



Health personnel's willingness to implement digital methods of patient data handling.

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<p>Abstract:</p> <p>This qualitative study aims to understand personnel's views of and willingness to change method of handling patients' health-care information from a manual to a digital method in a general district hospital. Information technology systems like electronic health records and medical health records have been used recently by healthcare organizations to provide quality healthcare and to enhance professional performance. The research questions were geared towards the challenges faced in retrieving health information and the management process that enables healthcare professionals to achieve proper handling of patient's healthcare information. This study was conducted using semi-structured interviews with six general practitioners (GP) and six nurses from different healthcare facilities in the same region. The theoretical framework of this study was based on the technology acceptance model, information system success model, organizational empowerment, and research on the implementation of modern technology. The results show that organizational commitment to facilitating conditions and information quality are the key factors that organizations must consider before implementation. Incorporating comprehensive training to develop professional skills and competence in using information technology such as electronic health records is essential. The results also indicate that stakeholder involvement in some stages of implementation might play a vital role, as managers must communicate the urgency of the change in their healthcare facilities.</p>	
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1 INTRODUCTION

1.1 Motivation for the choice of research topic

Changes are bound to happen when healthcare situations have not been handled in appropriate ways, resulting in the loss of the lives of many citizens due to the mismanagement of patient health data information. While some developed countries are more advanced in handling patient health information, some developing countries need help adapting to innovative technology. In fact, some countries still need to incorporate recent technology especially in vital sectors such as hospitals. I will be writing about a situation that has been unfolding in my chosen country Cameroon, reason been that the government health facilities are still in us of manual methods of handling patients' health information.

In a system where patients' healthcare information is not computerized but saved manually in a consultation or hospital book, medical personnel find it challenging to administer proper healthcare services. Consequently, inadequate follow-up on patient health issues has led to the loss of many patients lives because their health history is challenging to retrieve. Many patients receive incomplete medical services in some hospitals. This is a problem for Cameroonian society, which calls for a change in the handling of patient healthcare data by introducing digital services with a proper database system.

The relevance of this study is to change how patients' health information can be managed, using digital methods to quickly retrieve data at anytime and anywhere regardless of the circumstances. Whenever information is saved digitally, it becomes effortless to assess and can be used at any time when needed. The most recent case is the pandemic crisis, in which more people died due to the pandemic than the official number of deaths reported. During this time, more than 50% of Cameroon's sicknesses were said to be related to Covid-19, which was not the case. Hospitals could handle this differently if major hospitals had a proper patient health information database.

1.2 Research background:

This study's background is related to the handling of patients' data in Cameroon's general district hospital. Cameroon is a Central African country situated in the Gulf of Guinea. Yaoundé is the capital city and has biggest population, whereas Littoral-Douala is the economic capital of Cameroon with the largest seaport and airport. Cameroon's ten regions' have a total population of 26 million peoples and it is a bilingual country. The main region selected for this case study is the southern region of Cameroon. The reason is that this area is the English-speaking part in Cameroon, and it is ranked as the third most populated.

Cameroon is bilingual, with two national languages, French and English. For this reason, this study will concentrate on the English regions in Cameroon to collect relevant data within the research period without facing a barrier in communication. This case study aims to understand health personnel's views of and willingness to change patient data handling from a manual method (using consultation books) to a digital service. Therefore, this study will focus on patients' health data together with hospital staff, to determine the appropriate changes to enhance the medical services provided to patients.

This study will center on words such as date, "healthcare information database, data management system and technology acceptance. The word data originates from the Latin word "datum" and can be defined as facts and statistics used for reference or analysis (Soanes & Hawker, 2005) especially when examined to learn things or to make decisions (Hornby et al., 2015)" Database" refers to an organized set of data stored in a computer. It can be retrieved and used in diverse ways and can take the form of structured data in a computer. At the same time, a database management system is defined as organizing and managing a large amount of data (Hornby et al., 2015). When discussing the quality of medical care provided by staff to patients, certain variables are needed for proper medical care, especially patient health information, which is necessary at all levels of treatment. Therefore, the information in a database remains a critical factor in patient care and would be used continuously in the service. Moreover, the quality of healthcare might improve sustainably, if patients' health information were available for proper follow-up, as the cost of healthcare would reduce, job structure would also become more comfortable for health care employees, especially doctors, healthcare assistant and nurses.

