ADOPTION OF TELEMEDICINE SERVICES BY MEDICAL PROFESSIONALS IN SELECTED HOSPITALS IN ZARIA METROPOLIS, KADUNA STATE, NIGERIA

Sambo Suleiman

Ahmadu Bello University, Zaria.

Mohammed Habibu

Ahmadu Bello University, Zaria.

Babangida U. Dangani

Ahmadu Bello University, Zaria.

Abstract

This study was carried out to investigate the 'Adoption of Telemedicine Services by Medical Professionals in Selected Hospitals in Zaria Metropolis, Kaduna State, Nigeria. Three research questions were raised; What is the current level of awareness among Medical Professionals regarding Telemedicine in Zaria Metropolis Kaduna State Nigeria?, What are the level of ethical, legal and regulatory considerations associated with the use of Telemedicine in Zaria Metropolis Kaduna State Nigeria? and What are the key challenges and barriers to the use of Telemedicine in Zaria Metropolis Kaduna State Nigeria? The study used Quantitative Methodology and Cross-Sectional Survey Design to carry out the research among various Medical Professionals using a sampling frame obtained from a list of selected Hospitals located in and around Zaria Metropolis Kaduna State, Nigeria, from 2022-2023. Proportionate Stratified Sampling technique was used in this study. The study revealed that majority of Medical Professionals are fully aware of Telemedicine in Zaria Metropolis even though they do not utilize it on daily basis, also that majority of Medical Professionals in Zaria Metropolis seek informed consent of patients while utilizing Telemedicine and that Patient privacy and confidentiality is protected and that Limited access to technology and privacy and security concerns are the major challenges hindering the utilization of Telemedicine by Medical Professionals in Zaria Metropolis. The study concluded that Utilization of Telemedicine by Medical Professionals in Zaria Metropolis has a number of benefits, including increased access to Medical Care, improved quality of Medical Care, reduced costs, increased efficiency and effectiveness, improved patient satisfaction, and the potential to revolutionize the delivery of Medical Care in Zaria Metropolis even

though there are some challenges that needed to be looked at. The following recommendations where made; that Efforts should be made to encourage the use of Telemedicine by Medical Professionals in Zaria Metropolis on daily basis due to the numerous benefits by creating more awareness, Medical Professionals in Zaria Metropolis should be encourage to work more on Professional Conduct, Malpractice insurance, Data Protection and Reimbursement to patients and Medical Care providers should give more access to technology and Privacy and security as well as encouraging the use of Telemedicine.

Keywords: Adoption, Awareness, Medical Care, Medical Professionals, Telemedicine, Ethical, e-health, Hospital, Tele-health, Telemedical, Services

Introduction

The role of information and communication technology (ICT) in the advancement of Medical Care is a topic of significant importance in the current trends. Telemedicine refers to the delivery of healthcare services through the use of telecommunications technology, enabling remote consultations, diagnosis, and treatment. This approach leverages video conferencing, mobile apps, and other digital communication tools to provide clinical services to patients without the need for in-person visits. The primary goal of telemedicine is to increase access to healthcare, especially for individuals in remote or underserved areas, and to improve the efficiency and quality of care. According to the World Health Organization (WHO), telemedicine involves "the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment, and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" (World Health Organization, 2010).

Advances in ICT have led to the development of new Telemedicine tools and applications. The rapid advancement of ICT has brought about significant changes in various fields, including Medical Care. The use of ICT as a tool in Medical Care has improved the delivery of Medical Care services and enhanced patient outcomes. Some of the ICTs tool involved in Medical Care are remote monitoring devices, mobile health applications, and video conferencing tools among others. Remote monitoring devices, such as blood pressure monitors, glucose meters, and heart rate monitors, allow patients to monitor their vital signs remotely. Patients can transmit their readings to Medical Care providers who can then provide appropriate feedback and care. Remote monitoring devices have been particularly useful for patients with chronic conditions such as diabetes, hypertension, and heart disease, as they allow Medical Care providers to monitor patients' medical status more closely and intervene early if necessary (Haque & Rahman 2020).

