the telemedicine to improve healthcare.

The findings of this study might be used to help the government, researchers and other healthcare institutions adopt telemedicine as a means to assist in treatment of patients, which in-tern can help in the reduction of the burden of disease in areas with less doctors and improve the quality of life of the Kenyan population.

1.7 Delimitation of the study

The target population of the study was limited to medical staff School of Medicine and not the patients and hospital. The doctors were hard to get considering the busy schedules. This was countered by persistent follow-ups for the questionnaire.

1.8 Limitations of the study

Due to time and financial constraints, it was not possible to sample more than one School of Medicine. This was countered by the persistence and continued following up of the doctors to complete the questionnaires.

1.9 Assumptions of the study

The following assumptions were made; the research will prove to be helpful to the research and medical community, the respondents understood and answered questions correctly and truthfully and questions asked helped influence the behaviour and use of telemedicine to the respondents.

1.10 Definition of significant terms

Infrastructure: the actual system that is or should be in place to facilitate the ease of setting up the teleconference

Medical policies: The rules and regulations that govern teleconference as a function within the institution and the country at large.

Medical Staff: Lecturers at the School of Medicine (Assistant Lecturers, Lecturers, Senior Lecturers, Associate Professors and Professors).

Technical skills Ability to handle the different types of telemedicine equipment and facilities

Telemedicine/ eHealth/tele-health: The use of medical information exchanged from one site to another via electronic communications for the health and education of the patient or healthcare provider and for the purpose of patient care. The electronic media include teleconference, telephones, emails, presentations and phones

1.11 Organization of the study

The study shall be organized into five chapters. Chapter one is focused on the introduction on the background of the study, statement of the problem, purpose of the study, objective, Objectives of the study, research Questions, significance of the Study, limitations of the study, delimitation of the study, assumptions of the study, definition of significant terms and

the organization of the study. Chapter Two looks at the literature review where the different areas of the telemedicine past and present across the globe was looked at this also focuses on the variables and how they have featured. Theoretical framework, Conceptual framework and Summary and research gap are also mentioned in this chapter. Chapter Three reviews the methodology, research design, target population, sample size and sampling procedure, data collection methods, validity of data collection instruments, data analysis technique and finally the operationalization of variables. Chapter four presents the results of the survey it also has the analysis of data and presentation of the information collected in tables with percentages mean, median and chi square. Chapter five contains summary findings, discussion, conclusion and recommendations of the results that have been obtained from the data analysed and the information gathered in chapter four.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews several literature that has been written in regards to the objectives of the study from different parts of the world that use the telemedicine facilities to improve the quality of life and healthcare of the patients. It looks at the following parts; use of telemedicine in Africa, the Influence of Infrastructure on use of telemedicine, the influence of Technical skills on use of telemedicine, the influence of medical policies on use of telemedicine, theoretical framework and the conceptual framework

2.2 Use of telemedicine in Africa

While developing countries are more likely to consider resource issues such as high costs, underdeveloped infrastructure, and lack of technical expertise to be barriers to telemedicine, developed countries are more likely to consider legal issues surrounding patient privacy and confidentiality, competing health system priorities, and a perceived lack of demand to be barriers to telemedicine implementation (WHO, 2010)

Despite its potential, the success rate of telehealth services has been disappointing (Broens 2007). Apart from the obvious waste of equipment and human resources, Yellowlees considers the damage to the reputation of telehealth an even greater expense. The problem is, firstly, that many telehealth services, which proved to be successful in the pilot phase, could not be sustained. Secondly, and an even a greater obstacle, is that many mistakes in the implementation are repeated over and over again, while only a few examples of good practices are replicated (Yellowlees, 2005). Furthermore, telehealth services involve multidisciplinary role players, ranging from a wide variety of healthcare workers and

information and communication technologists, to economists, managers and policy makers (van Dyk, 2014)

Access to digital technologies remains highly unequal globally, and even among the developing countries themselves. The digital divide, simply put, is the gap between those people and communities with high-quality and consistent access to information technology and those without it. Over the last ten years, there have been numerous telemedicine projects and demonstrations in many different sectors, which have been initiated to attempt to provide consultative services to isolated, remote or rural areas while also utilizing different technologies to facilitate educational and administrative activities from a distance (Bowonder, Bansal, & Giridhar, 2005). MOAHI (1999) in his article states that there are disparities in the provision of health care within countries where the health facilities in the urban areas are relatively well off in terms of manpower, other medical facilities, and resources as compared to those in rural areas. In Kenya the average is one doctor per 500 people in Nairobi, compared m to one per 160,000 people in the rural Turkana District.

2.3 The Influence of Infrastructure on use of telemedicine

Infrastructure is considered to be one of the major issues affecting the Developing countries. Currently only 6.7% of households in Africa have Internet access at home, 16.3% of people use the Internet, and fixed broadband penetration is 0.3% (International Telecommunications Union, 2013). Chief among the challenges facing the establishment of electronic networks in Africa is the poor telecommunications infrastructure. “More telephones exist in Marseilles than in the whole of Africa, and in Ghana 60 researchers share one telephone – and it takes 5 years to get another one. Telephones in Tanzania do not work in the rainy season and in Alexandria you may need to dial a number 65 times to get connected” (Addo 1996).

Comparing Africa to other continents its internet penetration is half that of Asia and the Pacific and is the lowest of any developing world region. Web based solutions for patient centric healthcare, a developed World goal, are currently largely irrelevant. In poor communities, people are mostly computer illiterate and few of the over 2000 African languages are available on the Web (Mars, 2013). Putting up the telemedicine infrastructure relies on many factors of which some are the current existing ones, also considering the costs development is relatively high. Telecommunication costs in Africa, when expressed as a percentage of per capita, monthly, gross national product are very high and 14 of the 20 most expensive countries are in Africa (International Telecommunications Union, 2013) and most African countries cannot afford to pay for information which despite falling information technology prices, continues to rise (Zielinski 1995). The value of technology to the development process is generally accepted. In particular, electronic networking is seen as a tool for attacking developmental problems termed as the 7 D's: demography, desertification, drought, dependency, disequilibrium, debt and destabilisation (Adam 1995). The usefulness of international and national disaster response has been demonstrated, but Africa does not as yet have the communications infrastructure nor the medical resources required to employ telemedicine as part of a disaster response strategy (Ferguson et al. 1995).

The reduction in the cost of technology; the role played by international organisations; and the realisation that Africa has to adopt technology or forever be left behind have resulted in improved use of technology (Addo 1996). Writing about the Capacity Building for Electronic Communication in Africa (CABECA) project, Hafkin (1994) notes that due to communications problems experienced by Pan African Development Information System **(**PADIS**)** members as they exchanged information, a realisation was made that the means for rapid and cheap exchange of information in the Africa region had to be found.

There are millions of people in sub-Saharan Africa who live in areas that do not demonstrate the commercial potential for investment in ICT infrastructure in the short to medium term. This results in a lack of access to high impact telemedicine and eHealth initiatives. These people are also likely to live in areas with a lack of health and transport infrastructure, making a trip to the closest hospital a time intensive and expensive journey (European Space Agency, 2008).

RINAF, which stands for the Regional Informatics Network for Africa Project, is a project that was to be implemented in 1996, aimed at bringing Internet connectivity to a number of African countries (Wang 1996). This is one of the telemedicine projects in Africa that has stood the test of time this is due to continued supported by UNESCO's Intergovernmental Information Programme and financed by the Italian and Republic of Korea governments (Commission of the European Communities, 1997). Most of the networking initiatives are supported by donor agencies. This support cannot be ex pected to continue indefinitely, and often when donors withdraw, projects then fail (MOAHI, 1999).

2.4 The influence of Technical skills on use of telemedicine

Many potential telemedicine projects have been hampered by the lack of appropriate telecommunications technology. However, private telecommunications companies and technology manufacturers are willing to produce the low-cost equipment and bandwidth for Telemedicine to promote the industry to become self-sustaining and profitable (Sing, 2003).

Telemedicine equipment is not as reliable as health care workers demand (Cellar et al, 2003). Jack and Mars (2008) recommend that some of the requirements of the technology used for telemedicine should be that it is reliable, of sufficient quality, correctly calibrated and should not fail or compromise patient safety. In a study conducted by Careau, Vincent and Noreau

(2008), Telemedicine was found to be an effective tool to plan patient care in a multidisciplinary team. They reported 2% of trouble shooting time attributed to poor audio quality.

The recommendation was to use the correct equipment and appropriate training of users before making use of the technology. The main limitation of this study however was that it was conducted in a technology friendly environment and only a small amount of video conferencing opportunities were analysed during the study. Similar problems were reported by Styles (2008) in a study where Speech and Audiology therapists were conducting video conferencing sessions. Here 16% of the participants reported communication difficulties because of technical problems. Cellar et al (2003) also reported that half of the participants had transmission glitches during their study. They also argued that for Telemedicine to be adopted beyond a pilot phase it would have to be glitch free in practice.