The thesis aim is to understand health personnel's views of and willingness to change in handling patients' data from a manual method (use of consultation books) to a digital database. And the research questions are:

What influences healthcare professionals' willingness to change from manual to digital methods of saving patients' health information?

What management tools would enable (HCPs) to properly handle patients' healthcare information (that is using a database management system) to improve patients—care and well-being.

1.3 Delimitation

The scope of this qualitative study was to understand health personnel's views of and willingness to change in handling patients' data from a manual method to digital database. However certain levels of managerial personnel and organizational factors regarding organizational change management were not discussed.

1.4 The relevance of this study to business practice

The findings of this study may be worthwhile in showing business on how to implement electronic health records (EHR) while providing a structure for implementing and sustaining the use of EHR in a health organization, as many previous studies have elaborated on the benefits of using EHR systems to provide quality care to patients and access to patients' complete health information. Technology and innovations continue to improve the quality of healthcare for patients and increase the performance of health professionals. Therefore, to achieve the benefits of EHR modern organizational managers and stakeholders must be prepared for a change and to communicate innovative ideas. They must create a sense of urgency around the objectives, together with a guiding coalition to plan and implement the change in the organization (Appelbaum et al., 2012). These approaches will help to foster the transformation of the organization.

Successful implementation of an EHR system in the studied healthcare facility would be of benefit to businesses. An EHR software and information technology specialist will be available to provide and maintain this system once it is in use. The company will also provide computers and other equipment relevant to the implementation. The implementation process is quite complicated and costly. Moreover, it is advisable to welcome stakeholders who are conversant with modern technology and are willing to change the structure and system of handling patients' health information and culture in the organization.

1.5 The relevance of this study to social change

As many are using smart-phones nowadays, health-related apps have started evolving, such as the Waspito which connects users with African doctors, laboratories, and pharmacies on the platform after paying a fee of 6000cfa. This has a positive impact on society, as patients can reach multiple doctors at any time when needed. Therefore, the implementation of EHR systems will contribute positively to social change as patients will no longer have to visit hospitals with multiple consultation books and missing data. Consultation will be swift as patients' data will be available, enabling easy treatment and reducing the cost of redoing treatments as has been previously done in some cases. Hence, patients will receive better healthcare services in their regions or local communities.

In addition, in time patients' health information will become accessible to them when they seek treatment in different regions or provinces as (Craig Janhavi & Beasley, 2012) mentioned, this is becoming a concern, as patients will soon want to always have access to their medical data.

2 THEORETICAL FRAMEWORK

In this chapter, the relevant literature review was done using internet databases ScienceDirect and Sage, Emerald insight Journals, Research gate and Google scholar. The theories of the technology acceptance model and information system success model are reviewed.

2.1 Change management in healthcare

Organizational change happens for distinct reasons, and most changes that occur are usually meant for future growth or to achieve success by increasing efficiency in an organization. In this study, the significant reason for a change in structure was to reduce the mortality rate by introducing an appropriate healthcare database system. Significantly, organizational change usually starts with people (employees and leaders). To proceed, (Portal, 2012) define change management as the “people side of change” through the application of a structured process and a set of tools for leading people to achieve a desired outcome. A change is usually made in an organization to help employees transit to change by enabling them to engage, adapt and be ready to use the change (Prosci.com). This is why companies have different approaches and processes to implement change because of the different tools that are needed to implement change.

In this study of change management, a review of Kurt Lewin’s change theory and Kanter’s (1993) theory of structural empowerment is most relevant to change management. Lewin’s theory simplifies the process of change in an organization. It is easy to implement in three stages, and when correctly used, it helps to encourage long-lasting change in an organization. Moreover, this theory is applicable because this study is in its preliminary stage, so the unfreeze stage of Lewin’s theory is relevant. In contrast, Kanter’s theory of structural empowerment describes how an organization could empower its employees to adapt to recent changes through different processes in the organization.