Mobile health apps are another example of ICTs tools used in Medical Care, these apps can be used to monitor patients'' health, remind them to take medications, and provide them with educational resources. Patients can use these apps to track their symptoms, receive medication reminders, and access Medical Care information (Haque & Rahman 2020). Medical Care providers can also use these apps to monitor patients'' progress and adjust treatment plans accordingly. Video conferencing tools have also revolutionized Medical Care by enabling virtual consultations between Medical Care providers and patients. Patients can consult with their Medical Care providers from the comfort of their homes, saving time and travel costs. Video conferencing tools have been particularly useful for patients in rural or remote areas who may not have access to Medical Care services.

According to report by the American Medical Association (AMA) (2023), telemedicine has rapidly evolved and expanded, especially in response to the COVID-19 pandemic, which highlighted the need for remote healthcare solutions. The report states, "Telemedicine has become a critical component of healthcare delivery, offering a convenient and efficient way for patients to receive care while reducing the burden on healthcare systems" (American Medical Association, 2023). Telemedicine has also been shown to reduce Medical Care costs significantly. According to a study conducted by the University of California, Davis in 2015, Telemedicine can reduce Medical Care costs by up to 40% in certain cases (Bashshur et al., 2016). Telemedicine has also been shown to reduce the number of hospital admissions, readmissions, and emergency room visits, which reduces Medical Care costs further.

Statement of the Problem

The advancement that has been recorded in the field of Technology over the years has been of significant advantage to Telemedicine especially in the area of improved medical care and outcomes of clinical procedures for emergency medical situations. Despite the potential benefits of telemedicine in improving Samaru Journal of Information Studies Vol. 24 (2) 2024

healthcare delivery, the adoption of telemedicine services by medical professionals in Zaria Metropolis, Kaduna State, Nigeria, remains limited. Hollander & Carr (2020) states that innovations in Telemedicine can reduce the need for patient mobility in remote areas. It is the ultimate solution to the problem of lack of healthcare professionals. Also InTouch, (2021) posited that Telemedicine has the potential to reduce healthcare costs, improve patient reach and health outcomes, and transform the way healthcare providers treat patients. This study aims to investigate the barriers and facilitators affecting the adoption of telemedicine services in selected hospitals within the region, providing insights to enhance implementation strategies and improve healthcare outcomes.

Research Questions

- 1. What is the current level of awareness among Medical professionals regarding Telemedicine Services in Zaria Metropolis Kaduna State Nigeria?
- 2. What are the level of ethical, legal and regulatory considerations associated with the use of Telemedicine Services by Medical Professionals in Zaria Metropolis Kaduna State Nigeria?
- 3. What are the key challenges to the use of Telemedicine Services by Medical Professionals in Zaria Metropolis Kaduna State Nigeria?

Review of Related Literature

Enhancing awareness among Medical professionals about Telemedicine Services in Medical Care facilities is essential for its successful implementation. ICT enabled medical services such as Telemedicine and e-health is fast developing from the recent past which supports long distance health care services. The term is often used as an umbrella term that includes Tele-health, electronic medical records, e-health and other components of health information technology (Wootton, (2001).

E-health is the use of electronic information and advanced telecommunication technologies to support long distance clinical health care, patient's health records, patients and professional health related education, public health and health administration (WHO 2010). The World Health Organization (WHO) defines e-health as the cost-effective use of ICT (Information and Communications Technologies) in the support of health and health related fields including Medical Care services, health surveillance, education, knowledge and research (WHO, (2010). E-health may be synchronous/real-time or non-

synchronous "store and forward". It is seen as a means of overcoming the growing shortage of health practitioners in developing countries. The health sector has been much less effective than many other sectors in reaping reward from the applications of ICT. There are many possible reasons why implementation of e-health systems continues to be challenging despite the available literature. The success of any new technology depends on many factors including the knowledge and understanding of the concept, skills acquired attitude and working environment by the concerned professionals.