All of these studies verified that Telemedicine based diagnostics maintained a high professional standard (Holand and Pedersen, 2005). Developed countries spend on average 2-2,5% of their health care budget on ICT. This translates to $55 spent per person in the United States of America. In comparison, Africa will spend $0,75 per person of the health care budget on ICT. The economic evaluation of Telemedicine is not a priority and seldom found in projects. Reasons given for this include the complexity of e-Health, the variety of stakeholders that value different outcomes, inappropriate evaluation methods and the difficulty measuring health benefits achieved through using Telemedicine (Mars, 2010).

The cost of installation of the hardware and infrastructure of Telemedicine is one of the greatest barriers to overcome. One way of achieving this would be to divide the installation into phases as once the technology is operational, the maintenance cost is low (Sing, 2003). Health care technology provides both a microeconomic and macroeconomic impact on health

care. At the microeconomic level the cost of the technology can be calculated making use of formal cost accounting such as price and charges. The impact of the technology itself can be measured making use of comparisons of resource requirements and the outcomes/benefits of the technology such as cost-minimization analysis, cost-effectiveness analysis and cost-benefit analysis. The macroeconomic impact is defined as the impact the technology will have on national health care costs and the effect of technology on resource allocation among different health programs or other sectors of the economy (Mars, 2010).

Telemedicine systems are one of the most important components of the national healthcare information infrastructure and require special attention (Djamasbi, Fruhling, & Loiacono, 2009). Telemedicine requires information and communication infrastructure, the ability to use that infrastructure, a relatively stable supply of electricity and people to maintain and support the infrastructure (Mars, 2013).

Electronic networking has many prerequisites: good telecommunications, availability of the equipment (computers, modems, etc.), and manpower to utilise the technology. It is the lack of these that is at the root of the problems besetting Africa in implementing electronic network (MOAHI, 1999). In a survey done by Schmidt & Stork, 2008 showed that a large number of respondents who do not currently use the Internet identified their lack of computer knowledge as a reason for not using it. In 9 of the 17 countries surveyed, lack of skills was the most commonly cited reason for non-usage of the Internet.

The second important role that the Government could play is in promoting ICTs through investments in ‘intangibles’ such as local training, consulting services, software adaptation, content providers and building the capacity of local importers and suppliers of IT goods and services (Pigato, 2001). Pigato 2001 also states that lack of skills and human resources may

be the greatest barrier for diffusion of ICTs among the poor. Pigato 2001 states that women have a number of relative disadvantages compared to men that inhibit their access to ICTs including the competing demands on their time both as homemakers and workers.

Restrictions on learning within firms include reluctance to change, risk aversion, lack of knowledge and inability to undertake learning processes. Corrective policies are needed in order to promote national technological growth. This is the essence of technology policy: to promote in-firm learning and skill development; to improve the supply of information and skills from markets and institutions; and to coordinate collective learning within and across related industries, or industrial clusters (UNCTAD, 2003).

A basket of factors influence a person's ability to benefit from access and use of the Internet - including skills and the ability to comprehend, use, modify and create Internet content and services. Policy and regulation influence the enabling environment for the development of skills. In Africa, reliable data and fact-based analysis to inform policy in this area have so far been lacking (Schmidt & Stork, 2008).

The primary point of access to the Internet for many people is the Internet Café. Access at work is the main access point in Botswana, Mozambique, Namibia, Tanzania and Uganda. Even in terms of wider access to the Internet, whether at work or at public access points such as cyber cafés, only 15% of adults in the highest scoring country were using the Internet, while in most countries this figure was only between 1% and 6%. Interestingly, of those limited numbers of people who are accessing the Internet, most are doing so at least once a week and in many cases daily (Schmidt & Stork, 2008).

Another problem is that the brain drain and generally low levels of education and literacy have together resulted in a great scarcity of skills and expertise (at all levels, from policy

making down to the end user). Rural areas in particular have limited human resources. Along with the very low pay scales in the African civil service, this is a chronic problem for governments that are continually losing their brightest and most experienced to the private sector (Jensen, 2001).

2.5 The influence of medical policies on use of telemedicine

A report by the WHO on eHealth states that, "African, Eastern Mediterranean, and South-East Asian Regions currently show the lowest rates of national telemedicine policy implementation, but the highest projected growth. These regions may require extra support in the development of telemedicine policies and strategies in the near future (WHO, 2010). The European Region was most advanced in this area, with approximately 40% of responding countries having a national telemedicine policy. By comparison, only 10% to 15% of responding countries in the Eastern Mediterranean, South-East Asian, and African Regions reported having such a policy (WHO, 2010). The WHO documented that 57 African countries, Tanzania included, have a shortage of 2.4 million doctors and nurses (WHO Report, 2006). Additionally, while Africa has 25% of global disease burden, it only has 1.3% of the world's experienced healthcare workers (Naicker et al, 2009) with this current shortage telemedicine is likely to be held with doctors from other countries/continents. Offering patient care over distance and possibly from another country raises issues such as liability, licensure, jurisdiction, quality and continuity of care, confidentiality, data security, consent, authentication and remuneration (Mars, 2013)

Development of policies that will guide both the physicians and the patients in delivering of the telemedicine is an important consideration in that the doctor as an individual will require money for consultation as the patient will receive treatment. Two major concerns of Tanriverdi and Iacono were to reimburse healthcare workers for telehealth consultations and

to open up new patient markets (Tanriverdi and Iacono 1998). The first challenges—, which are interrelated in many respects—that legally hinder the development of telemedicine include issues related to interstate licensing, legal liabilities, and institutional credentialing of physicians (Stanberry, 1998; Turner, 2003).

In fact, cultural and political issues are usually the most important factors limiting the effectiveness of medical and public health relief efforts to disaster stricken areas (Ferguson et al. 1995). Mars in his journal asks, 'does the physician providing a telemedicine consultation from another country have to be licensed to practice in the country of the patient and referring doctor (Mars, 2013)? Have policies been formulated towards this, who will be liable in-case the patient dies and who is the overall physician of the patient?' Malaysian Law requires registration of the international consultant in Malaysia, under penalty of fine and or imprisonment (Laws of Malaysia, Telemedicine 2013). Quality of care can be addressed by the development of discipline specific guidelines for the practice of telemedicine covering clinical, operational, technical and legal and ethical issues (Jack and Mars, 2008). This has been done for tele-psychiatry in South Africa and serves as a model for other disciplines (Chipps et al.. 2012). Regulators see telemedicine as something new, requiring regulation to protect patients and doctors, but may lack insight (Kekana, 2010). In South Africa the Health Professions Council of South Africa has recently stopped a nurse to doctor telephone based telemedicine service, and at the same time condemned aspects of telemedicine as unethical (Peters-Scheepers, 2013).

Tanriverdi and Iacono, 1998 found it crucial to integrate telehealth services into existing organizational structures and to provide institutional support to execute these services. Odedra-Straub reporting on the African regional Workshop on Telematics for Development in 1995 observed that the various networking projects exhibited very little co-operation or co-

ordination (Odedra-Straub, 1995). The University of Virginia's Office of Telemedicine recently received a grant from the U.S. Health Resources and Services Administration to serve as a Mid-Atlantic Telehealth Resource Center covering the District of Columbia and six states: Virginia, Delaware, Kentucky, Maryland, North Carolina and University Hospitals Ibadan and Ile-Ife, Nigeria,. A 2010 Virginia law requires all health insurers, health care subscription plans, and health maintenance organizations (HMOs) to offer coverage for telemedicine services (Maryland Health Concil, 2011).

In 1996, California passed legislation mandating reimbursement for telemedicine services. The legislation recognized telemedicine as a legitimate means to deliver health care services and established that no payer can limit the setting where services are provided (Maryland Health Concil, 2011). Another example is the national telemedicine system in South Africa, which was rolled out in 1999 using Integrated Services Digital Network (ISDN) at 256kbps. The initial applications were tele-radiology, tele-ultrasound, tele-pathology and tele-ophthalmology. In 2003 the Ministry of Health in Zambia set up a National Telemedicine Steering Committee to study and implement telemedicine initiatives in the country (Mupela, Mustard, & Jones, 2011). There are many obstacles not least of which are the shortage of doctors and the unfortunate reality that most telemedicine activities add extra steps into the routine clinical workflow, adding burden to already overworked doctors and nurses (Mars, 2013).

Since the adoption of the eHealth Action Plan in 2004,1 the Commission's role has broadened to include policy support to the deployment of eHealth, supporting better quality, safer and more efficient health systems that empower patients throughout the EU (Palmer, Steffen, Iakovidis, & Giorgio, 2009). The right of establishment for health professionals exercising telemedicine, accreditation and authorisation schemes to provide telemedicine

services, as well as issues on liability, the recognition of professional qualifications or protection of personal data related to health, are among the areas which require legal clarity, both at EU and national level (Palmer et al., 2009).

2.6 The influence of Medical staff attitude on use of telemedicine

Technology Acceptance Model (Davis 1989) suggests that an individual's intention to use a technology is influenced by his or her attitude towards that technology and his or her perception of its usefulness. Attitude in turn is influenced by a person's beliefs (perceptions) in how useful the technology is and how easy it is to use. The perception of ease of use is measured by the degree to which using a technology is free of effort and the perception of usefulness is measured by the degree to which the technology can help to improve task performance (Djamasbi et al., 2009).

