

# **E-HEALTH READINESS OF HEALTHCARE PROVIDERS IN GHANA: A QUALITATIVE COMPARATIVE STUDY OF TWO HOSPITALS IN ACCRA.**

## **Abstract**

E-health has become an innovation of interest in many healthcare organisations due to its numerous advantages. This study aimed at empirically assessing the nature of e-health in LEKMA Hospital and Nyaho Medical Centre and examined the factors that determined e-health readiness. The study used a qualitative design and a comparative approach through the use of interviews and focus group discussions to collect qualitative data from 32 healthcare staff in the two facilities. The study found that Nyaho Medical Centre had an advanced system which runs effectively and efficiently compared to the LEKMA Hospital. Also, core/technological, structural, and societal issues determined e-health readiness in the health facilities. In effect, we argue among other things that government must invest in the technological infrastructure of public hospitals. This is necessary for these facilities to deliver healthcare that is efficient, accelerated and based on improved information sharing abilities.

**Key words:** Healthcare; e-health; readiness; information technology.

## **1. Introduction**

Undoubtedly, the health sector is one of the most significant sectors in any country's economy. A country that has poor health systems and policies is bound to experience poor economic growth as productivity of citizens might be greatly affected when they fall sick or die from curable medical conditions (Mugo & Nzuki, 2014). In this regard, most governments over the world are putting in rigorous actions to deliver the state-of-the-art health infrastructure for their citizens. Despite these developments, the health sector is still facing numerous challenges. Some of these challenges include lack of qualified doctors, lack of funds to equip health institutions with modern technologies, high cost of health care services unreasonable to majority of the populace among others (Currie & Finnegan, 2009). Reducing health care expenditure and providing quality health care have become a world-wide priority (Wickramasinghe, 2000). In view of this, technology and automation are potential factors, which contribute to reducing these costs (Wickramasinghe & Misra, 2004).

The proliferation and widespread use of Information and Communication Technologies (ICT) have permeated almost all aspects of our social lives. Every facet of our lives today depends on the tremendous use of ICT, and the healthcare sector is no exception. Health information systems were introduced to fully utilise especially the internet in providing better healthcare (Almunawar & Anshari, 2012). There is no doubt that the health sector has revolved tremendously over the last couple of years. The nature of the healthcare industry has changed from a comparatively

stable industry to what we see today as a dynamic one. Different Health Information Systems (HIS) have evolved overtime and deployed through various kinds of technologies. The process of automating the medical enterprise has been underway for five decades, when the first electronic health record (EHR) was introduced (Langabeer & Champagne, 2013), hence the concept of automating health records is not new.

Mugo and Nzuki, (2014) argued that limitations of paper-based records are influencing a transition across the globe towards Electronic Health Records (EHRs) and in general electronic health (eHealth). This is because in most developing countries, recording of patient information in many hospitals has been on papers (Mugo & Nzuki, 2014). In reference to this, Miller *et al.*, (2005) argued that some limitations of the paper based records include illegibility, ambiguity, incomplete data, poor availability, and data fragmentation. Similarly, Jennett *et al.*, (2005) outlined some challenges that have been cited to impact negatively on adoption of ICT in the health sector in developing countries. These include: scarcity of resources, poor telecommunication infrastructure, poor internet connectivity and non-technological issues such as organisational factors, human elements, policy and standards and socio-economic issues (Adjorlolo & Ellingsen, 2013). Lærum *et al.*, (2003) further postulate that recording of patient information on papers impedes the continuity and quality of care for patients. This and many other reasons call for electronic information systems to streamline the activities of hospitals. However, the readiness of a health institution to adopt e-health systems is very crucial to the success of any e-health initiative.