This is applicable for any new medical technology like Telemedicine where it is important to make professionals understand the new concept and assess how far they are professionally ready to accept and provide Telemedicine services. Telemedicine is an emerging technology in health sector across the globe, so it requires study to be done to know the health professionals and patients' awareness and their attitude towards Telemedicine (George, Rozariow & Abraham 2007). To facilitate the adoption of Telemedicine in developing countries requires information about the Awareness, Knowledge, Attitude and Skills (AKAS) of the user groups. Medical Care facilities should invest in comprehensive training programs to educate Medical professionals about Telemedicine. These programs should be ongoing and include hands-on experience with the system. Telemedicine awareness training should be designed with user-friendly interfaces, making it easier for Medical Professionals to navigate and utilize the system without extensive technical knowledge and at the same time Incentives, such as recognition and rewards for proficient Telemedicine usage, can motivate Medical Care professionals to embrace the technology.

The coronavirus disease 2019 (COVID-19) pandemic has drained physicians, hospitals, and Medical Care institutes. This overwhelming pressure has rapidly shifted Medical Care delivery to Telemedicine in response to the increased demand for primary care and patients' needs for Medical Care services at their convenience. Telemedicine embraces electronic communication technologies to provide Medical Care services to patients regardless of geographical barriers (Hau, Kim, Hur & Chang 2020). Oxford defines it as "the remote diagnosis and treatment of patients by means of telecommunications technology".

However, Telemedicine is not a new concept in the medical community; it has only resurfaced during the COVID-19 pandemic. A book on Telemedicine sheds light on the fact that clinicians, researchers in health services, and others have been studying how to employ cutting-edge computer and telecommunications technology to enhance Medical Care for more than 50 years. Telemedicine is a product of this advanced information technology's intersection and is central to many smart initiatives (Field, 1996). As Medical Care systems worldwide are undergoing profound changes. Telemedicine is gaining attraction beyond its demand in rural areas.

As rightly suggested by Chaet et al, (2017) significant advances in medical management cannot be achieved without a review of clinical ethics. The same goes for Telemedicine which is posed to make unprecedented advances in the medical and health world. Ethics is a broad subject that covers all aspects of society (Aurore, 2020). This vast domain that ethics cover has made it difficult for scholars to adopt a universal definition for it. That notwithstanding, ethics is a reflection of human values.

Current realities in Telemedicine have thrown up several ethical issues because Telemedicine has made a vast number of medical resources available on the internet allowing just anyone to access them. This implies that patients may be inspired to want to make certain medical decisions based on information that they sourced. While this sounds good as they can better make informed decisions, it raises some concern as to the validity of the medical information that they have and leaves medical caregivers in a dilemma between what they know and what the patient knows since they are bound by ethical codes to not harm the patient.

Ethics permeates all aspects of human life and it has serious consequences on how people and institutions operate. Although there are also sides to ethics, of significant interest to this research is ethics in medical practice, especially Telemedicine. That is because Medical Professionals are charged with the responsibility of working with humans. Given their role, they have to abide by certain ethical guides to protect their lives and the patients as well. This has a greater significance in Telemedicine because medical experts are allowed to carry out consultations and handling of patient data from remote locations. This can happen between medical practitioners that have never seen each other in real life like it happens when a medical radiologist interprets imaging results for a Medical doctor in charge of primary medical care as stated by Moulaei K, Shanbehzadeh M, Bahaadinbeigy K, et al. (2022) that in the synchronous mode (such as video conferences or telephone), patients can engage in real-time communication with their doctors, enabling immediate diagnosis and treatment recommendations while in the asynchronous or store-and-forward mode, patients can share medical images, test results, or descriptions of symptoms, allowing healthcare providers to review the information at a later time and respond with appropriate guidance or prescriptions. The standards of medical care provided will be enhanced to a high level prompting concerns about Telemedicine application as it is a field that is advancing every day just as technology advances.