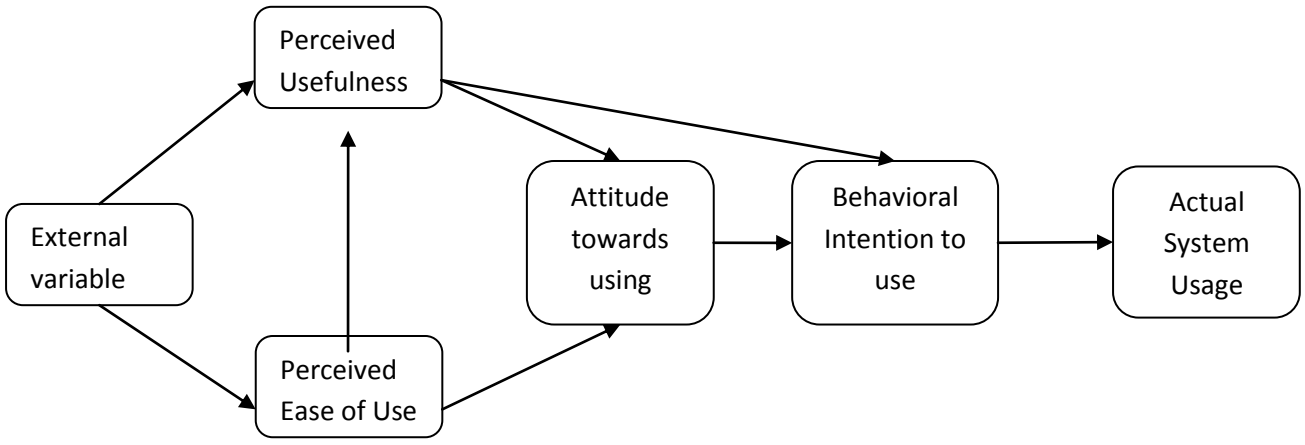

Figure 1 Technology Acceptance Model

Hjelm (2005) found various different human and cultural factors associated with the user acceptance of Telemedicine. These factors include the perceived threat to the role and status

of health care workers; fear that Telemedicine will increase the workload of health care workers; fear of being obsolete if technology advances and cultural differences. Another possible barrier when introducing new technology into an established routine is resistance to change. Health care workers may resist these changes as they may construe that there is something wrong with the existing level of care while they often feel that they are providing the best care possible (Whitten and Love, 2005).

Human factors such as fear that it will increase the workload of health care workers resistance to change: user acceptance of new technology motivation, support and training of staff must be addressed before Telemedicine can be efficiently implemented (Chetty, 2005). Education can be provided in various forms including continuing distance education, community health education for the public such as hygiene and family planning as well as medical information exchange between health care workers (Lemma, 2004). The advantages of education apply to both health care workers in the rural and urban areas. Many teaching hospitals in the developed world have reported a redistribution of skills as they can use the case studies at developing world hospitals to teach students about pathologies they may never encounter in their own countries. In the same way the health care workers in rural areas are supported and provided with new skills making use of Telemedicine as the teaching medium (Heinzelman et al, 2005).

A system that is not readily accepted by its users is less likely to be utilized effectively (Turoff, Chumer, and Van de Walle 2004; Keil, Beranek, and Onsynski 1995). Thus, the ultimate success of healthcare information systems, such as those used in laboratories, requires the acceptance of its users (Perednia and Allen 1995). The approach of "if you put it in place they will use it" highlights the lack of understanding of the human, management and cultural factors that need to be resolved for successful change management and technology

adoption (Mars, 2010). Djamasbi, et al 2009, state that examining factors that can improve or diminish users' attitudes toward the acceptance of a healthcare information system is an important research stream both for theoreticians and practitioners.

A key problem restricting the use of telemedicine is that there is very little information on how using this healthcare network system specifically changes the attitudes of healthcare providers (Hanson et al.. 2009). Tanriverdi and Iacono found it crucial to integrate telehealth services into existing organizational structures and to provide institutional support to execute these services (Tanriverdi and Iacono 1998). Many reasons may be adduced from this lack of collaboration. It may result from genuine lack of knowledge of other initiatives, or a belief that nothing can be learnt from the experience of others. Otherwise the funding agencies may be playing 'turf wars' to maintain individuality" (Odedra-Straub 1995).

The biggest problem cited however is cultural. "The problem with introducing electronic systems is 10% technical, and 90% culture" (Kale 1994) Most health workers are simply not ready to acquire material electronically. A large part of the problem is that these projects are initiated by development agencies that expect their ideas to be embraced wholesale. However participants in these projects need to be involved from the beginning to feel 'ownership' of the project, thus fostering the likelihood of acceptance and diffusion (MOAHI, 1999).

However, regardless of the potential advantages, underutilized technologies will not effectively achieve their intended purpose and the scarce medical resources supporting these systems will be wasted (Markus and Keil 1994; Mathieson 1991). While user acceptance of a technology has been extensively studied in the information systems (IS) literature, there is evidence that healthcare systems may require new acceptance models or at a minimum may require tailoring the existing models to match their needs (Hu, Chau, Sheng, and Tam 1999).

Research has also shown that one of the essential reasons why telemedicine, a specialized type of healthcare information system, has yet to reach its potential is that the attitudes of healthcare professionals are not given enough consideration (Diener, Mueller, and Fletcher 2001; Grigsby, Kaehny, Sandberg, and Schlenker 1995). Two recent investigations provide evidence that healthcare professionals' attitude plays a significant role in acceptance of a healthcare information system (Pare, Sicotte, and Jacques 2006; Hu, Chau, Sheng, and Tam 1999). Literature suggests that attitudes may be influenced by affect (Isen 2003). This is because dopamine receptors in brain can change in response to stimuli such as one's affective states (Djamasbi et al., 2009). Specifically, our results indicate that users' positive affect and their perception of usefulness of the system have almost the same influence on their attitudes toward the system, which in turn has a significant influence on their acceptance behaviour (Djamasbi et al., 2009)

Another possible explanation for the lack of influence of ease of use on attitude in our model is that certain user characteristics may influence the acceptance behaviour Similar to our results, (Hu, Chau, Sheng, and Tam 1999) found that physician's perception of usefulness is not influenced by their perception of ease of use. To explain their results they argue that as pragmatic users, physicians have to be convinced that a technology is helpful before they adopt it. Public health decisions, by definition, require pragmatic decision makers (Djamasbi et al., 2009). The large effect size found for the combined effect of attitude and perceived usefulness on intention to use show that paying attention to these two factors is particularly important in the adoption of healthcare information systems. The effect size of affect and usefulness on attitude was also Large (Djamasbi, 2009).

There is evidence that being familiar with the process of using a particular system and being actively involved in building a model, can improve users' affect (Kahai, Solieri, and Felo

1998). In other words, these findings together with the results of this study suggest that involving users in development of a system is not only another way to foster positive affect in an organization but also another method to improve users' attitude toward the system. This is because users who were involved in the development of a system are more likely to experience positive affect when the system is being introduced (Djamasbi et al., 2009). In summary, the results of this study have significant theoretical and practical implications for both researchers and the practitioners in the healthcare field. The results provide additional support that attitude is a key factor in acceptance behaviour of a healthcare information system (Djamasbi et al., 2009). Education can significantly improve the adoption of new processes and services (Bandiera and Rasul 2006).

Health professionals, physicians, professional nurses and community health workers need to be trained to incorporate telemedicine and eHealth into their day-to-day activities. They will need to understand the benefits to patients, the required skills to access technology and the role that they will play in the system. Importantly, health professionals need to accept the rationale for using the telemedicine and eHealth interventions, especially where their involvement is crucial in areas such as expert advice and professional networking (European Space Agency, 2008). Attitudes towards computer use have been investigated extensively. Both computer anxiety and computer experience are negatively related to end-user acceptance (Laguna and Bobcock 1997). Individual characteristics such as old age tend to correlate with unfavourable attitudes toward computer use. The effects of individual characteristics may be indirect (Dyck and Smither 1994).

2.7 Theoretical framework

Ritzer's integrative (micro-macro) theory of social analysis (2001), states that the microscopic–macroscopic dimension relates to the magnitude of social phenomena ranging

from whole societies (or even more macroscopic world systems) to the social acts of individuals, whereas the objective–subjective dimension refers to whether the phenomenon has a real material existence (e.g. bureaucracy, patterns of interaction) or exists only in the realm of ideas and knowledge (e.g. norms and values). The Macro objective and subjective in this case are the major laws that have been created by institutions and government how they influence the behaviour of the people at an individual level. The Micro subjective and objective influences the individuals at a lower and more personal level. Therefore this theory was most appropriate because it mainly focused on attitude and the factors that influence it, both in the low and higher levels of decision making.