By its definition, e-Health readiness refers to the preparedness; or the awareness of health-care institutions to implement programmes that involve use of Information and Communication Technology (ICT) in provision and management of health services. Li and Seale, (2012) stated that, the level of preparation in technological innovation and also the drive to embrace new technologies could be perceived as readiness. Blaya *et al.*, (2010) emphasises that the introduction of e-health technology into a healthcare organisation is regarded as an innovation and adoption of information technology. Blaya *et al.*, (2010) further states that any innovation into a community or system requires the community or system to adapt to the changes when such innovation is introduced. The level of readiness depends on a number of factors that lead to success or failure of e-health programmes, and thus increase or decrease hope of achieving the desired results (Khoja *et al.*, 2007).

The readiness of a health institution to carry out an e-health project according to Campbell *et al.*, (2001) depends on six themes;

- Turf: a threat to healthcare providers' livelihood or professional autonomy or both;
- Efficacy: desire to know that E-Health applications will fill a functional need in healthcare providers' practice before they invest time and money in making such a big change;
- Practice context: barriers to adopting E-Health applications;
- Apprehension: as a human aversion to change;
- Time to learn: hesitancy among the providers to take the time to learn a new technology and to persuade patients of its worth;
- Ownership: participants who were professionally and emotionally invested in the technology – stakeholders who acknowledged its benefits, adapted it to their needs, and tried to help others learn.

These themes reveal that e-health can only be carried out depending on the opportunities it provides to the organisation, the need to solve a health need, the impediments against e-health, resistance to change, time to learn and transfer knowledge to clients, the willingness of stakeholders to invest into the technology.

Li and Seale, (2012) also identified the preparedness of healthcare institutions for changes that are caused by ICT innovations as a key element for an institution to be equipped for e-health. They further acknowledged that for e-health to be successful, readiness assessment should be carried out so as to understand and mitigate the challenges that are likely to be presented by e-health implementation. They emphasised that, by understanding the obstacles an action could be taken to address areas that could lead to unacceptable readiness. The degree of change therefore needs to be assessed to evaluate the readiness for new innovation.

Research needed to understand if health institutions are in a position to carry out an effective and efficient e-health system. However, research in Ghanaian health institutions have for the most part failed to assess available infrastructure for e-health adoption and the factors that determine e-health readiness in primary care. The evaluation of e-health readiness in developing countries such as Ghana has become very essential looking at the enormous benefits that the health sector in such countries stand to benefit. In light of the foregoing, we sought to assess e-health readiness in a private and a public healthcare facility in Accra using a comparative lens. Specifically, we sought to:

- i. investigate the nature of health information technologies at the Nyaho Medical Center and the LEKMA hospital.
- ii. explore the determinants e-health readiness at the Nyaho Medical Center and the LEKMA hospital.

## **2. Materials and Methods**

### *2.1 Study Design*

The study employed a qualitative design with a comparative approach. Studying a concept (e-health readiness) that has attracted little research attention in Ghana, we thought it was necessary to use a more exploratory approach that will help us provide a more in-depth understanding of the nature of e-health readiness in the study facilities. Moreover, the comparative approach was adopted to further enhance our understanding of e-health in private and public institutions.

### *2.2 Population, Sample Size and Sampling Techniques*

The study population was the staff of Nyaho Medical Centre and the Ledzokuku Government Hospital (LEKMA), both situated in Accra, the national capital of Ghana. The ideal sample size for qualitative studies with homogeneous participants is 15–20 (Crouch & McKenzie, 2006; Green & Thorogood, 2009). In view of this we used both convenient and purposive sampling techniques to select 16 respondents from each facility making a total of 32 respondents. Staff were selected for the interviews based on their availability and willingness to be part of the study while the Medical superintendents and Administrators were purposively sampled for the study.