It raises some ethical, and legal problems particularly because it disconnects the patient from the doctor in a way by allowing physicians to connect and carry out diagnosis and medical procedures without the patient being directly involved. Telemedicine offers expert support to committees set up to look into ethical matters arising from the practice. This is responsible for its wide range of applications in many aspects of health such as neurology, and behavioural health. This has become notable in the management of post-stroke health which involves communication. Patients have the right to decide the medical procedures that should be used in their treatment. It is then the responsibility of the health service provider to ensure that they have all the information that they require to make an informed decision about their treatment.

Research by the Federation of State Medical Board (FSMB) (2022) shows that for informed consent patient documentation, health provider, type of Telemedical treatment to be received, recognition of the medical practitioner's right to decide how appropriate it is to use Telemedicine to manage an ailment, security o health records and information, privacy risks associated with the use of Telemedicine, not holding the service providers blameworthy if the information is lost due to technical issues and permission of patient before information are sent to third parties. In circumstances of self-care, patients now referred to as mere users may face some risks managing their health through self-care Telemedical apps because while it protects their rights as users, it may not offer much protection in terms of patients since the original goal is not mere satisfaction but improved health outcomes.

Although there is an increase in the adoption of ICT in the field of medicine which is now known as Telemedicine, there have been some challenges that arise in the course of implementation. Coyne (1995) posited that the gap between the rich and the poor has been widened by the implementation of ICT in the field of medicine and Medical Care. Coyne raised an argument about how Telemedical infrastructures are expensive and available more in advanced countries than in poorer ones. Although Telemedicine is beneficial as stated by Edejer (2000) it remains dramatic as it contributes to the widening inequality gap because those that need the internet resources or ICT have the least resources to access them.

Furthermore, there is contradictory information on the internet about various medical subjects hence it poses a big challenge to the success of Telemedicine. It makes it more difficult to find a solution to the problem as the amount of resources is very vast. (Samuel et al., 2004). The internet often presents vast amounts of information that are relevant to helping in the administering of treatment. Other web-related challenges include; the quality of information provided by the largely inconsistent internet. Also, the absence of adequate research information from the developing countries that face the most health crises is a major challenge. There is also a problem with the distribution of technology meaning that such resources are not readily available. Even when they are available there is the issue of access to the ICT facilities.

The place of behavioural factors was also considered due to recurrent academic dishonesty (Stephens, 2004). While learning takes place via ICT facilities, it can be affected by behavioural qualities like honesty, respect, trust, and responsibility. Behavioural factors can have either a positive or a negative impact on the overall outcome. Furthermore, another obstacle is the high cost of ICT infrastructure and the cost of incorporating them into Medical Care systems (Tygerberg Childrens Hospital, 2003).

Although researchers have rated the ICT infrastructure in South Africa as the highest in Africa, (WorldFactbook, 2008), the problem of access to networks remains due to poor connectivity in some areas. However those areas can be reached through wireless connectivity even with the absence of technological infrastructure. (Louw and Hanmer, 2002).

Methodology

Quantitative methodology was used, along with Cross-Sectional Survey Design in conducting this study on various Medical Professionals in selected hospitals in Zaria metropolis, Kaduna State, Zaria from 2022 – 2023. The Proportionate Stratified Sampling technique was employed in this research. Stratified sampling is a sampling procedure in which elements of the population are divided into homogenous subgroups (called "strata"). A simple random sampling was used to draw the sample from within each subgroup. The choice of Stratified sampling is because Hospitals in Zaria Metropolis are in different locations as well as being homogenous and heterogonous. Based on this the population of hospitals in Zaria Metropolis was divided into Three (3) status; Hajiya Gambo Sawaba General Hospital, Zaria, Al-Madina Clinic, Sabon Gari, and Ahmadu Bello University Teaching Hospital Shika. This position is supported by Ibrahim (2013) who revealed that if the population is large for the researcher to survey all its members, a small, but carefully chosen sample can be used to represent the population. Further stressed that a sample of 35% - 43% is considered an adequate representative sample in research. 35% of the total population was chosen randomly as the sample of the respondents in each stratum.