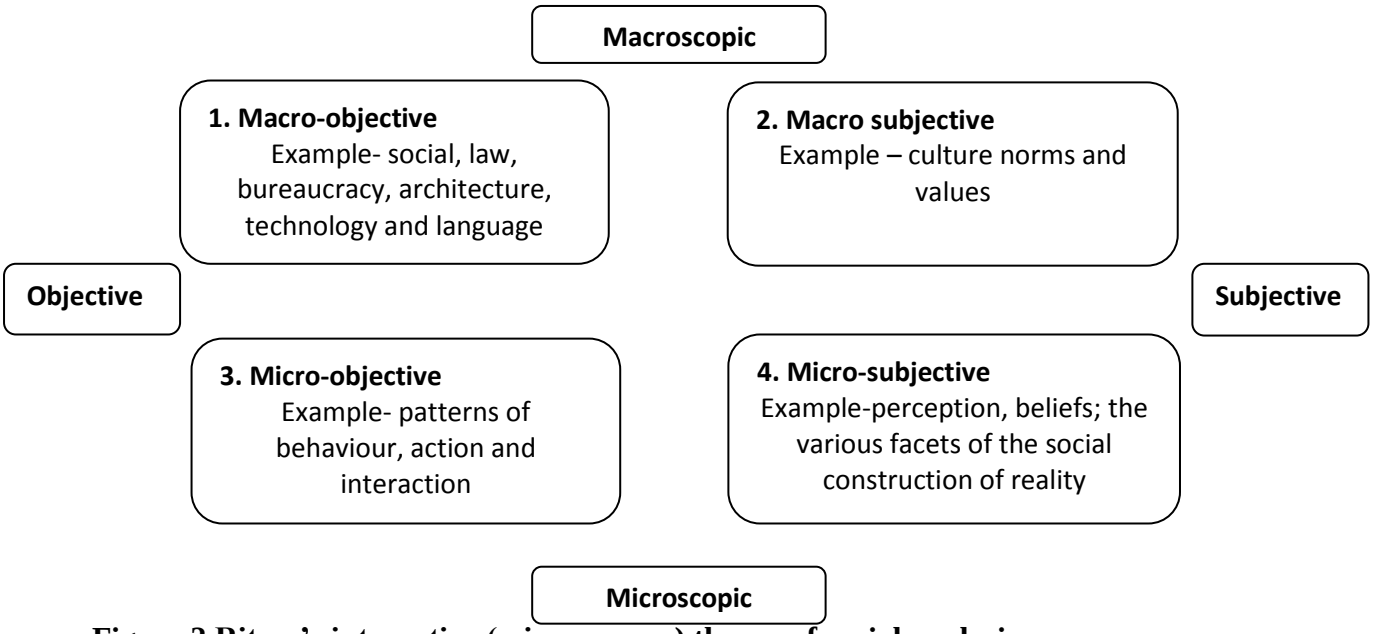

Figure 2 Ritzer's integrative (micro-macro) theory of social analysis

2.8 Conceptual framework

A conceptual framework is *conceptual framework* as a network, or of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena (Jabareen, 2009). The conceptual framework in Figure 3 show how the setting up of telemedicine in an African setting is affected by infrastructure, technical skills, policies and

institutions and attitude of the Medical Staff looking on both the dependent and independent variable. For the relationship to work there has to be both moderating variables (ethics) and intervening variables (doctors relationship) in place.

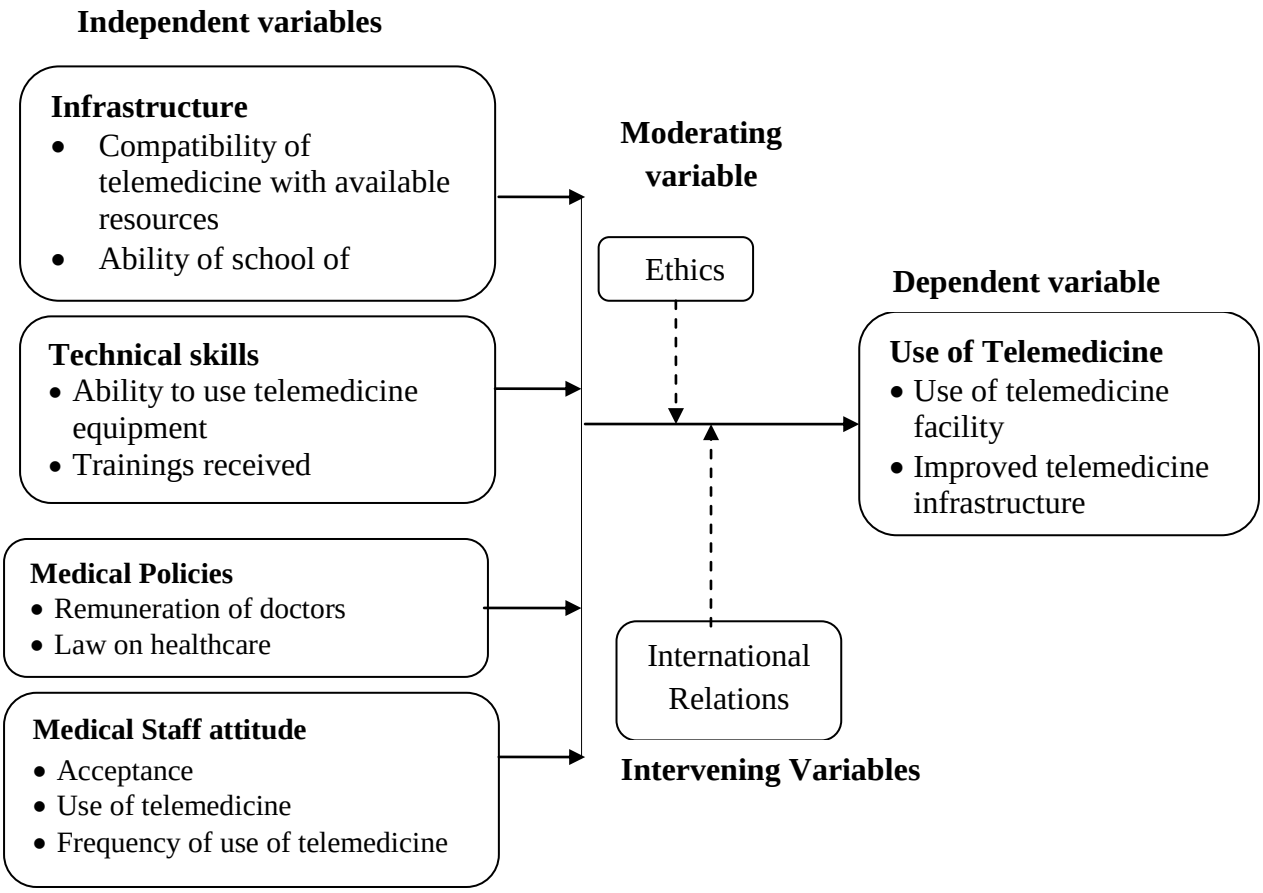

Figure 2 Conceptual Framework

2.9 Summary and research gap

The average ratio of physicians per 100,000 people in sub-Saharan Africa (SSA) was a eager 15.5, compared to an average of 311.0 in nine selected industrialized countries (Liese & Dussault, 2004). The WHO Global Observatory for eHealth went a step further in 2006 and suggested that "eHealth for all by 2015" be added to the Millennium Development Goals (WHO, 2006). This chapter looks at the four different variables and their connection to the telemedicine in different countries in the world.

The School of Medicine University of Nairobi has the capacity to create a better healthcare system as most of the lecturers/staff are practicing doctors and consultants in most of the national healthcare facilities in the country. The literature review shows that various institutions have adopted telemedicine both in Africa and mostly in the developed countries, i.e. this includes how it was adopted and the ones that have failed along the way. Since the factors influence the use of the telemedicine at the school of medicine has not been researched on this is a good opportunity to document the availability of telemedicine at the School and its importance. It also tries to get the views of the various members of staff on the improvement the availability of telemedicine has brought to the healthcare system at large, this is in regards to its use by the said staff.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research design applied; target population, sampling procedure, data collection procedure, research instrument, validity and reliability was adopted in the study. It also discuss the operation definition of the variables data analysis procedures and ethical consideration.

3.2 Research Design

The study adopted a descriptive survey design to investigate factors influencing the use of telemedicine in Africa: A case of School of Medicine. The survey is one of the most commonly used methods of descriptive research in behavioural science. It enabled researchers to gather data from a relatively large number of cases at a particular time (Mugenda and Mugenda, 1999). The descriptive survey research design was the most appropriate in carrying out this study as its aim was to gather extensive information from respondents regarding there day to day activities within the healthcare institutions.