In a review of adopting change in an organization (Stichler, 2011) examined leading change as one of the most difficult tasks leaders do face in the organization. The researchers further explain that using change theories can help leaders to develop a good structure on how to lead change. In their study, Lewin, a social scientist and physicist, framework was used to emphasize that proper change needs to be well planned and communicated to all levels of an organization. He describes the organizational change process in three stages, unfreeze, change(transition), and freeze(refreezing). When used, this theory gives corporate leaders the direction to demonstrate the need for a change to employees and reasons not to maintain the old practice, that was found to be more dangerous and costly to clients, employees, and the organization. Each stage has different elements of change, beginning with unfreezing. At this stage, managers or leaders have

a significant role to play. The most critical stage according to (Stichler, 2011) explains that managers need to produce a solid plan to motivate the change. In an article on , adapting to change as well as in a review of Kotter's change model (Appelbaum et al., 2012) the initial step of this model is described as creating a "sense of urgency" the objective of the upcoming change needs to be communicated to employees and their readiness for the change must be assessed (Watts, 2023) together with the other seven steps, his framework guides leaders through an approach to producing lasting change for an organization (Kotter, 1996). In using Lewin unfreezing stage, all medical staff involved must be motivated and feel engaged in the change by communicating the innovative ideas and creating a sense of urgency, based on the

objectives of making patients care and data handling much easier to handle. Further, a review by (Bennis et al., 1969) and Lewin described the change stage as the actual stage, where employees develop a new perspective towards the change, gradually knowing that their work environment will change. Both explain that at this stage, the organization, through their leaders develops employees' skills and competencies through training while setting up a new work structure to begin testing before the actual enforcement can occur (Stichler, 2011). Another review explains that this stage concerns the people in the organization, their behavior, thoughts, and feelings towards the organization (Theodore, 2013). Here the approach becomes more iterative with the employees to achieve the transition.

Further, a review by (Bennis et al.,1969) and Lewin described the change stage as the actual stage, in which employees develop a new perspective on the change, gradually understanding that their work environment will change. Both explain that at this stage, the organization develops employees' skills and competencies through training given by their leaders, while setting up a new work structure to begin testing before the actual enforcement can occur (Stichler 2011). Another review explains that this stage concerns the people in the organization and their behaviour, thoughts, and feelings towards the organization (Theodore, 2013) here, the approach becomes more iterative, involving the employees in achieving the transition.

Refreezing occurs when employees have fully adopted the new change, and their behavioural norms act as a factor to influence the change. This is the phase of acceptance by professionals after the transition stage, the leader's role is incredibly significant as they need to recognize the employees (early adopters) who have fully or partially accepted the change.

2.2 Implementation of change

A review from a journal of hospital infections emphasized that organizations should focus on measuring performance and accountability to manage infections properly. In this research, patients' data was seen to be relevant to helping target and prevent diseases if used effectively to drive changes. More precisely, hospital experience shows that every aspect of change can be improved only if there is an exemplary implementation of change to identify the critical impact of the change as a priority to the organization (Edwards, 2016). Furthermore, though data was the central aspect under consideration to prevent and manage infections, other aspects such as collective leadership, good management, expertise and culture change remain vital during the implementation of change.

To support the implementation of change, people, processes, technology, and structure are seen as the secondary focus when the change of people's behaviour has been put in place as the primary focus. Lewin's planned approach, or stage two, which he called "change," has been used in the health care environment as a powerful framework that has provided ideas about change to leaders, helping them understand the behaviour of individuals, teams, and organizations (Beasley et al., 2020). According to (Antwi & kale, 2015) to achieve efficient care within facilities review emphasized a person-centered framework that highlights the relevance of team-driven initiatives and leaders who concentrate on creating an environment open for individual health care professionals to experiment with new ways of working.