The summary of the target sample size of each stratum is shown in Table

 Table 1: Sample Size distribution of the Medical Professionals in Zaria

 Metropolis

	•	
S/N	Selected Hospitals	Sample Size
1	Ahmadu Bello University Teaching Hospital	78 (61.4%)
	Zaria (ABUTH)	
2	Hajiya Gambo Sawaba General Hospital, Zaria	31 (24.4%)
3	Almedina Hospital, Sabon Gari	18 (14.2%)
	Total	127 (100%)

Source: Field Work (2023)

A sample size of 127 Medical Professionals participated in the study. This ensured that about 35% of the hospital Medical Professionals participated in the study to have a more manageable and representative sample size that can minimize sampling biases and consequently, get reliable findings. Units such as the Maternity/Anesthesia Clinic, Medical Wards (Pediatrics, Female & Male), Out Patient Department (GOPD, SOPD, MOPD & POPD) and Surgical Wards (Pediatrics, Female & Male) had the most participants in the sample size. On the other hand, units such as psychiatric and Public/Community Medicine had fewer participants because they had fewer Medical Professionals.

Data Presentation and Analysis

A total of one hundred and twenty-seven (127) Questionnaires were distributed to respondents out of which one hundred and twenty-one (121) questionnaires were duly filled and returned making a 91% response rate, this is attributed to constant physical, phone calls and chats follow up by the researcher. The analysis was based on simple frequency and percentages. The decision mean is 2.5 and 3.0 on the Likert scale.

Table 2:	Level	of Awar	eness A	mong Me	dical Pr	ofessionals 1	regarding
Telemedic	ine Serv	vices in	Selected	Hospitals	in Zaria	Metropolis	Kaduna
State Nige	ria.						

Awareness	Level of Agreement				Average	
among Medical	Strongly	Agree	Disagree	Strongly	Total	Mean
Professionals	agree			Disagree		
I am aware of	99	22	0	0	121	3.82
Telemedicine	(81.8%)	(18.2%)	(0.0%)	(0.0%)	(100%)	
I utilize	10	05	90	16	121	2.10
Telemedicine	(08.3%)	(04.1%)	(74.4%)	(13.2%)	(100%)	
daily						
Telemedicine	80	12	20	09	121	3.94
facilitates	(66.1%)	(09.9%)	(16.5%)	(07.5%)	(100%)	
medical care in						
our daily routine						
Telemedicine	78	14	21	08	121	3.69
enhances the	(64.5%)	(11.6%)	(17.3%)	(06.6%)	(100%)	
quality and						
response time for						
diagnosis of a						
patient						
Telemedicine	70	20	18	13	121	3.21
ensures adequate	(57.9%)	(16.5%)	(14.9%)	(10.7%)	(100%)	
medical care						

Source: Field Work (2023)

Table 2 assesses the level of awareness and perceptions of Medical Professionals in selected hospitals in Zaria Metropolis regarding Telemedicine Services. The finding is based on five statements, with corresponding response categories and the Mean of respondents who selected each option. The first statement reveals that an overwhelming majority of respondents strongly agree that they are aware of Telemedicine Services in the Medical Care facility with a Mean value of 3.82. In the second statement, it was shown that the majority of the respondents Disagree with the utilization of Telemedicine daily with a Mean of 2.10 which is below the decision mean. The third statement indicates that the majority of the respondents strongly agree that Telemedicine facilitates medical care in their daily routine with a mean of 3.94. The fourth statement reveals that the majority of respondents strongly agree that Telemedicine enhances the quality and response time for diagnosing patients with a mean of 3.69, indicating high confidence in the system's effectiveness. The final statement reveals that the majority of the respondents believe that Telemedicine ensures adequate medical care, emphasizing the importance of Telemedicine in maintaining comprehensive medical care.