### *2.3 Data Collection Instruments and Procedures*

To collect primary data through face to face interviews with respondents, a semi-structure interview guide was used. The use of a semi-structured interview guide was important to this study since it allowed the researchers to illicit relevant information from respondents and also provided the flexibility needed to vary the direction of the interview at any point in a session. Also, a focus group guide was used to conduct focus group discussions. The guide helped the moderation of the discussions to bring out relevant information for the study. The interviews were conducted in the offices of the respondents and in cases where a respondent did not have a designated office in the facility that would ensure privacy, a designated place that served this purpose was used. The focus group discussions were held in a conference room in the facilities. The researchers used materials such as tape recorder, field notebook, encyclopedia, quetext and grammarly. The tape recorder was used to record conversations between the researchers and the respondents and where respondents declined to be recorded, the field note book was used to jot down responses of respondents. The encyclopedia and the grammarly were used to correct spelling mistakes and grammatical errors whilst the quetext was employed to check plagiarised contents. All interview and group discussion sections were moderated by the first author. The second author was in charge of recording the sessions and the third and fourth authors took notes on the sessions. After each session, the research team inspected the notes taken and based on the responses received the next session was planned. The interviews lasted between 25 and 30 minutes and the focus group discussions lasted between 45 and 60 minutes.

#### *2.4 Data Processing and Analysis*

The audios from the tape recorders were played several times by the first and second authors and transcribed manually into a Microsoft excel sheet. They were then given to the third and fourth authors for verification of the accuracy of the transcriptions. In presenting the results, the researchers employed descriptive narrations supported by quotes from the respondents.

#### *2.5 Ethical Considerations*

Participants were included in the study only after they had given their consent to take part in the study. To ensure privacy and confidentiality, the researchers kept all data collected in a well secured locker of the first author. To ensure that participants are protected, the hospital administrators, heads of units and Medical Superintendents/Chief Executive Officers of the two facilities were referred to as management members. This was done because the above positions were held by one person so referring to any of them might reveal the identity of the holder of the position. To differentiate one management member from another in the report, they were given pseudo names such as MML1, which means management member at LEKMA Hospital and MMN1, which means management member at Nyaho Medical Centre and the numbers differentiate any two respondents in the same facility.

### **3. Results**

#### *3.1 Nature of E-Health*

The results on the nature of e-health in the two facilities have been presented separately; first is that of LEKMA hospital and second is that of Nyaho Medical Centre.

### 3.1.1 Nature of e-health in LEKMA Hospital

LEKMA Hospital is a government health institution built by the Chinese in 2010. Their system of Administration, record keeping, dispensing and booking appointments thrive on an electronic health information system. The implementation of e-health system seems to be a big challenge since there is apathy on the part of staff and patients since they are all used to the paper-based system of handling health information.

When asked about the existing records management system, a management member (LMM1) stated that,

*“we moved from manual system of storing and sharing records in 2015 to a more effective efficient way of storing and sharing records called the Public Health Information Systems (PHIS) which launched just last year.”* According to him this action was necessitated because of the *“growing use of Information and Communication Technology in our society”*

This means people will be willing to adapt to the system easily. When asked the reason and rationale for choosing the PHIS rather than any other system another management member (MML2) revealed that, the system has a *“user friendly interface”* which makes it easier to work with especially among users with differing computing backgrounds. This was done because of the appeal of the hospital which attracts both the poor and rich in the society so to make the system attractive to everyone a user friendly system was instituted. However, the system still lacks completeness since some elements are still missing and this was declared by a pharmacy staff:

*“The world is moving so we also have to move but we still have some of our systems like doctor’s prescription being presented manually instead of electronically so this means we are still making progress”*

This clearly indicates that, even though the hospital has cleared out most part of their manual system of processing and storing records, the system still lacks completeness since some vital parts as doctor’s prescription is still processed manually. The tools employed by the Hospital includes Patient Registration and Records management element, Pharmacy and Dispensary Management element, Service Charges Management module, Billing Management element and e-Folder Management element.

There are numerous challenges LEKMA faces in the application of e-health tools despite the massive improvements over the past year. This ranges from the unwillingness of staff, background of clients, and ownership and management structure as expressed by a respondent:

*“We have clients who are from poor backgrounds and not abreast with use of ICT so running a full e-health program will be very difficult for us but in every change there are sacrifices to be made so we have to educate them more”* (MML1)

The challenges associated with ownership of the facility being government meant that rolling out such a program is not really a priority since there are other government hospitals that need assistance in many areas. This means that government has no priority in tackling such a major issue and the Hospital has to fall on NGOs to provide them with such assistance. However, overreliance on government for such projects is very typical of most government institutions and this kills initiative and dwindles progress. In the words of MML1, *“it takes a lot of effort and time of advocacy before we can get support from government for such a program to be run fully”*.

