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KNOWLEDGE AND PERCEPTION OF TELEMEDICINE AMONG HEALTH PROFESSIONALS AT THE KOFORIDUA REGIONAL HOSPITAL, GHANA

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Abstract: **Telemedicine is a good educational medium that paves the way for continuing education or medical training for health care providers in isolated rural areas, who may not have the opportunity or time to travel to a big city and participate in professional training programs and workshops. The main objective of the study was to assess the knowledgebase and perception of Telemedicine among health professionals. This study was a non-experimental, descriptive study which employed a simple random sampling technique in selecting 100 health professionals at the Koforidua Regional Hospital in the Eastern region of Ghana. The study concluded that respondents are willing to work with telemedicine should it be introduced and will prefer in-service training as a way of learning new methods. Participants generally had a fair idea of telemedicine. Although, some of health professionals think ICT does not hinder healthcare delivery, the rampant power cut rather slows down the process.**

Keywords: **Telemedicine, Knowledge, Perception, Information, Healthcare, Communication**.

I. INTRODUCTION

Telemedicine has the ability to bridge gaps and overcome barriers that are unthinkable to traditional forms of healthcare. A key challenge in today's healthcare organization is concerns of client's satisfaction. Telemedicine projects could be very significant in curbing this challenge and things look positive with the number of these projects increasing at a dramatic rate [1].

Access to healthcare and medication is a challenge for the majority of people living in developing countries like Ghana. In an effort to strengthen human resources in rural areas and to improve the quality of primary healthcare, the Novartis Foundation for Sustainable Development (NFSD), in cooperation with the Millennium Villages Project (MVP), the Ministry of Health and the Ministry of Communications in Ghana, National Health Insurance Agency- Ghana, Ghana Health Service, and Ghana Medical Association, initiated a Telemedicine Project in Bonsaaso in Ghana. The objective of the project is to improve access to primary healthcare by using information and communication technologies (ICTs) to overcome geographical barriers. This pilot aimed to expand the provision of a scalable and sustainable service at the national level.

Knowledge sharing among different healthcare practitioners is an indispensable, accepted, and common practice across the world. Professional knowledge sharing among health professionals is significant to enhancing the quality and efficiency of patient care in health care facilities [2][3]. Additionally, it is essential that health care providers keep abreast

of medical advances and new medical information through reading medical journals, attending medical lectures, conferences, and workshops[4]. However, it may not be possible for all health care providers in Ghana, especially those who live in rural and remote areas. These is what Telemedicine brings to the table.

The study is to assess the knowledge and perception of healthcare professionals at the Koforidua Regional Hospital, Ghana about telemedicine and how it's successful implementation could enhance healthcare delivery.

II. METHODOLOGY

A. Research Design:

The research design that was used in the survey was mainly quantitative study.

B. Research Setting:

The hospital is located in Koforidua, the capital town of Eastern Regional of Ghana. The Koforidua Regional Hospital has many departments thus, the Intensive Care Unit, Outpatient Department, Medical Ward, Paediatric ward, Surgical ward, Obstetric and Gynaecological Unit, a Laboratory Centre, a Theatre, and a Mortuary.

The hospital has a bed population of 350 for in-patients on admission. The Koforidua Regional Hospital has a total of 57 Doctors and 320 nurses. The hospital has an average of 850 outpatients received every week.

C. Sample Size Sampling Technique:

The sample size for this study was hundred (100). Out of the population of 417; 100, (thus almost one quarter of the population) were chosen as the sample size. The sample was obtained by using the convenience non-probability sampling method where the most readily available health professionals was taken as the sample units for the study.

D. Method of Data Collection:

Questionnaires were administered respondents who were assisted to fill where necessary. The questionnaires were made up of four (4) sections. First section seeks socio-demography characteristics of respondent, second section on knowledge on telemedicine. Third and fourth sections ask questions on perception and acceptance of telemedicine.

E. Method of Data Analysis:

The quantitative data that was gathered was entered and analyzed with SPSS version 16 to obtain tables. Pie charts and tables were used to illustrate the data for easy interpretation.

III. RESULTS AND DISCUSSION

A. Demographic Characteristics:

TABLE I: DEMOGRAPHIC DATA

Demography	Frequency	Percentage
Age of Respondent		
20-30	35	35
31-40	39	39
41-50	21	21
Above 50	5	5
Sex of Respondent		
Male	48	48
Female	52	52
Work experience of respondent		
1-5	50	50
6-10	15	15
11-15	15	15
15-20	10	10
Above 20	10	10
Department of Respondent		
Paediatrics	15	15
Medical	25	25

Surgical	25	25
ICU	5	5
Out-Patient Department	5	5
Dental	4	4
Pharmacy	4	4
Imaging and Radiology	7	7
Administration	10	10
Profession of Respondent		
Medical Officers	10	10
Physician Assistants	10	10
Nurses	52	52
Paediatricians	4	4
Pharmacists	4	4
Radiologists	7	7
Dental Therapists	3	3
Administrative Officers	10	10
Total	**100**	**100**

The findings of the research revealed that majority 76% of the respondents were within the ages of 20-50 whilst workers above 50 years were 26% with 52% representing females whilst 48% were males. The respondents have varying working experiences with 50% working for the past 1-5 years whilst 15% have worked for either 6-10 or 11-15 years and 10% have worked for either the past 16-20 or more than 20 years.