Ethical, Legal & Level			Agreement	Average		
Regulatory	Strongly	Agree	Disagree	Strongly	Total	Mean
considerations	Agree	-	-	Disagree		
Informed consent	100	21	00	00	121	3.83
	(82.6%)	(17.4%)	(0.0%)	(0.0%)	(100%)	
Patient privacy	98	20	03	00	121	3.79
and	(81.0%)	(16.5%)	(02.5%)	(0.0%)	(100%)	
confidentiality						
Access to Care	90	12	10	09	121	3.51
	(74.4%)	(09.9%)	08.3%)	(07.4%)	(100%)	
Professional	84	19	09	00	121	3.40
Conduct	(69.4%)	(15.7%)	(07.4%)	(0.0%)	(100%)	
Licensure and	90	20	08	03	121	3.63
Credentialing	(74.4%)	(16.5%)	(06.6%)	(02.5%)	(100%)	
Malpractice	78	21	06	06	121	3.25
insurance	(64.5%)	(17.5%)	(05.0%)	(05.0%)	(100%)	
Data Protection	79	18	14	10	121	3.37
	(65.3%)	(14.9%)	(11.6%)	(08.3%)	(100%)	
Reimbursement	70	21	19	11	121	3.24
	(57.8%)	(17.4%)	(15.7%)	(09.1%)	(100%)	
Prescribing	95	16	10	00	121	3.70
authority	(78.5%)	(13.2%)	(08.3%)	(0.0%)	(100%)	
Quality of care	96	25	00	00	121	3.79
	(79.3%)	(20.7%)	(0.0%)	(0.0%)	(100%)	

 Table 3: Level of Ethical, Legal and Regulatory considerations associated

 with the use of Telemedicine Services

Source: Field Work (2023)

Table 3 presents the respondents" responses on the level of ethical, legal and regulatory considerations associated with the use of Telemedicine Services. The findings show that the majority of the respondents strongly agree that they seek Informed consent of Patients with a Mean of 3.83, the majority of the respondents strongly agree that Patient privacy and confidentiality are protected and the Quality of care is provided with a Mean of 3.79 each. Furthermore, the majority of the respondents strongly agreed that they have Prescribing authority with a Mean of 3.70.

Challenges and		Average				
Barriers	Strongly	Agree	Disagree	Strongly	Total	Mean
	Agree	_	_	Disagree		
Limited access	99	20	02	00	121	3.80
to technology	(81.8%)	(16.5%)	(01.7%)	(0.0%)	(100%)	
Privacy and	100	21	00	00	121	3.83
security	(82.6%)	(17.4%)	(0.0%)	(0.0%)	(100%)	
concerns						
Malpractice	80	20	11	10	121	3.41
concerns	(66.1%)	(16.5%)	(09.1%)	(08.3%)	(100%)	
Technical issues	85	09	12	15	121	3.36
	(70.3%)	(07.4%)	(09.9%)	(12.4%)	(100%)	
Cultural and	30	20	60	11	121	2.57
language	(24.8%)	(16.5%)	(49.6%)	(09.1%)	(100%)	
barriers						
Licensing Issues	79	11	18	13	121	3.29
-	(65.3%)	(09.1%)	(14.9%)	(10.7%)	(100%)	
Inadequate	70	20	18	13	121	3.21
connectivity and	(57.9%)	(16.5%)	(14.9%)	(10.7%)	(100%)	
Reimbursement	90	10	11	10	121	3.45
and payment	(74.4%)	(08.3%)	(09.1%)	(16.5%)	(100%)	
issues	. ,					
Regulatory	70	10	31	10	121	3.16
Issues	(57.9%)	(08.3%)	(25.6%)	(16.5%)	(100%)	
Resistance from	90	10	18	03	121	3.55
Medical Care	(74.4%)	(08.3%)	(14.8%)	(02.5%)	(100%)	
providers			. ,			