A review on best practices to improve public health by Health in All Policies (HiAP) emphasizes collaboration among health practitioners to adapt to working with other sectors to achieve equity-focused change. In this article by, Rudolph et al, five key elements were identified that best suit the (HiAP) approach, (1) promoting health, equity, and sustainability, (2) supporting inter-sectoral collaboration, (3) benefiting multiple partners (4) engaging stakeholders and (5) creating structural or procedural change (Rudolph & Caplan, 2013). Moreover, compelling evidence shows that these key elements have positive effects on health systems, policies, and programs. As a result, HiAP implementation did not happen through a single public health action. Still, there was a need to integrate change in daily roles and policies within each health sector. This practice was geared towards operationalization to inform researchers and

practitioners who intend to implement healthcare rules, which should begin with government officials and community leaders. In continuation, the review highlights vital aspects of communication strategy when engaging partners in the healthcare context when planning and implementing change in healthcare (Cain et al., 2022).

According to a review of a health system in transition" in Finland, the municipality organized the core health system. Some cities arrange their health system for their citizens alone or with other joint municipalities to assess population needs, properly monitor service volume and quality, and ensure equal distribution of health services, acting as a public authority in decision making and more precisely in social care (Keskimäki et al., 2019). This review affirms what the HiAP reviews emphasized, that, government officials and community leaders play a key role in bringing change in the health sector.

Another review of dental health care on lessons learned from the first steps in implementing value- based oral healthcare (VBOHC) was carried out by the Medical University of Vienna, with the proposed aim of determining the lessons learned and describing the next steps forward to VBOHC implementation. Change can be implemented in an organization in steps to determine which process will achieve the objectives. The sample group for this study was patients aged 16, whose medical history was integrated in the oral health impact profile 5 (OHIP5) (Omara et al., 2022). A patient's account of their medical history called anamnesis, is a form of registration done on paper that every patient is compelled to fill during registration, which is later uploaded into the patient's record using a scanning machine by the central administrator officer. Afterwards, it is the responsibility of the treating dentists to transfer and save the data digitally. This process of handling data between digital and paper was investigated to understand which implementation process would serve as a lesson learned in implementing VBOHC.

The results of this report show that 8,147 patients were asked to fill in the oral health impact profile. However, only 266 patients OHIP-5 files were successfully scanned and transferred into the digital system by the dentist. In understanding the effectiveness of transferring data from physical to digital form, patient's data was selected and compared, with the finding that 83.1 % of patient's data was similar. The lesson learned was that implementation begins with the healthcare facility itself and its willingness to implement recent changes, stakeholders' commitment to dental patient-reported outcome measures, applying measures to integrate and

prioritize follow-up visits, the importance of digital solutions in oral healthcare, and a continuous monitoring and evaluation process. In conclusion, dental patients reported outcomes in a clinical setting are successful and are the first essential step to achieving value-based oral healthcare implementation.

2.3 Patients Safety

Researcher (Tripathi et al., 2009) emphasized that health information exchange begins with patients. This concept of patient safety developed by (Tripathi et al.,2009) expresses that health information exchange plays a vital role in healthcare service. They further explain that the future of healthcare depends on how hospitals are willing to engage patients and earn their trust in managing their information.

The idea of patient's safety according to (Nie et al., 2013) must begin and develop as a culture to provide quality healthcare to patients. The hospital must be determined as an organization to offer and adapt to the culture of providing quality healthcare to patients.

According to (Brammer et al., 2012), service innovation directly affects patient service quality. They explain that to improve the standard of healthcare, there is a need for an elevated level of collaboration among practitioners who have the mindset of accepting changes, including different improvement methods such as the redesign of work, performances change management and strategies for accountability care. Those involved in managing patients must ensure that patients feel involved during the provision of care, which depends on the help of health information technology experts to collect patients' information. This article mentioned four relevant areas that need to be considered for a good change to take place, of which one is most related to this study. That is, it has gradually become a concern that patients will expect their data to be accessible to them whenever needed. Recently, it was noticed that health data is becoming more critical to providing healthcare in the 21st century. Moreover, the exchange of information across health systems will support a new level of data management among practitioners, patients, and caregivers.

2.4 Technology adoption

A review by (Ladan et al., 2019) Q methodology studied eHealth adoption and use among healthcare professional's (HCPs) in a tertiary hospital in Sub-Saharan to explore the viewpoints of (HCP, s) on the adoption and use of eHealth. The study discussed the importance of information and communication technology (ICT). When merging recent technology with eHealth, HCPs can provide quality healthcare to their patients and improve their clinical practices.