Also, most of the respondents (52%) were nurses. 10% represented medical officers, Physician Assistants or Administrative Officers whilst 7% were radiologists. 4% were either paediatricians or pharmacists with 3% being dental therapists.

This finding is essential in the application of telehealth as supported by Loane & Wotton, (2001) that staff may utilize those skills to take digital images of microscopic specimens, radiographs, wounds and skin lesions to store on laptops or desktop computers and then transmit through emails to a specialist for further consultation and management. Studies have shown that digital images transmitted through an electronic medium to specialists is feasible in both advanced and developing countries[5][6].

B. Knowledge of Health Professionals on Telemedicine:

TABLE II: KNOWLEDGE ON TELEMEDICINE

Indicators	Freq	Percent
Have Respondent heard of telemedicine		
Yes	100	100
No	0	0
Meaning of telemedicine in respondents view		
The use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health.	65	65
IT-based innovation that support and enhance physician- patient care as and improve health-care organizations' competitiveness	35	35
No idea		
Telemedicine can help to capture and store information for future		
Yes	80	80
No	20	20
Telemedicine can help in investigations, diagnosis and treatment		
Yes	90	90
No	10	10
Telemedicine disseminate patient health information from one department to another		
Yes	90	90
No	10	10
Total	**100**	**100**

All the respondents that's 100% (100) have heard of telemedicine before which is similar to the study conducted in Medical school of Ahmadu Bello University, Zaria, Nigeria [7] and a bit lower than a study conducted in India (58%) [8]. Also 65% (65) defined telemedicine as the use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health whilst 35% (35) also defined it as an IT-based innovation that support and enhance physician- patient care as and improve health-care organizations' competitiveness. This definitions are similar to Field's definition of telemedicine in which he defined telemedicine as the "use of electronic information and communications technology to provide and support health care when distance separates the participants" [9]. Other literature reiterate that telemedicine has proven to be a useful medium for a better access to health care facilities in rural areas as well as in emergency situations; for example, telemedicine can be applied as an effective tool for providing specialized emergency health care services for both man-made and natural disaster-related emergencies, such as earthquakes, volcano eruptions, fires, explosions, and so on [10][11].

With respect to this study, 80% (80) of respondents said telemedicine can help to capture and store information for future whilst 90% (90) respondents taught telemedicine can help in investigations, diagnosis and treatment with another 90% (90) respondents say telemedicine disseminate patient health information from one department to another.

C. Source of Respondents' Knowledge on Telemedicine:

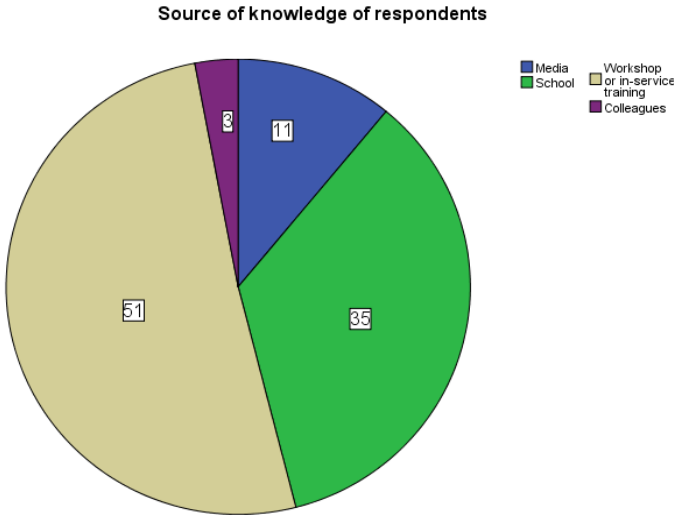

Fig. 1: Source of Knowledge

With regards to their source of knowledge, 51% (51) respondents got the information from workshops and in-service trainings that were conducted whilst 35% (35) respondents got it at school as part of the academic curriculum. This is in line with a study conducted in King Abdul-Aziz Medical City, Saudi Arabia where the levels of IT applications' knowledge and training showed that about two-thirds of the respondents attended training courses in information applications [8].