This clearly shows that government as an owner of the institution is not ready to commit resources to such projects because there are other health institutions that need basic amenities. As it stands, LEKMA Hospital lacks computers which obviously is a major catalyst to help facilitate the smooth operation of this system.

*“We have problems getting the needed support because as it stands the PHIS system is running but under capacity because we lack ICT tools and government is also not committing enough resources to that so we plan on seeking donor support and using part of our internally generated funds to support the full implementation of this project”* (Laboratory staff).

Despite these setbacks, the institution of the system has helped to some extent in the reduction of pressure on the facility and access to patients’ information also is now faster. In this regard, waiting time has reduced and paper work has also reduced making processing of data and storing of information more reliable as expressed by a respondent:

*“We have reduced waiting time significantly because access to records of patients is now easier and faster to access as compared years back when we use to go through pile of sheets just to get information on each patient.”* (Nursing staff).

### 3.1.2 Nature of e-health in Nyaho Medical Centre

Nyaho Medical Centre is a health facility that is characterized by high level of technology right from the reception to the theatre room. In this setting, since the ownership of the institution lies in the hands of a private person change happens faster. Decisions are taken swiftly in order to bring improve care and attract clients.

A management member stated that:

*“in our world we believe that we must be in charge of change and we must see it happen so in conjunction with my team members we act and see ourselves as a health institution providing services to meet international standards and as such all accompanying technologies must be included to make it a reality.”*  
(MMN1)

In his view, there was the need to develop a system that see themselves as providing health care services that matches international standards and therefore, they cannot compromise on the quality of information and technology. In a related comment, a staff at the Business Development Unit also acknowledged and attributed this to fact that their location attracts a lot of elites and this means their services must be reliable and of good quality. In this regard, he stated that

*“We are located in an area that has a lot of elite and those who come around are looking for the best care at stress free level so we must provide that by giving timely information and keeping records that can last for years without interruption.”*

Thus the appeal for the best brings out the best in them and as an institution that lives to satisfy its clients, this is non-negotiable. To Nyaho Medical Centre making the life of patients has led to the adoption of cutting edge technology right from registration to diagnosis. This has significantly reduced waiting time, decongested the hospital and recording and retrieving of records has become friendlier and easier. A management member in this regard expressed that

*“this hospital has grown in terms of ICT, last year 2015 we introduced the Integrated Hospital Information System (IHIS) which has reduced waiting time immensely at the facility.” (MMN2)*

### 3.2 Determinants of E-Health Readiness

This study revealed four main areas of readiness namely that influenced e-health readiness in the two facilities; core/technological readiness, structural readiness, and societal readiness.

#### 3.2.1 Core/Technological Readiness

This refers to the detection of health information needs and the steps being taken to resolve them. As expressed by Li et al., (2008), core readiness has to do with the identification of problems that that arises from documentation of healthcare information and what how comfortable the healthcare provider is with such a system.

According to an administrative staff at LEKMA,

*“At a point in time there was this common agreement based on a general discussion with other members of the hospitals hierarchy on how fast technology was changing the face of health care”.*

The administrative staff gave an account of how patients had to queue all the time for their reports to be located which caused a lot of discomfort because medical processes were done manually. In relation he said stated that:

*“Most of our clients were not happy looking at the situation where they had queue for longer hours I order to be attended to”. This in effect informed the Hospital’s decision at management level to get a solution that “could be used first of all, to process the health insurance claims and to manage other related activities”.*

Therefore, the hospital acquired and installed the Public Health Information System (PHIS) to easily manage its medical procedures and other generated health and administrative records. Although the system is fairly new, it has helped in reducing waiting time to the barest minimum and also ensured sharing of accurate and reliable information. This system was introduced in 2015 and has been functional for some time now