3.3 Target Population

Mugenda and Mugenda (2003), refers to population as an entire group of individuals, events or objectives having a common observable characteristic. The target population was the medical staff at the School of Medicine University of Nairobi. The total number of staff at the School of Medicine University of Nairobi are 198. The target population (medical Staff) are involved directly at the Kenyatta National Hospital as healthcare providers and are in contact

with the patients and students both post and undergraduate during practical sessions and ward rounds. This population is comprised of doctors from different departments

3.4 Sample size and sampling procedure

Sample size according to Mugenda (2008) determines the precision with which population values can be estimated. Mugenda and Mugenda (2003) states that in social science research, the following formula can be used to determine the sample size. The size of the samples will be calculated using the following formula (Daniel, 1999):

$$n = \frac{Z^2 p(1-p)}{d^2}$$

$$n = \frac{(1.96)^2 \ (0.5)(1-0.5)}{(0.05)^2}$$

$$n = 384$$

Where:

n = the desired sample size (if the target population is greater that 10,000)

z = the standard normal deviation at the required confidence level (1.96).

p = the population in the target population estimated to have characterised being measured 50% (0.5).

d = the level of statistical significance set (0.05).

Mugenda and Mugenda (2003) states that if the target population is less than 10,000 the required sample size will be smaller. In such cases the sample estimate using the following formula:

$$n_f = \frac{n}{1+\frac{n}{N}}$$

$$n_f = \frac{384}{1+\frac{384}{198}}$$

$$n_f = \frac{384}{2.94} = 130.6$$

$$n_f = 131$$

Where:

n_f = the desired sample size (where the population is less than 10,000)

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

N = the estimated population size

Convenient sampling was used in collecting the date. Mugenda and Mugenda (2003) states this technique involves selecting cases or units of observation as they become available to the researcher. They also define sampling as a process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected. The number of respondents for this study was 131.

3.5 Data collection methods

Borg and Gall (1996) state that questionnaires are appropriate for studies since they collect information that is not directly observed as they inquire about feeling, motivation attitude accomplishments as well as experiences of individuals. The instrument of data collection was a structured questionnaire that was developed and adopted from various studies that have

been carried out by Davis (1989) on Technology Acceptance. The questionnaires were distributed to the medical staff as they availed themselves during the process. .

3.6 Validity of Data Collection Instruments

Joppe (2000) states that validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Researchers generally determine validity by asking a series of questions, and will often look for the answers in the research of others.

Construct validity is a measure of the degree to which data obtained from an instrument meaningfully reflect or represents a theoretical concept (Mugenda and Mugenda 1999). Validity refers to the degree to which a test or other measuring devices is truly measuring that it was intended to measure. In this study the tool (questionnaires) was reviewed by medical Staff and coordination of the supervisor then pretested to ensure internal validity.

3.7 Instrument reliability

Joppe (2000) also states that reliability is the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable.

According to Mugenda and Mugenda (2003) in a pilot study the researchers analyze the few questionnaires to see of the method of analysis are appropriate.

In this study the adoption of Davis (1989) questionnaires on acceptance of technology was used.

3.8 Data collection procedures

The questionnaires were distributed by a selected number of undergraduate students from the College of health Sciences. They were in charge of the distribution and collection of the questionnaires within a given time period.

3.9 Data Analysis technique

Data was analysed using descriptive statistics which include measures of central tendency. Mugenda and Mugenda (2003) states that chi-square us a statistical techniques which attempts to establish relationship between two variables both which are categorical in nature. Chi-square was used to compare observed data with data we would expect to obtain according to a specific hypothesis. The data collected was analysed using Statistical Package for Social Scientists (SPSS) version 17.

3.10 Ethical Considerations

Bryman (2007) states that it is the responsibility of the researcher to carefully assess the possibility of harm to research participants, and the extent that it is possible; the possibility of harm should be minimized. The research did not interfere with the privacy of the individuals, no names were mentioned and the respondents response to the questionnaires were entered and analysed without any manipulation of the original data.

3.11 Operationalization of variables

Table 3.2 Operational Variables

Objective	**Variable**	**Measurement**	**Measurement scale**	**analysis**	**Unit of measurement**
Determine the influence of infrastructure in adaptation and continued use of telemedicine	**Infrastructure**	Capacity to conduct telemedicine with other institution perfectly	Ordinal	Descriptive Statistics Chi - Square	Level of reliability of infrastructure
Determine how much technical skills the respondents have and compare it with other aspects of their medical activities.	**Technical skills**	Level of knowledge or capacity to handle telemedicine equipment/systems	Ordinal	Descriptive Statistics Chi – Square	Level of skills available to conduct telemedicine
To find out what is the perception of the medical staff towards the use and their awareness to the existing telemedicine and its use.	**Medical staff**	Attitude/acceptance of the telemedicine to the medical students and staff	Ordinal	Descriptive Statistics Chi – Square	Attitude of staff
To determine if there is any influence that medical policies have in the use of telemedicine and what recommended changes can be made to improve telemedicine,	**Medical policies**	If the staff are restricted by law to transfer patient information to other healthcare providers to help them manage patients or vice versa	Ordinal	Descriptive statistics Chi – Square	Limitation if any of the medical policies

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter presents the results of the survey, focusing on the socio-demographic characteristics, field of study, factors influencing use of telemedicine. The results of the relationship between the independent variables and research design are also presented in this chapter. 131 questionnaires were issued of which 79 were filled by the respondents. This was a 60.3% response rate.

4.2 The Socio demographic characteristics of the respondents

4.1 Gender

The respondents were asked to indicate their gender and their responses are summarized in the Table 4.1.

Table 4. 1 Gender of the Medical Staff

Gender of the medical Staff			
		Frequency	Percent
Valid	Male	53	67.1
	Female	26	32.9
	Total	**79**	**100.0**

Male 53 (67.1%) represented the greatest number of respondents as compared to their Female 26 (32.9%) counterparts.

4.2 Age

The respondents were asked to indicate their age and their responses are summarized in the Table 4.2.

Table 4. 2 Age of Medical Staff

		Frequency	Percent
Valid	31-40 years	5	6.3
	41-50 years	21	26.6
	51-60 years	41	51.9
	61 years and above	12	15.2
	Total	**79**	**100.0**

Respondents above the age of 60 were 12 representing 15.2% of the population. 41(51.9%) of the participants were between the age of 51 – 60 years. They represented the largest number of respondents captured the least were respondents between the ages of 31 – 40 years who were 6.3% (5) of the population as represented in Table 4.2.

4.3 Staff Position

The respondents were asked to indicate their staff position and their responses are summarized in the Table 4.3.

Table 4. 3 Staff position

Staff Position			
		Frequency	**Percent**
Valid	Assistant Lecturer	4	5.1
	Lecturer	38	48.1
	Senior Lecturer	22	27.8
	Associate Professor	14	17.7
	Professor	1	1.3
	Total	**79**	**100.0**

Lecturers represented the highest number of medical staff 38 (48%) with only one professor respondent representing 1.3% of the population Table 4.3.

4.3 Technical Skills of the Medical staff and use of telemedicine

The respondents were asked about the different levels of skills they have in regards to the different telemedicine equipment available.

4.3.1 Cross-tabulation Use of telemedicine and staff position

The respondents were asked to indicate their staff position and how often they use telemedicine and their responses cross-tabulation are summarized in the Table 4.4.

Table 4. 4 Use of telemedicine and staff position

			How often do you use telemedicine:				Total
			Daily	**Weekly**	**Monthly**	**rarely**	
Staff Position	Assistant Lecturer	Count	2	1	1	0	4
		% within Staff Position	50.0%	25.0%	25.0%	.0%	100.0%
	Lecturer	Count	9	10	11	7	37
		% within Staff Position	24.3%	27.0%	29.7%	18.9%	100.0%
	Senior Lecturer	Count	7	1	11	1	20
		% within Staff Position	35.0%	5.0%	55.0%	5.0%	100.0%
	Associate Professor	Count	1	0	8	5	14
		% within Staff Position	7.1%	.0%	57.1%	35.7%	100.0%
	Professor	Count	0	0	0	1	1
		% within Staff Position	.0%	.0%	.0%	100.0 %	100.0%
Total		Count	**19**	**12**	**31**	**14**	**76**
		% within Staff Position	**25.0%**	**15.8%**	**40.8%**	**18.4%**	**100.0%**

Table 4.4 shows that the lower level staffs were more likely to use telemedicine facilities 2 (50%) Daily basis as compared to their senior counterparts professors 1 (100%) and associate professors 5 (35.7%) rarely and 57.1% on a monthly basis. The senior lecturers were also more likely to use telemedicine on a daily basis i.e. 7(35%)

4.3.2 Chi-square Use of telemedicine vs Staff position

The respondents were asked to indicate their Use of telemedicine and Staff position the correlation to their response are summarized in the Table 4.5.

Table 4. 5 Chi-square Use of telemedicine vs Staff position

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	23.113	12	.027
Likelihood Ratio	25.656	12	.012
Linear-by-Linear Association	7.301	1	.007
N of Valid Cases	76		

There was a significant association between the staff position and the frequency of use of telemedicine ($\chi 2$ (12) = 23.113, $p<0.05$) as represented in Table 4.5. Therefore the staff at the lower positions were more likely to use telemedicine frequently.

4.3.3 Telemedicine use vs age

The respondents were asked to indicate their Frequency of telemedicine use vs age and their responses cross-tabulation are summarized in the Table 4.6.