Table 4 Challenges to the Adoption of Telemedicine Services in SelectedHospitals in Zaria Metropolis

Samaru Journal of Information Studies Vol. 24 (2	2) 2024
--	---------

Digital literacy	50	20	38	13	121	2.88	
	(41.4%)	(16.5%)	(31.4%)	(10.7%)	(100%)		
	1 (2022)						

Source: Field Work (2023)

Table 4 presents responses on the challenges to the adoption of Telemedicine services by medical professionals in selected hospitals in Zaria Metropolis. The findings reveals that majority of the respondents strongly agree that Limited access to technology and Privacy and security concerns are the major challenges hindering the utilization of Telemedicine in Zaria Metropolis with a Mean of 3.83 and 3.80 respectively.

Discussion

Table 2 suggests a high level of awareness and positive perceptions among Medical Care professionals regarding Telemedicine, reflecting its significant role in their daily routines and patients. It shows that a high percentage of respondents are aware of Telemedicine even though they do not utilize it daily, and believe it positively impacts patient diagnosis. This is in line with the findings of the Federation of State Medical Board (FSMB) (2022) where it was found that Telemedicine is an emerging technology in the health sector across the globe. Therefore, it is required for a study to be conducted to ascertain the health professionals' and patients' awareness and their attitude towards Telemedicine. Table 3 revealed that the rapid advancement of information and communication technologies (ICT) has revolutionized Telemedicine, offering a convenient and accessible alternative to traditional in person Medical Care services these ethical, legal, and regulatory considerations have been be carefully addressed to ensure patient safety, and privacy, and the quality of care. The finding is contrary to research by the Federation of State Medical Board (FSMB) which shows that for informed consent patient documentation, health provider, type of telemedical treatment to be received, recognition of the medical practitioner's right to decide how appropriate it is to use Telemedicine to manage an ailment, security o health records and information, privacy risks associated with the use of Telemedicine, not holding the service providers blameworthy if the information is lost due to technical issues and permission of patient before information are sent to third parties. Table 4 reveals that the majority of the respondents strongly agree that Limited access to technology and Privacy and security concerns are the major challenges, Tygerberg Children Hospital, (2003), affirmed that limited technology, costs and compatibility with the cost of Telemedicine equipment, such as video conferencing cameras and specialized medical devices, can be

prohibitive for some Medical Care providers and patients, additionally, compatibility issues.

Summary of Findings

The study reveals that the majority of Medical Professionals are fully aware of Telemedicine Services in Zaria Metropolis even though they don't utilize it on daily basis. It also show that the majority of Medical Professionals in Zaria Metropolis seek informed consent of patients while utilizing Telemedicine Services and that Patient privacy and confidentiality is protected. Furthermore, the findings reveal that Limited access to technology and Privacy and security concerns are the major challenges hindering the utilization of Telemedicine Services by Medical Professionals in Zaria Metropolis.

Conclusion

Adoption of Telemedicine by Medical Professionals in Zaria Metropolis has several benefits, including increased access to care, improved quality of care, reduced costs, increased efficiency and effectiveness, improved patient satisfaction, and the potential to revolutionize the delivery of Medical Care in Zaria Metropolis even though some challenges needed to be looked at.

Recommendations

The study recommended that efforts should be made to encourage the use of Telemedicine Services by Medical Professionals in Zaria Metropolis daily due to the numerous benefits of creating more awareness. Also, Medical Professionals in Zaria Metropolis should be encouraged to work more on Professional Conduct, Malpractice insurance, Data Protection and Reimbursement to patients and Medical Care providers should give more access to technology, Privacy and security as well as encouraging the use of Telemedicine Services.