In relation to this, a pharmacy staff at LEKMA revealed that;

*“...The need for us to put a system in place ease pressure in the hospital led to the establishment of an e-health system but I think more education and consultations will have to be done with our partners.”*

This reveals that the technological gap has been filled and there is willingness to bridge it but it will take a lot of dialogues before it can be fully functional. This is because in institutions like this, taking a unilateral decision will breed resistance and may destroy the future of the project even before it is instituted. The decision was taken by management and communicated to the various heads of departments. According to the administrative staff, engaging the unit heads to a larger extent shows the engagement of users in the decision since most changes are advocated for by the unit heads. However, staff meetings were successively held to communicate managements’ intention to procure the system and its relevance to the healthcare delivery in the hospital.

In Nyaho Medical Centre the decision to adopt an e-health system was supported by an adequate budgetary allocation to procure the system. The solution is seen to be quite expensive since financing it was solely the hospitals’ responsibility from its internal generated funds. Budgetary plans were also made by management for the

provision of computers and other logistics for the systems implementation as well as the networking of the facility and future maintenance of the system in the hospital. Staff at the operations unit stated that:

*“For us as an institution we identified the need for a sound medical environment that is stress free so we decided to transform and introduce the Integrated Health Information System (IHIS) and with support of our staff and partners we implemented it.”*

The total support from management, staff and clients made the procurement and implementation of the system successful. This was based on the need to have a system that will eliminate waiting time and also processing and retrieving patients’ data. Thus having a patient who is coming treatment wait in a queue for a very long just to get treated necessitated the procurement of such a system.

*“The problem of people having to wait for long time before they are registered or records are pulled for them and also information sharing created the need for a system to be put in place to tackle it. We discussed it and thought it was a good idea for us to fuse ICT into our work in order to facilitate our processes.”*(Staff at the operations unit)

Drawing from the above discussions it is clear that there is an awareness about the need to resolve medical issues by the introduction of a computerised technology. However, LEKMA hospital’s willingness to resolve such issues has not materialised fully because there are still gaps in the system. Nyaho Medical Centre on the other hand saw the need and with their willingness and support they have implemented the technology to full capacity. This is an indication that, adequate support and funding at the beginning of such projects is key to their successful implementation.

### 3.2.2 Structural Readiness

Structural readiness has to do with the arrangements that are in place to ensure the technology is implemented and enforced successfully. This is what Jennett et al., (2005) explained as the evaluation of structures put in place by the organization and its accompanying human resource structures. A well-functioning IT department together with qualified IT personnel, reliable source of power and internet services are key for the successful implementation of an e-health system. The situation in LEKMA Hospital is one that is characterised by inadequate computers and IT personnel to administer the e-health system in place. This is a situation that is quite a disturbing situation because if care is not taken the system may not live to perform its function to its maximum capacity. In relation to this, the MML2 expressed that

*“For now the speed of our internet is not bad but I think we need to upgrade looking at the current system we are running because if we have run at full capacity we will have a lot of issues and all these comes to money. We also lack human resources in the area of ICT and networking in this hospital”*

There is an acknowledgement that some departments are still working with few computers and the absence of adequate IT personnel to take charge of the system to ensure its running at a full capacity is also missing. The statement also reveals that their internet service they have is relatively fast so until a full technology to cater for health information needs is implemented, they can’t really determine how fast it is. In a related statement MML1 established that

*“...as it stands now the internet service we have here is able to help us carry out our daily tasks but I think definitely we will need to upgrade to faster internet service to support this technology.”*

A staff of the Laboratory stated that

*“to carry such a project we need computers and other structures in place but as it stands now only few departments have this facility so will need a total upgrade to cater for this project to be fully operational which is not going to be easy for us.”*

This is a clear indication that the facilities needed to support the effective and efficient running of e-health system is not enough and there would be the need for more to be put in place to cater for such an upgrade which will also come at a cost.