Table 4. 6 Frequency of telemedicine use vs age

Age * How often do you use telemedicine: Crosstabulation							
			How often do you use telemedicine:				Total
			Daily	Weekly	Monthly	rarely	
Age	**31-40 years**	Count	3	1	1	0	5
		% within Age	60.0%	20.0%	20.0%	.0%	100.0%
	41-50 years	Count	4	4	6	4	18
		% within Age	22.2%	22.2%	33.3%	22.2%	100.0%
	51-60 years	Count	8	7	20	6	41
		% within Age	19.5%	17.1%	48.8%	14.6%	100.0%
	61 years and above	Count	4	0	4	4	12
		% within Age	33.3%	.0%	33.3%	33.3%	100.0%
Total		**Count**	**19**	**12**	**31**	**14**	**76**
		% within Age	**25.0%**	**15.8%**	**40.8%**	**18.4%**	**100.0%**

Table 4.6 represent a cross tabulation of age against how often telemedicine was used. The respondents between the ages of 31-40 years used telemedicine more often as compared to their counterparts.

The medical staffs between the ages of 31 – 40 years were more likely to use telemedicine. The medical staffs above the age of 60 years were the second most likely group to often use the telemedicine and also the least likely.

4.3.4 Chi-Square frequency of telemedicine use vs age

The respondents were asked to indicate their frequencies of telemedicine use vs age the Pearson Chi-Square to their response are summarized in the Table 4.7.

Table 4. 7 Chi-Square frequency of telemedicine use vs age

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.209	9	.334
Likelihood Ratio	12.125	9	.206
Linear-by-Linear Association	2.056	1	.152
N of Valid Cases	76		

The level of association between the age and the frequent use of telemedicine is not significant as shown in Table 4.7 $\chi 2\ (9) = 10.209$, $p>0.05$.

4.3.5 Use of computer for official purposes

The respondents were asked to indicate their use of computer for official use their response are summarized in the Table 4.8.

Table 4. 8 Use of computer

Do you use a computer for official purposes?			
		Frequency	Percent
Valid	yes	70	88.6
	No	6	7.6
	Total	76	96.2
Missing	System	3	3.8
Total		79	100.0

Table 4.8 shows the 70 (88.6%) of the respondents use computers for official use only 6 (7.6%)

4.3.6 Use computer for personal use

The respondents were asked to indicate their use of computer for personal (private practise etc.) use their response are summarized in the Table 4.9.

Table 4. 9 Computer for personal use

Do you use a computer for personal use?			
		Frequency	Percent
Valid	Yes	73	92.4
	No	3	3.8
	Total	76	96.2
Missing	System	3	3.8
Total		79	100.0

Table 4.9 Shows that even more respondents 73 (92.4%) use the computers for personal use compared to those who use it for official use 70 (88.6%) as shown in Table 4.8.

4.3.7 Consider themselves computer literate

The respondents were asked to indicate if they considered themselves computer literate their response are summarized in the Table 4.10.

Table 4. 10 computer literacy

Do you consider yourself computer literate?			
		Frequency	Percent
Valid	Yes	73	92.4
	No	3	3.8
	Total	76	96.2
Missing	System	3	3.8
Total		79	100.0

Table 4.10 shows that 73 (92.4%) of the respondents considered themselves computer literate.

4.3.8 Use of emails

The respondents were asked to indicate if they use emails their response are summarized in the Table 4.11.

Table 4. 11 Use of emails

Do you use for emails in telemedicine?			
		Frequency	Percent
Valid	Yes	73	92.4
	No	3	3.8
	Total	76	96.2
Missing	System	3	3.8
Total		79	100.0

Table 4.11 shows that most of the respondents 73 (92.4%) have been using emails for telemedicine.

4.3.9 Use of digital camera

The respondents were asked to indicate if they use digital camera their response are summarized in the Table 4.12.

Table 4. 12 Use of digital camera

Do you make use of a digital camera to take pictures?			
		Frequency	Percent
Valid	Yes	63	79.7
	No	13	16.5
	Total	76	96.2
Missing	System	3	3.8
Total		79	100.0

The respondents who use digital camera to take pictures 63 (79.7%) as part of telemedicine Table 4.12 while 13 (16.5%) of the respondents indicated that they don't use digital cameras to take pictures as part of telemedicine.

4.3.10 Computer formal training

The respondents were asked to indicate if they had received computer formal training their response are summarized in the Table 4.13.

Table 4. 13 Computer formal Training

		Frequency	Percent
Valid	Yes	30	38.0
	No	46	58.2
	Total	76	96.2
Missing	System	3	3.8
Total	79	100.0	

The relationship between staff position and computer training tested statistically significant χ^2 (3) = 8.765, $p<0.05$ i.e. the medical staff with a lower staff position were more likely to have received computer training and age and computer training also tested statistically significant χ^2 (4) = 10.837, $p<0.05$ the younger members of medical staff were more likely to have receive computer training in table. 4.13 the response if they had received formal computer training 30 (38%) of the respondents responded yes and 46 (58.2%) responded no.

4.4 Medical policies and use of telemedicine

4.4.1 Remuneration of doctors

The respondents were asked to indicate if remuneration should be factored in medical policies regarding issues of telemedicine their response are summarized in the Table 4.14.

Table 4. 14 Remuneration of doctors

Should doctors remuneration be factored in medical policies in regards to issuing consultation using telemedicine			
		Frequency	Percent
Valid	Yes	61	77.2
	No	16	20.3
	Total	77	97.5
Missing	System	2	2.5
Total		79	100.0

Most of the respondents 61 (77.2%) would recommend that they be remunerated for consultations regarding patient healthcare as shown in Table 4.14

4.4.2 Law and telemedicine

The respondents were asked to indicate if they knew the laws of telemedicine their response are summarized in the Table 4.15.

Table 4. 15 Law and telemedicine

Does the laws in telemedicine facilitate the use of telemedicine in patient health care			
		Frequency	Percent
Valid	Yes	49	62.0
	No	23	29.1
	Total	72	91.1
Missing	System	7	8.9
Total		79	100.0

In Table 4.15 49 (62.0%) responded yes law supporting the use of telemedicine.

4.4.3 Patient information

The respondents were asked to indicate if they could discuss information about a patient's treatment with other physicians using e-mail or any other telemedicine media their response are summarized in the Table 4.16.

Table 4. 16 Patient information

May a physician discuss information about a patient's treatment with other physicians using e-mail or any other telemedicine media			
		Frequency	Percent
Valid	**Yes**	70	88.6
	No	9	11.4
	Total	**79**	**100.0**

In Table 4.16 70 (88.6%) of the respondents responded yes to the use email as telemedicine activities in healthcare

Table 4. 17 Kenyan Medical policies and telemedicine

Does Kenyan Medical policies encourage the use to telemedicine in patient healthcare			
		Frequency	Percent
Valid	yes	37	46.8
	No	40	50.6
	Total	77	97.5
Missing	System	2	2.5
Total		**79**	**100.0**

37 (46.8%) of the respondents answered yes to the laws in telemedicine and Kenyan medical policies encourage the use of telemedicine in patient health care respectively (Table 4.17). There were no association on most aspects when we compared the socio demographic aspects of the respondents and medical policies. The significant association between the gender and use if telemedicine in patient healthcare the female 20 (87.0%) were more likely to use telemedicine as compared to their male 28 (57.1%) counterparts χ^2 (2) = 6.0261, p<0.05.

4.5 Infrastructure and use of telemedicine

The respondents responded to the availability of infrastructure and their level of knowledge to the existence of infrastructure.

4.5.1 Telemedicine Infrastructure

The respondents were asked to indicate if the School of medicine supports in-terms telemedicine infrastructure their response are summarized in the Table 4.18.

Table 4. 18 Telemedicine Infrastructure

Does the School of medicine support in-terms telemedicine infrastructure			
		Frequency	Percent
Valid	Strongly agree	10	12.7
	Agree	42	53.2
	Disagree	23	29.1
	Strongly Disagree	4	5.1
	Total	**79**	**100.0**

Table 4.18 42(53.2%) of the respondents agreed and only 4(5.1%) of the respondents strongly disagreed.

4.5.2 Resources necessary to use telemedicine

The respondents were asked to indicate if there are resources necessary to use telemedicine at the School of medicine their response are summarized in the Table 4.19.

Table 4. 19 Telemedicine resources

Are there resources necessary to use telemedicine			
		Frequency	Percent
Valid	Strongly agree	16	20.3
	Agree	41	51.9
	Disagree	16	20.3
	Strongly Disagree	6	7.6
	Total	**79**	**100.0**

Table 4.19 41 (51.9%) of the respondents agreed that there was sufficient resource resources for telemedicine and those who thought that the school of medicine had provided enough facilities for telemedicine. There was a great association between the people who often use telemedicine infrastructure and: Telemedicine is not compatible with other systems I use $\chi^2(9)=32,640$, $p<0.05$, Telemedicine improves my productivity $\chi^2(9)=39,289$, $p<0.05$, Has the university made telemedicine (internet) readily available to the medical staff $\chi^2(9)=34,551$, $p<0.05$. Therefore, the medical staff who were confident with the university infrastructure were more likely to improve their productivity.