D. Perception of Respondents towards Telemedicine:

TABLE III: PERCEPTION ON TELEMEDICINE

Indicators	Freq	Percent
Power cut distort the process of working with ICT		
Strongly agreed	25	25
Agreed	50	50
Strongly disagreed	15	15
Disagreed	10	10
Developed countries use ICT because of good internet access		
Strongly agreed	13	13
Agreed	20	20
Strongly disagreed	24	34
Disagreed	43	33

ICT is only beneficial to the educational and financial sectors		
Strongly agreed	25	25
Agreed	40	40
Strongly disagreed	20	20
Disagreed	15	15
Total	**100**	**100**

An examination of respondents' perception on telemedicine, most of them agreed on the various usage of ICT by the health professions.

From Table 3 above, 25% (25) of the respondents strongly agreed that when there is power cut ICT processing slows down, 50% (50) agreed which was the majority, 15% strongly disagreed, and 10% disagreed. 13% (13) of the respondents strongly agreed that ICT can be used by health professionals in developed countries because of good access to internet, 20% (20) agreed, 24% (24) strongly disagreed which was the majority , and 43% (43) disagreed.

Out of 100 respondents, 25% strongly agreed that ICT is beneficial to educational and financial sector, 40% agreed, 20% strongly disagreed, and 15% disagreed.

75% (75) of the respondents agreed that power cut often slows or inhibits ICT processing and hence it's functioning. This is in line with a study conducted in Ghana where respondents said they do not usually use ICT because of power cut as it slows down work progress[12].

E. ICT slows down health service delivery:

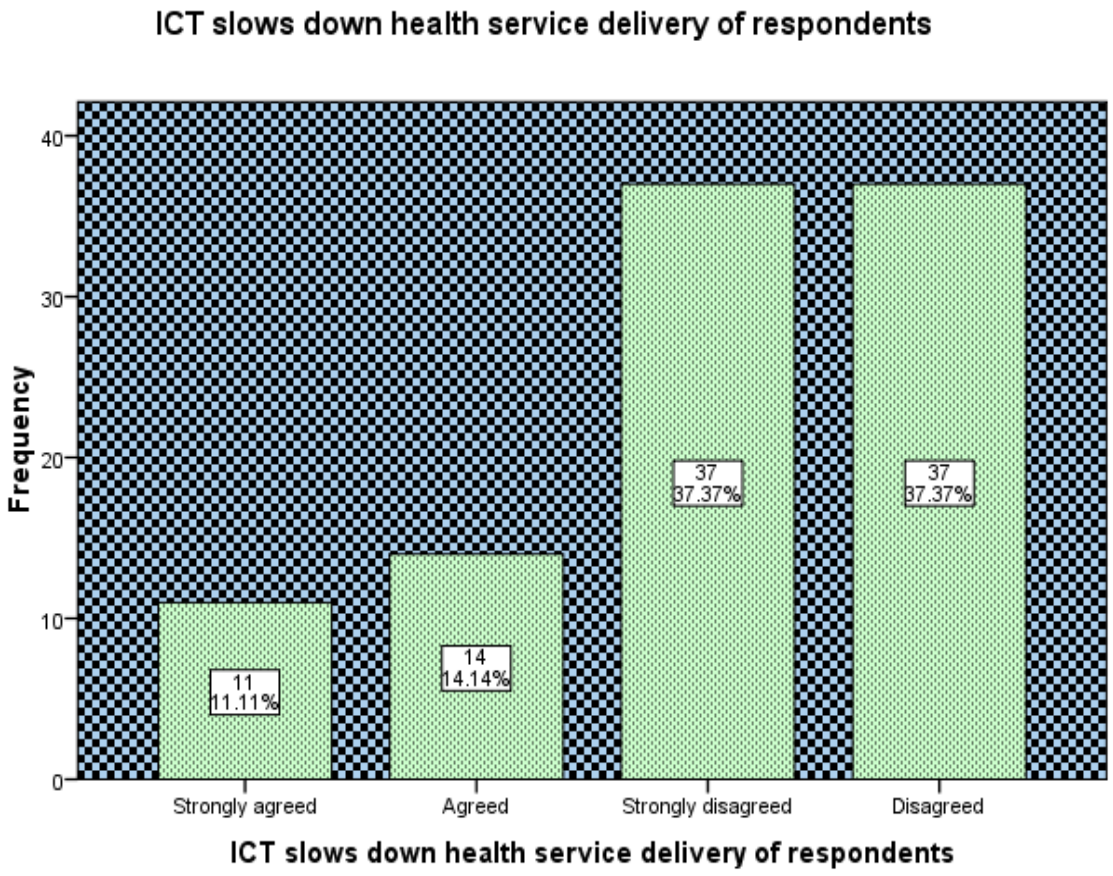

Fig. 2: ICT slows down health service delivery

From Figure 2, out of 100 respondents, 11% strongly agreed that ICT slow down health service delivery, 14% agreed, 37% strongly disagreed, and 37% disagreed. This is in line with Busagala and Kawono's research (2013), where 48.5% of respondents who are healthcare workers agree that ICT speeds up the processes of health service delivery.