However, the situation in Nyaho Medical Centre is different because the internet and ICT support services are already in place and this also accounts for the effective and efficient running of their e-health system.

*“.....in May 2015 and we needed to get a high speed internet to support it so we made it our high priority to get a good and fast internet connection so as to facilitate this project. I can confidently say that our facility has all it takes to support this project because we really planned and made provision for it.”*

(MMN3).

To them investment in such a high technology as the IHIS means there is the need for a high speed network to support it. The procurement of high speed computers and networking systems to enable easy information sharing across departments and clients on the platform shows their commitment to the project. A delay in the operation of the system will be like using a manual system of processing information which would have defeated the purpose of reducing waiting time, decongesting the waiting area and saving cost. The facility also runs a Local Area Network (LAN) where all computers in the hospital communicate to a server. MMN4 indicated that

*“.... interruption of Internet services at some user departments does not necessarily affect the use of the IHIS because we run a Local Area Network which connected to a server.”*

These clearly shows that Nyaho Medical Centre is up there in terms of ICT and its supporting services as compared to LEKMA Hospital which is yet to acquire more computers and recruit competent IT administrators to support their e-health system. The implementation of a full computerised health information system in LEKMA Hospital is likely to take some time and this can be attributed to factors such as ownership, structure of management, type of clients and the location of the health facility.

### 3.2.3 Societal Readiness

This refers to how society has embraced the computerised system of discharging health services. Health institutions do not operate in a vacuum but in a society where there is constant interaction with people. As such how people view a particular health system is very worthy of consideration.

The procurement of an e-health system in LEKMA meant that work was going to be easier and faster but there were doubts about the system because most of their clients were from poor backgrounds and they lacked understanding about the system in place. This proved to be difficult because of false claims made against the institution. In an interview it was revealed that, there had been contentions made by some individuals that the general attendance rate of patient to the facility had reduced with the introduction of the system.

MML1 has this to say

*“... there have been accusations that the system has brought some difficulties into the operations of the hospital because patients have to go back and forth for data to be gathered and processed and when they come the next time their information cannot be found in the system”.*

However, MML2 debunked such allegations and claims revealing that the hospital has rather seen an increase in attendance since last year. While such claims were not founded due to the rise in patients' attendance, he also mentioned that he cannot confirm that the patients were satisfied with services provided with the changes brought by the system.

*“... the hospital has experienced a lot of patient inflow. However, it is difficult to tell why the figures are up. If attendance had gone down, I would have believed that people are dissatisfied with the system but if the numbers are up I cannot believe that it has actually discouraged the patients neither can I say that the patients are satisfied with the system”*

A nursing staff also stated that:

*“Medical prescriptions are still done manually and this does not speak well of us and clients are also not happy but since we don't have a complete e-health system in place it will be difficult to say something about that. However, when it comes to trust I think patients still trust that information is kept confidentially even in the manual form.”*

Pertaining to collaboration with other health institutions, MML2 expressed that

*“We still partner with other health institutions for several health information needs especially when it comes to medical tests and some other referrals and this is usually done electronically.*

In a different setting, Nyaho Medical Centre has a practical experience with how society has readily accepted and tailored to suit their needs. There was a survey conducted by the health institution and this cut across clients from all levels before the system was procured. The system was developed based on the views and suggestions of clients which made the system acceptable to the clients. A human resource management staff stated that:

*“... We ensured that our system was an all-inclusive one we carried out a survey to know the preferences of our clients before we instituted the system.”*

The issue of trust comes to play in such systems and previous experiences by clients also plays a critical role situation where there is going to be change. The institution in this case was riding on the fact that clients had trust for them in the past and that implementing such a system will come with less agitations. This was evident in the implementation of the PHIS because clients had confidence in the system based on their previous relationship with Nyaho Medical Centre.