4.6 Medical staff attitude and use of telemedicine

The medical staff 43 (57.3%) were hesitant using telemedicine, as they feared making mistakes they could not correct. There was also a statistical association between the age of the respondents and hesitation to use telemedicine χ^2 (9) = 19.578, $p<0.05$ i.e. the older medical staff were most likely to hesitate using telemedicine as they feared making mistakes they could not correct.

4.6.1 Fear of making mistakes vs hesitation to use telemedicine

The respondents were asked to indicate if they feared making mistakes and if they were hesitant to use telemedicine their response are summarized in the cross-tabulation of the two responses in Table 4.20.

Table 4. 20 Telemedicine hesitation use against age

I hesitate using telemedicine for fear of making mistakes I cannot correct * Age Cross tabulation											
		I hesitate using telemedicine for fear of making mistakes I cannot correct								Total	
		Strongly agree		Agree		Disagree		Strongly Disagree			
		Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total	Count	% of Total
Age	**31-40 years**	1	1.3%	4	5.3%	0	.0%	0	.0%	5	6.7%
	41-50 years	0	.0%	11	14.7%	6	8.0%	4	5.3%	21	28.0%
	51-60 years	0	.0%	23	30.7%	9	12.0%	5	6.7%	37	49.3%
	61 years and above	0	.0%	5	6.7%	3	4.0%	4	5.3%	12	16.0%
Total		**1**	**1.3%**	**43**	**57.3%**	**18**	**24.0%**	**13**	**17.3%**	**75**	**100.0%**

The mean for the category is 2.29 with the set mode at 2 (agree). A half of the respondents 39 (49.4%) who used telemedicine were encouraged by people who influence their behaviour, 42 (53.2%) of the respondents were influenced by people important to them to use telemedicine, 52 (65.8%) of the respondents thought that the senior management of the institution were helpful in the use of telemedicine and 42 (53.2%) of the respondents though the institution supported telemedicine.

	Mean
• People who influence my behaviour think I should use telemedicine	**2.33**
• People who are important to me think I should use telemedicine	**2.25**
• The senior management of my institution have been helpful in the use of telemedicine	**2.35**
• In general the school of medicine has supported telemedicine	**2.36**

4.6.2 General acceptance of telemedicine

Mean of the last category was 1.81 with the set mode of 2 (agree). Not as many medical staff agreed to the fact the in using telemedicine the salaries would increase significantly.

The following is the combined level of acceptance (strongly agree and agree) to the following statements by the respondents:

I find telemedicine useful in my job	**57 (94.4%)**
Using telemedicine enables me to perform tasks more quickly	**57 (82.6%)**
Using telemedicine enables me to be more productive	**64 (86.5%)**
If I use telemedicine, I will increase my chances of getting a salary increase	**42 (57.7%)**

4.6.2.1 Salary increment and hesitation to use telemedicine

The respondents were asked to indicate if salary increment and hesitation to use of telemedicine their response are summarized in the cross-tabulation of the two responses in Table 4.21.

Table 4. 21 Salary increament against hesitation to use telemedicine

If I use telemedicine, I will increase my chances of getting a salary increase * I hesitate using telemedicine for fear of making mistakes I cannot correct Crosstabulation

			I hesitate using telemedicine for fear of making mistakes I cannot correct				**Total**
			S. agree	Agree	Disagree	S. Disagree	
If I use telemedicine, I will increase my chances of getting a salary increase	Strongly agree	Count	1	16	3	1	21
		% of Total	1.4%	22.5%	4.2%	1.4%	29.6%
	Agree	Count	0	18	2	0	20
		% of Total	.0%	25.4%	2.8%	.0%	28.2%
	Disagree	Count	0	1	9	0	10
		% of Total	.0%	1.4%	12.7%	.0%	14.1%
	Strongly Disagree	Count	0	7	4	9	20
		% of Total	.0%	9.9%	5.6%	12.7%	28.2%
Total		**Count**	**1**	**42**	**18**	**10**	**71**
		% of Total	**1.4%**	**59.2%**	**25.4%**	**14.1%**	**100.0%**

In Table 4.21 16 (22.5%) of the respondents strongly agreed that they were most likely to get a salary increment if they used telemedicine but at the same time they were more hesitant to use telemedicine.

4.6.2.2 Use of telemedicine/getting salary increment hesitation making fear

Table 4. 22 Chi-square If I use telemedicine, I will increase my chances of getting a salary increase * I hesitate using telemedicine for fear of making mistakes I cannot correct Crosstabulation

Chi-Square Tests			
	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	51.363[a]	9	.000
Likelihood Ratio	47.225	9	.000
Linear-by-Linear Association	20.411	1	.000
N of Valid Cases	71		

It was also observed that the medical staff who were hesitant to use telemedicine were also most likely to have an increased chance of getting a salary increment. There was a statistical significant association of χ^2 (9) = 51.363, p<0.05 (Table 2.23).

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSSION AND RECOMMENDATIONS

5.1 Introduction

This section presents the study's summary of discussions, findings, conclusions and recommendations in regards to the data collected in the previous chapter (chapter 4). The summary of the analysis of each research indicator is featured and from the study analysis, associated recommendations and suggestions for further research are made.

5.2 Summary of findings

The study sought to find out the factors influencing use of telemedicine in Africa: A case of School of Medicine University of Nairobi. The study mainly focused on the members of staff who were also medical doctors at the University of Nairobi/Kenyatta National Hospital. The factors looked into Infrastructure, attitude of the Medical Staff, Medical policies and technical skills in acceptance of telemedicine and its use.

5.2.1. Summary of findings Medical policies

Most of the respondents 61 (77.2%) would recommend that they be remunerated for consultations regarding patient healthcare. While 49 (62.0%) and 37 (46.8%) of the respondents answered yes to the laws in telemedicine and Kenyan medical policies encourage the use of telemedicine in patient health care respectively.

5.2.2. Summary of findings Infrastructure

41 (51.9%) of the respondents agreed that there was sufficient resource resources for telemedicine and those who thought that the school of medicine had provided enough

facilities for telemedicine 24(53.2%) of the respondents agreed and only 4(5.1%) of the respondents strongly disagreed.

There was a great association between the people who often use telemedicine infrastructure and: Telemedicine is not compatible with other systems I use $\chi^2(9)=32,640$, $p<0.05$, Telemedicine improves my productivity $\chi^2(9)=39,289$, $p<0.05$, Has the university made telemedicine (internet) readily available to the medical staff $\chi^2(9)=34,551$, $p<0.05$. Therefore, the medical staff who were confident with the university infrastructure were more likely to improve their productivity.

5.2.3. Summary of findings medical staff attitude

The medical staff 43 (57.3%) were hesitant using telemedicine as they feared making mistakes they could not correct. There was also a statistical association between the age of the respondents and hesitation to use telemedicine $\chi2\ (9) = 19.578$, $p<0.05$ i.e. the older medical staff were most likely to hesitate using telemedicine as they feared making mistakes they could not correct. The medical staff had positive attitude improvement through the use of telemedicine as per their response in the following areas; people who influence my behaviour think I should use telemedicine, people who are important to me think I should use telemedicine, the senior management of my institution have been helpful in the use of telemedicine and in general the school of medicine has supported telemedicine

5.2.4. Summary of findings technical skills

The respondents had good technical skills as per the following responses: do you consider yourself computer literate 73 (92.4%) responded yes, do you use computer for official use 70 (88.6%) responded yes, do you use computer for personal use 73 (92.4%) responded yes, do

you make use of a digital camera to take pictures 63 (79.7%) responded yes, do you use emails 73 (92.3%) responded yes

5.3 Discussion of findings

According to Mugenda (2003), a response rate above 50% can be used in establishing the research objectives and answering research questions . A total of 131 questionnaires were issued and 79 were received back from the respondents. This amounted to 60.3% response rate. Two thirds of the respondents were male and a third were female their age ranged from 31 years to those above the age of 61 years, most of the respondents were between the age of 51 years to below 60 years 62 (51.9%). Medical staff between the age of 31 – 40 years were more likely to use telemedicine. 73 (92.4%) of the respondents considered themselves computer literate and 70 (88.6%) of the medical staff used telemedicine for official use. Out of all the respondents only 30 (38.0%) had received formal computer training. The younger members of staff were more likely to have received computer training and also the staff in the lower positions i.e. relationship between staff position and computer training tested statistically significant χ^2 (3) = 8.765, $p<0.05$ and age and computer training also tested statistically significant χ^2 (4) = 10.837, $p<0.05$.

Mars, 2013 states that offering patient care over distance and possibly from another country raises issues such as liability, licensure, jurisdiction, quality and continuity of care, confidentiality, data security, consent, authentication and remuneration. Maryland Health Concil, 2011 it is mentioned that a 2010 Virginia law requires all health insurers, health care subscription plans, and health maintenance organizations (HMOs) to offer coverage for telemedicine services. On remuneration 61 (77.2%) of the medical staff concluded that they would like to be paid for consultations offered via telemedicine while only 49 (62.0%) of the medical staff responded that the law facilitates the use of telemedicine in patient healthcare.