Today, information and communication technologies have been used to enhance the many challenges that many healthcare systems face, such as improving information management, access to health services, and quality, and safety of care. A review from (Gagnon et al., 2010) emphasized that with the increase in computerization in every unit of activity, ICTs are expected to become a critical tool of HCPs practice. (Buntin et al., 2011) Argued that some HCPs will still want to do things traditionally and will not welcome change despite recent healthcare technologies can improve patients' health, likewise, increasing the performance of the HCPs. Both researchers stated that incorporating technology in every sector of activity will significantly improve the quality of health services, save costs, and engage patients in their care. eHealth is defined as promoting, empowering, and facilitating the health and wellbeing of humans and communities, together with professional practice that uses information from patients, information management and ICTs (Royal college of Nursing, 2017). In this study, eHealth resources will be on computer devices with internet and (EHR).

Despite the innovation in digitalization, many healthcare services still do not want to adopt ICT, thus slowing and risking the quality of healthcare provided. Likewise, regarding patients' confidence in their services, Gagnon (2014) emphasized that HCPs are the most relevant ones to cite their difficulties and express a need for an ICT in service.

The research report further touched on attempts by different researchers to point out the different facilitators and barriers to eHealth use in healthcare. In their study, Gagnon et al 2012) examined certain factors facilitating adoption that may vary according to HCPs specific perceptions about the characteristics of eHealth resources. Further, these barriers to adoption are not limited to these characteristics but could involve individual, professional, and organizational factors.

One of the main topics touched in this study was the challenge of the adoption of technology within healthcare in Sub-Saharan Africa, (Akanbi et al., 2012) reports that though there is improved access to the internet, increased use of personal computers and collaborations between health institutions, there has not been an increase in the use of ICT in clinical practice. Also, poor existing infrastructure, network failure and feelings of distress surrounding the use of EHR among healthcare workers have been seen as human factors. (Akanbi et al.,2012) concluded that government healthcare institutions are quite slow in adopting eHealth to improve the quality of healthcare.

Another researcher, (Ami-Narh & Williams, 2012) pointed out that for a successful eHealth adoption to occur, stakeholders should be involved and considered in every step of adoption. Likewise, (Zayyad & Toycan, 2018) described how the level of eHealth adoption in Nigeria could have been better due to poor infrastructure and lack of policies on eHealth in the country.

In the Q methodology study, data collection was conducted using exploratory design, with a total sample of 18 nurses and 18 physicians, from host tertiary institutions in Nigeria and Sub – Saharan Africa. Using Q methodology, participants were purposively sampled concerning their adoption experience using eHealth in clinical practice. The data was analyzed using person factor analysis and complemented with audio-taped interviews. The analysis yielded four factors influencing healthcare workers adoption and use of eHealth within their clinical practices in SSA.

The first factor concerned patient-focused eHealth advocates, the participants concluded that eHealth improves their work and ability to provide quality healthcare. Their points of consideration when using technologies were about their patients and families. Furthermore, the HCPs promise to be loyal if technology is provided across departments. Despite the difficulties faced when using this technology, especially when performing tasks, it still plays a significant role in helping them to accomplish tasks quickly. HCPs are more worried about accessing such technologies, which affects their confidence when using them within their clinical practice. They proposed that technology compatibility with other technology platforms might play a vital role in adopting such technologies to enable HCPs to carry out their duties daily.

Second, according to task-focused eHealth advocates, HCP still needed to put lot of mental health efforts into getting used to it, despite their ICT experience. This technology helps them to

perform tasks without facing any barriers to their daily routine and with a consideration for patients and families' views, which was a major reason for using eHealth resources.

Technology's contribution to their tasks and activities serves as the primary motivator for its use. Also, HCPs express the difficulties that hospitals face due to a lack of regular training to enhance their use of eHealth resources by management.