*“We have a secured and well trusted e-health information system in place which has been tried, tested and proven to be safe for confidential information. Our clients know we always stand for the best so we have their trust and you know in businesses where confidential information is entrusted to you, integrity is key in such a relationship.” (MMN3).*

When it comes to information sharing and partnering with other health institutions, MMN4 expressed that

*“We share a lot of information with third parties in a secured way and we make information shared is on a particular issue but not the whole information in our database. This is to ensure that patients’ data are protected from third parties who do not have interest in a particular information about a client. However, if you talk about ICT policies favouring the use of e-health tools I will say yes to a large extent because now access to internet is wide spread and even by a click on a phone people can interact with us on our platform.”*

The above shows that there is trust between the clients and Nyaho Medical Centre as such it’s easy for society to embrace the e-health information system in place despite the risks involved. It’s difficult for society to embrace change since change in itself is a process so getting the support of society is key to the success of every project and this a plus for Nyaho Medical Centre. However, the situation in LEKMA Hospital suggests that the level of support cannot be is low because the e-health technology because of their location and the clients they attract. This notwithstanding, the hospital has the support of society even in their current state so with the right communication they will win over the society if an effective e-health system is put in place. However, a system like that of Nyaho Medical Centre where every bit of health care delivery has been computerised creates a divide between the rich and the poor and consequently, the issue of imbalance in health care arises.

#### **4. Discussion**

From the results of the study, it is evident that both health institutions are employing e-health systems in their facilities at different levels. However, LEKMA Hospital is still lacking because the commitment from government appears to be low as compared to Nyaho Medical Centre where due to their private ownership and the desire by top hierarchy to see their health institution competing internationally has led to major investments in e-health. Tang, (2003) established that, an effective EHR system: should have the capacity of storing patient health information and data longitudinally; should enable results generated from the system to be managed proper; also enables the facilitation of electronic communication and connectivity; it should provide patient support and help in administrative processes and report. It is for this reason that the United Nations in a general assembly encouraged member countries to partner with the private sector to provide new technologies with regards to health care information. According to the World Trade Organization, (2013), though various studies have point to the fact that, there is increase in the usage of internet in developing countries, the actual application of ICT in areas like health, education, governance and trade is still a major concern. It emphasised that, this lack of application of ICT in areas that assist citizens has transformed the meaning of digital divide from access to the gap in ICT capabilities between developed and developing countries.

The study also revealed that core/technological, structural, and societal issues determined e-health readiness in the health facilities. E-health is crippled by a lot of challenges especially from institutional to governmental policies. Qureshi et al., (2012) identified that, execution of e-health in developing countries is very challenging especially in their rural areas due to reasons such as, poor infrastructure, lack and unevenly distributed government subsidies and services, lack of qualified personnel to implement and run the services and political influences. This means that the overdependence on government to subsidise health service activities and also excessive political control has

damaging effect on every health sector activity which e-health is no exception. However, Oak (2007) established that, these challenges could be avoided by examining and lessening the social, political, organizational, infrastructure and technological factors that influence technological innovations implementation.

## 5. Conclusion

This study provided a reflection on the nature of e-health readiness within the Ghanaian health sector using one public (LEKMA hospital) and one private (Nyaho Medical Center) health facility within the Greater Accra region. Assessing e-readiness is a better way of identifying the potential causes of failure to technological innovations before implementation. From the literature, it is evident that implementation of technological innovation starts with the readiness assessment; which prepares the organizations to join the networked community. Therefore, organisations that need to join this networked community should identify key components for e-health readiness assessment and develop or identify a framework that fits their needs. Thereafter, these organizations should develop a systematic process for e-health readiness assessment from which a reliable tool could be developed to facilitate the assessment process. The key findings indicate that the private sector health facilities within the Ghanaian context seem to be performing better than those in the private sector. On the basis of this, this study suggests that public health facilities must learn from the private sector in order that they can scale up their implementation of e-health systems.