References

American Medical Association. (2023). 2023 Telehealth Survey Report. Retrieved from <u>https://www.ama-assn.org/system/files/2023-telehealth-survey-report.pdf</u>

Bashshur, R. L., & Shannon, G. W. (2009). History of Telemedicine: Evolution, context, and transformation. New Rochelle, NY: Mary Ann Liebert, Inc.

- Bashshur, R. L., Shannon, G. W., & Krupinski, E. A. (2013). The taxonomy of Telemedicine. Telemedicine and e-Health, 19(10), 766-768.
- Cartwright, M., & Hirani, S. P. (2013). E-health: current status and future directions in Telemedicine.
- De la Torre-Díez, I., López-Coronado, M., & Vaca, C. (2015). Aguado, J. S. To telemedicate or not to telemedicate: A review of the costs and benefits of Telemedicine. Journal of Medical Care engineering, 6(1), 11-28.
- Haque, M. R., & Rahman, N. A. (2020). Exploring the role of ICT in the advancement of Telemedicine: A systematic review. Journal of Telemedicine and Telecare, 26(9), 507-515. <u>https://doi.org/10.1177/1357633X19876268.</u>
- Hau YS, Kim JK, Hur J, Chang MC: How about actively using Telemedicine during the COVID-19 pandemic?. J Med Syst. 2020, 44:108. 10.1007/s10916-020-01580-z.
- Hollander, J. E., & Carr, B. G. (2020). Virtually perfect? Telemedicine for Covid-19. New England Journal of Medicine, 382(18), 1679-1681. <u>https://doi.org/10.1056/NEJMp2003539</u>
- Ibrahim, S. M. (2013). Data collection Tools in Research methodology: a step by step Guide for Beginners. (3rded.). London: Sage.
- Institute of Medicine. (2011). Health IT and patient safety: Building safer systems for better care. Washington, DC: The National Academies Press.
- InTouch (2021). The future of Telehealth in the U.S. and across the globe. International Telecommunication Union. (2017). Measuring the Information Society Report 2017 Volume 1. Geneva: International Telecommunication Union.
- Javanbakht, M., Amirmazaheri, M., Hadian, A., & Afshar, H. L. (2014). Telemedicine: A systematic review of economic evaluations. Medical journal of the Islamic Republic of Iran, 28, 142.

- Moulaei K, Shanbehzadeh M, Bahaadinbeigy K, et al. (2022) Survey of the patients' perspectives and preferences in adopting telepharmacy versus inperson visits to the pharmacy: a feasibility study during the COVID-19 pandemic. BMC medical informatics and decision making. 22;99:1–10
- Ohannessian, R., & Hovanessian, M. (2017). Comparison of the quality of care in Telemedicine with in-person care: A meta-analysis. Journal of Telemedicine and telecare, 23(3), 452-460.
- What Is Telehealth?. (2018). <u>https://catalyst.nejm.org/doi/full/10.1056/CAT.18.0268</u>. Telemedicine: A Guide to Assessing Telecommunications in Health Care. Field MJ (ed): National Academies Press, Washington, DC; 1996. 10.17226/5296.
- World Health Organization. (2010). Telemedicine: Opportunities and developments in member states: Report on the second global survey on eHealth. Retrieved from https://www.who.int/goe/publications/goe_telemedicine_2010.pdf
- Wootton R. Recent advances in Telemedicine. British Medical Journal. 2001;323:557–60.
- Wootton, R. (2012). Twenty years of Telemedicine in chronic disease management--an evidence synthesis. Journal of Telemedicine and telecare, 18(4), 211-220.

World Health Organization. (2010). Telemedicine: Opportunities and developments in Member States. Geneva: World Health Organization.Yellowlees, P., Odor, A., & Parish, M. B. (2018). Telemedicine in the 21st century: The transformation of an ancient art into modern Medical Care. Oxford University Press.