Third, traditionalistic pragmatists identify clinical ICT resources as voluntary. Thus, while acknowledging the importance of eHealth resources in accomplishing their clinical tasks and providing quality healthcare, they still find them challenging to use. Moreover, they prefer to perform tasks without eHealth resources. Besides, it is challenging to remember how to use them, and HCPs believe that using eHealth resource does not make them unique, either in comparisons to their colleagues or gaining recognition for their performance efforts in using these resources.

Lastly, tech-focused eHealth supporters acknowledge the importance of eHealth within their clinical practices. They recognize the significant role of eHealth in their clinical practice and wish to have a chance to use it more. However, they have overcome their difficulties in using eHealth resources and their compatibility issues.

Even though all participants do rely strongly on eHealth for clinical decisions, because of the infrequent updates to eHealth resources, this has become exceedingly difficult. As a result, adoption is hindered, particularly in hospitals where it has not been adopted. Lack of technical and management support from management colleagues makes the whole adoption difficult.

2.4.1 Technology Acceptance among physicians

To understand the adaptation and acceptance of technology among physicians and nurses, a Technology Acceptance Model (TAM) was used to understand technology in healthcare. The relevance of information technology in organizations has pushed many researchers to conduct research on user acceptance as a critical issue in technology implementation and management issues in healthcare sectors. The research was done by (Hu et al., 1999) in public tertiary hospitals in Hong Kong to examine the relevance of technology acceptance to physician's decisions to incorporate telemedicine technology in a healthcare context. Paul J mentioned that the user group a of technology and the organizational context are new to information technology

(IT) acceptance adoption research. In using this model, their explanation was based on each variable of the model to explain the individual links of acceptance of telemedicine technology among physicians practicing at public tertiary hospitals in Hong Kong.

Their result suggested that TAM provided a reasonable understanding of physician's intentions to use telemedicine technology. In summary, the result of using a TAM model, was that perceived usefulness was found to be a significant determinant of attitude and intention, whereas perceived ease of use was not. Thus, they saw some gaps in the model determinants. They believed the mode had a limitation, which required the incorporation of additional factors using other IT acceptance models to improve its explanatory usefulness in a healthcare context.

A prominent researcher further investigated both the theory of planned behaviour (TPB) and (TAM). In his study, he outlined that, after comparing the TAM and TPB which uses behavioural, normative and control beliefs in addition to attitudes, subjective norms, and perceived control to predict behavioral intentions. TPB is seen to be more generalizable than TAM which makes TAM effective when planning to test a technology in a new setting (Venkatesh et al., 2003). The TAM, which was derived from the theory of reasoned action (TRA), is seen as a general model of behaviour based on beliefs that influence attitudes, which determine intentions, which in turn command behavior (Ajzen & Fisbein, 1980). The TAM implies or insinuates that an intention to accept technology is determined directly by attitude perceived usefulness and perceived ease of use. Perceived usefulness is seen as the individual beliefs that influence behavioural intentions when using a specific system that would contribute to the user's job performance. The determinants of the model measure individuals' views of and responses to adopting a modern technology, and the behavioural intention component of the TAM considers an individual's intention to utilize a recent technology (Davis, 1989). The TAM model has been tested in the last decade in 45 empirical studies (King & He, 2006) from different contexts. The empirical tests of the TAM have shown and proven the model to be significant for individuals of all levels of IT competency. Moreover, the TAM predicts user technology usage in mandatory and voluntary technology usage (Venkatesh & Davis, 2000) Concerning technology acceptance among physicians in connection with TAM, this study confirms the relevancy of attitudinal constructs to the model. The TAM predicts variance in technology acceptance for different health professionals.

Thus, other researchers have found that the attitudinal construct could attain a more generous view of the model (Simon & Paper, 2009). However, studies show that attitude influences behavioural intention (Yang & Yoo, 2004), notably, this research on technology acceptance among physicians and many empirical tests have confirmed the relevancy of attitudinal constructs to the model. However, the direct connection between perceived ease of use and behavioural intention in this study has yet to be proven across various contexts (Hu & Chau, 1999). In contrast, many reviews and empirical tests of the TAM show a direct relationship between perceived usefulness and behavioural intention. Thus, the TAM model's goodness has come to consider external variables influence and barriers to technology acceptance. The significance of the TAM comes from its force measuring its variability in technology acceptance in its sample population, and thus demonstrating the model's accuracy.