## Reference

- Adjorlolo, S., & Ellingsen, G. (2013). Readiness Assessment for Implementation of Electronic Patient Record in Ghana: A Case of University of Ghana Hospital. *Journal of Health Informatics in Developing Countries*, 7(2).
- Almunawar, M., & Anshari, M. (2012). Health Information Systems (HIS): Concept and Technology. *Mohd. Nabil Almunawar*.
- Blaya, J. A., Fraser, H. S., & Holt, B. (2010). E-health technologies show promise in developing countries. *Health Affairs*, 29(2), 244–251.
- Campbell, J. D., Harris, K. D., & Hodge, R. (2001). Introducing telemedicine technology to rural physicians and settings. *J Fam Pract*, 50, 419–424.
- Crouch, M., & McKenzie, H. (2006). “The logic of small samples in interview-based qualitative research.” *Social Science Information*, 45(4), 483–499.
- Currie, W., & Finnegan, D. J. (2009). *Integrating healthcare. Integrating healthcare with information and communications technology*. 3–34.
- Green, J., & Thorogood, N. (2009). *Qualitative Methods for Health Research*.
- Jennett, P. A., Gagnon, M. P., & Brandstadt, H. K. (2005). Preparing for success: readiness models for rural telehealth. *Journal of Postgraduate Medicine*, 51(4), 279–285.
- Jennett, P., Jackson, A., Ho, K., Healy, T., Kazanjian, A., & Woollard, R. (2005). “The essence of telehealth readiness in rural communities: An organizational perspective,.” *Telemed J E Health*, 11, 137–145.

- Khoja, S., Scott, R. E., Casebeer, A. L., Mohsin, M., & Ishaq, A. F. (2007). e-Health Readiness Assessment Tools for Healthcare. *Telemedicine and E-Health*, 13(4).
- Lærum, H., Karlsen, T. H., & Faxvaag, A. (2003). Effects of scanning and eliminating paper-based medical records on hospital physicians' clinical work practice. *Journal of the American Medical Informatics Association*, 10(6), 588–595.
- Langabeer, J., & Champagne, T. (2013). The Evolution of Health Information Exchange: Health Information Exchanges Have Existed for Two Decades but Only Recently Have Seen Widespread Growth and Utility. *Journal of Health Information Management*, 27(2).
- Li, J. H., & Seale. (2012). An E-Health Readiness Assessment Framework for Public Health Services – Pandemic Perspective. Proceedings of the 2012, 45 Hawaii International Conference on System Sciences, Hawaii. *IEEE*, 28002809.
- Li, J., Land, L. P. W., Chattopadhyay, S., & RAY, P. (2008). *E-health readiness framework from electronic health records perspective*.
- Miller, R. H., West, C., Brown, T. M., Sim, I., & Ganchoff, C. (2005). The value of electronic health records in solo or small group practices. *Health Affairs*, 24(5), 1127–1137.
- Mugo, M. D., & Nzuki, D. D. (2014). Determinants of Electronic Health in Developing Countries. *International Journal of Arts and Commerce*, 3(3).
- Oak, M. . (2007). “A review on barriers to implementing health informatics in developing countries [Electronic Version].” *Journal of Health Informatics in Developing Countries*, 1(1), 19–22.
- Qureshi, Q. A., Ahmad, I., & Nawaz, A. (2012). “Readiness for E health in the developing countries like Pakistan,.” *Gomal Journal of Medical Sciences*, 10(1), 160–163.
- Tang, P. C. (2003). *Key capabilities of an electronic health record system*.  
[www.nap.edu/openbook/NI000427/html/index.html](http://www.nap.edu/openbook/NI000427/html/index.html).
- Wickramasinghe, N. (2000). IS/IT as a tool to achieve goal alignment. *Int Journal of Technology Manag*, 2(1), 163–180.
- Wickramasinghe, N., & Misra, S. (2004). A wireless trust model for healthcare. *Intl Journal Electronic Healthc*, 1(1), 60–77.
- World Trade Organization, – (WTO). (2013). *Electronic commerce, development and small, medium-sized enterprises*. [https://www.wto.org/english/tratop\\_e/devel\\_e/wkshop\\_e/we193doc](https://www.wto.org/english/tratop_e/devel_e/wkshop_e/we193doc)