E. Readiness of Health Professionals In Relation To Telemedicine:

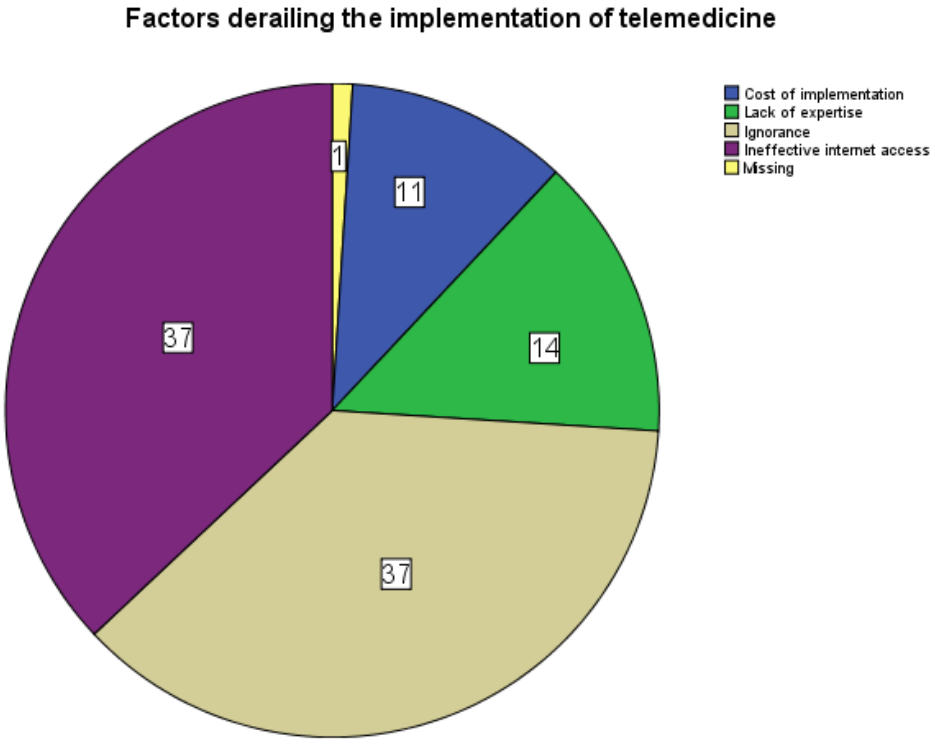

Fig. 3: Factors derailing the implementation of telemedicine

Ghana is still behind because of infrastructural issues that confronts the nation in respect to telecommunications. Other challenges include unstable power supply, inadequate telecommunication facilities, lack of finances to operate using ICT tools, and lack of personnel were all sought after and majority of the respondents agreed that these are the major barriers to the adoption of ICT in health care delivery. According to the study, 37% (37) of respondents believe the derailing of the implementation of telemedicine is as a result of ignorance or ineffective internet access whilst 14% feel it is due to lack of expertise, and 11% (11) think is due to cost of implementation**.**

IV. CONCLUSION

Mutusitz and Breen (2007) categorize advantages of telemedicine "according to five main abilities: the ability of telemedicine to (a) transcend geographical boundaries; (b) transcend temporal boundaries; (c) reduce costs; (d) increase patient comfort, security, and satisfaction; and (e) digitize health communication via Web-based services" (p. 76). In addition, Hjelm (2006) mentions that some of the potential advantages of telemedicine are "improved access to information; provision of care not previously deliverable; improved access to services and increasing care delivery; improved professional education; quality control of screening programmes; and reduced health-care costs" (p. 135). The findings of the study revealed that all the respondents had prior knowledge of telemedicine with most of them getting the information from workshops and in-service trainings' that were conducted. Assessing age, gender, and working experiences to measure knowledge and perception of telemedicine the results clearly showed that younger and male respondents below the age of 50 years used computers more frequently compared to female staff and those over 50 years of age. They showed positive attitudes towards adopting new technology and respondents preferred in-service training as a way of learning over other methods.

An examination of respondents' perception on telemedicine, most of them agreed on the various usage of ICT by the health professions although it was also pointed out that, Ghana is still behind because of infrastructural issues with respect to telecommunication technology. Other challenges includes unstable power supply, lack of knowledge and ineffective access to ICT, lack of finances in operating ICT tools, and lack of personnel. Majority of the respondents agreed that these are the major barriers to the adoption of ICT and hence telemedicine in health care delivery.

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