40 (50.6%) of the medical staff responded no to Kenyan medical policies encourage the use of telemedicine in patients healthcare, it was also found that the female were more likely to use telemedicine in patient healthcare as compared to male χ^2 (2) = 6.0261, p<0.05.

5.4 Conclusion of the study

The study assessed the factors influencing the use of telemedicine in Africa: A case of School of Medicine University of Nairobi. The study brought out the following:

1 Most of the older medical staff was hesitant to use telemedicine.

2 Efforts put in by the respondents in patient care should be remunerated to improve the use of telemedicine.

3 Telemedicine improved how the respondents worked within their departments.

5.5 Recommendation of the study

1 The medical Staff should be well introduced to the level of infrastructure at the School of medicine and the technicians available to guide them in using telemedicine.

2 General medical policies should be reviewed to introduce the remuneration of doctors who give consults using electronic media as a way of encouraging the use of the system.

3 There should be a limitation to the kind of patients healthcare that can be given via telemedicine as many of the older doctors were found to be more hesitant in using telemedicine in patient healthcare.

4 During the establishment of new telemedicine infrastructure the medical staff should be consulted so as to allow for the adaptation and use of the equipment.

5 The School of medicine should create workshops and seminars where the medical staff can be trained and introduced in to other forms of telemedicine.

6 More medical staff should be encouraged to use telemedicine as many thought it improved their work

5.6 Suggestion for further research

The following are areas for further research:

1 Factors that Make Medical staff hesitant to use telemedicine in patient healthcare and medical policies.

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APPENDICES

Appendix I. Letter of Transmittal

Adol I. Edwin
University of Nairobi, School of Continuing and Distance Education
Department of Extra Mural Studies
P. O. Box 30197
Nairobi,

May 2014

Dear Respondent

I am a student at the University of Nairobi, pursuing a Masters of Art Degree in Project Planning and Management. I am conducting a study that is intended to determine the challenges affecting the setting up of telemedicine in Africa. This study is intended to help in creating a telemedicine facility that can function well within the African setting.

Attached find a questionnaire meant for gathering information for this study. Please fill the questionnaire honestly and to the best of your knowledge. All responses will be handled with absolute confidence and will be used solely for the purpose of this study.

Thank you,

Yours faithfully
Adol I. Edwin
Reg. No. L50/82737/2012

Appendix II: Questionnaires

This survey is intended to help your facility add value to the current telemedicine forums and gauge interest in telemedicine.

Telemedicine is defined by the American Telemedicine Association (2013) as "the use of medical information exchanged from one site to another via electronic communications for the health and education of the patient or healthcare provider and for the purpose of patient care."

Demographics

1. Gender

   ☐ Male ☐ Female

2. Age

   ☐ 20 – 30 years ☐ 31 – 40 years

   ☐ 41 – 50 years ☐ 51 – 60 years

   ☐ 61 years and above

3. Academic qualification:

   ☐ Assistant Lecturers ☐ Associate Professor

   ☐ Lecturer ☐ Professor

   ☐ Senior Lecturer ☐ Professor Emeritus

   Others:_____

4. How often do you use telemedicine:

   ☐ Daily

   ☐ Weekly

   ☐ Monthly

5. How would you describe your knowledge of telemedicine in general:

   ☐ Not Knowledgeable ☐ Knowledgeable

   ☐ Somewhat Knowledgeable ☐ Very Knowledgeable

6. From your observation, do you think the School of Medicine has the capacity to conduct real time teleconference with other medical institutions (local and international)?

   ☐ Yes ☐ No

SECTION 2

Indicate the degree to which you agree or disagree with the following statement as they relate to using Telemedicine

1 Strongly agree 3 Disagree

2 Agree 4 Strongly Disagree

7.	Using telemedicine gives me greater control over my work	1	2	3	4
8.	Telemedicine enables me accomplish tasks more quickly	1	2	3	4
9.	Telemedicine supports critical aspects of my job	1	2	3	4
10.	Telemedicine improves my productivity	1	2	3	4
11.	Telemedicine improves my job performance	1	2	3	4
12.	Telemedicine improves my effectiveness on my job	1	2	3	4
13.	Overall, I find telemedicine useful in my job	1	2	3	4

Adopted from Davis, 1989

SECTION 3

Indicate the degree to which you agree or disagree with the following statement as they relate to using Telemedicine

1 Strongly agree 3 Disagree

2 Agree 4 Strongly Disagree

MEDICAL POLICIES

		Yes	**No**
14.	Should doctors remuneration be factored in medical policies in regards to issuing consultation using telemedicine		
15.	Does the laws in telemedicine facilitate the use of telemedicine in patient health care		
16.	May a physician discuss information about a patient's treatment with other physicians using e-mail or any other telemedicine media		
17.	Do Kenyan Medical policies encourage the use to telemedicine in patient healthcare		

SECTION 4

Indicate the degree to which you agree or disagree with the following statement as they relate to using Telemedicine

1 Strongly agree 3 Disagree

2 Agree 4 Strongly Disagree

INFRASTRUCTURE

Facilitating conditions

18.	Are there resources necessary to use telemedicine	1	2	3	4
19.	Has the university made telemedicine (internet) readily available to the medical staff	1	2	3	4
20.	Telemedicine is not compatible with other systems I use	1	2	3	4
21.	There is a specific person allocate for assistance if I experience system difficulties	1	2	3	4
22.	Is there sufficient electric power to support the use of telemedicine and facilitate its use	1	2	3	4
23.	Does the School of medicine support in-terms telemedicine infrastructure	1	2	3	4
24.	Has the School of medicine provided venues for teleconference with other institutions	1	2	3	4
25.	How would you relate to the Performance Expectancy of the telemedicine facilities in the School of Medicine	1	2	3	4

SECTION 5

Indicate the degree to which you agree or disagree with the following statement as they relate to using Telemedicine

1 Strongly agree 3 Disagree

2 Agree 4 Strongly Disagree

TECHNICAL SKILLS

Perceived ease of use

26.	I find it cumbersome to use the Telemedicine system	1	2	3	4
27.	Learning to operate the telemedicine is easy for me	1	2	3	4
28.	Interacting with the telemedicine system is often frustrating	1	2	3	4
29.	I find it easy to get the telemedicine system to di what I want it to do	1	2	3	4
30.	The telemedicine system is rigid and inflexible to interact	1	2	3	4
31.	It is easy for me to remember how to perform task using the telemedicine system	1	2	3	4
32.	Interacting with the system requires a lot of my mental effort	1	2	3	4
33.	My interaction with the telemedicine system is clear and understandable	1	2	3	4
34.	I find it takes a lot of effort to become skilful at using the telemedicine	1	2	3	4
35.	Overall, I find the telemedicine system easy to use	1	2	3	4

Adopted from Davis, 1989

		Yes	**No**
36.	Do you consider yourself computer literate?		
37.	Do you use a computer for official use?		
38.	Do you use a computer for personal use?		
39.	Do you use for emails?		
40.	Do you make use of a digital camera to take pictures?		
41.	Have you received any formal computer training?		

Frequency of use of telemedicine

	Modality	**Never**	**Seldom**	**Often**	**Daily**
42.	Short Message Service				
43.	Telephone conversations				
44.	E-mail				
45.	E-mail with photographs attached				

46.	Teal time system (PC, Teleconference)				

SECTION 5

Indicate the degree to which you agree or disagree with the following statement as they relate to using Telemedicine

1 Strongly agree 3 Disagree

2 Agree 4 Strongly Disagree

ATTITUDE TOWARDS THE SYSTEM

47.	Making use of telemedicine is a good idea	1	2	3	4
48.	Telemedicine makes work more interesting	1	2	3	4
49.	I like working with telemedicine system	1	2	3	4
50.	I feel apprehensive towards using telemedicine	1	2	3	4
51.	I hesitate using telemedicine for fear of making mistakes I cannot correct	1	2	3	4

Social influence					
52.	People who influence my behaviour think I should use telemedicine	1	2	3	4
53.	People who are important to me think I should use telemedicine	1	2	3	4
54.	The senior management of my institution have been helpful in the use of telemedicine	1	2	3	4
55.	In general the School of Medicine has supported telemedicine	1	2	3	4

Behaviour intention					
56.	I intend to use telemedicine in the next 12 months	1	2	3	4
57.	I predict I will use telemedicine in the next 12 months	1	2	3	4
58.	I plan to use telemedicine in the next 12 months	1	2	3	4

Adopted form Venkatesh, 2003

General Acceptance					
59.	I find telemedicine useful in my job	1	2	3	4

60.	Using telemedicine enables me to perform tasks more quickly	1	2	3	4
61.	Using telemedicine enables me to be more productive	1	2	3	4
62.	If I use telemedicine, I will increase my chances of getting a salary increase	1	2	3	4

63. Are you aware that the School of Medicine has three sites where teleconference can be conducted (UNITID, Department of Human Pathology and Library)

☐ Yes ☐ No

64. If you were to be invited to an international teleconference discussion on healthcare in your various fields would you attend

☐ Yes ☐ No