2.4.2 Barriers to technology acceptances among physicians using the TAM Model

A review by (Yarbrough & Smith, 2007) on technology acceptance among physicians was reviewed to understand the barriers to physicians' adoption of information systems using the TAM. This study discussed empirical studies of the TAM and its conceptual development over the years. The study was more about patients' dissatisfaction with how physicians' reactions to them during caregiving. Patients complain about having less time with the physicians and not having electronic access to medical records, consequently, they cannot easily book or schedule appointments with physicians. For accessible communication, some hospitals request e-mail communication via intranet from physicians to gradually end the practice of handwriting by physicians (Bodenheimer & Grumbach, 2003) Through such recommendations, the healthcare community in the United States needs help to achieve this goal. A survey shows that only 25% of USA physicians used electronic medical records system (EMRs) in 2004 according to the institute of medical. Also, only 20% of USA hospitals had computerized physician order entry (CPOE) systems by (Ash et al., 2003). The results of the survey showed that a CPOE system was not available in 83.7% of hospitals, whereas 9.6% had available (CPOEs) and 6.5% had partially CPOE. Overall physicians' resistance was the most significant barrier to implementation.

Hence, looking at electronic communication, only 6% of e-mail users used e-mails to communicate with personal physicians as of 2003 (Bodenheimer & Grumbach, 2003). Physicians' hesitation to communicate with patients resulted from the lack of reimbursement for providing such a service to patients, which implies that salaried physicians are more likely to use information technology. This result shows that if physicians receive compensation, this might influence technology adoption. Another key hindrance to physician technology practice is the need for more documentation showing that technologies can and do increase the quality of healthcare. Other factors such as privacy and confidentiality, the lack of proper infrastructure and regulations regarding such issues, were also considered barriers to physicians' technology utilization (Kassirer, 2000).

The different training and studies that physicians undergo may cause differences in users' technology acceptance. In this study, the researchers obtained vital information from 18 empirical studies covering six distinct types of technology, which gave them a proper understanding of the factors hindering physicians' technology acceptance. They were as follows

- (1) Interference with traditional practices patterns
- (2) No significant proof of benefits regarding IT.
- (3) Organizational and system issues.

All have contributed to forming a barrier to technological acceptance among physicians in the existent literature. Most doctors are reluctant to adopt technologies that they see as interrupting their regular practice patterns during implementation. The time needed for adoption is seen as the primary barrier to physicians' acceptance of modern technologies in comparison to papers or consultation books (Overhage et al., 2001). In the study conducted by Overhage and others, to understand the use of (CPOEs) among physicians in the Midwestern United States, 11 primary care clinics with 34 physicians in two groups were sampled. One group had already implemented CPOE, and the other had experience using CPOE. This study revealed that CPOE allows physicians to spend more time with patients. A study of 55 British physicians also revealed that time and costs are seen as barriers to physicians' acceptance of technology. In a qualitative study by (Karsh et al., 2006) sampled a focus group over nine months with eight physicians and six clinical assistants, they noticed that barriers to technology acceptance included time and necessary practice patterns. However, (Horsley & Forster, 2005) added that the time needed for physicians to implement CPOE could be resolved by reducing duplicate efforts through investing

in using a CPOE system, as the barrier to physicians' acceptance of technology is seen in the implementation stage. Another barrier to technology use is the need for more support to prove that information technology reduces medical errors (Kohn et al., 2000). However, the researcher said physicians face pressure to adopt information technologies such as CPOE, error reporting systems and EMRs. Another critical researcher (Berger & Kichak, 2003) explains that these systems all have the potential to reduce medical errors and health costs. However, the lack of evidence to support this claim that IT decreases medical errors has given physicians little motivation to accept modern technology.

Another study was done by (Ash et al.,2003) using an inductive approach to identify themes that they believe are some of the causes of physician resistance to technology acceptance. Clinical and IT personnel from three hospitals were sampled to collect information on the barriers to the successful implementation of CPOE. Categories identified were as follows

- (1) Organization specific issues
- (2) Clinical and professional issues
- (3) Implementation issues
- (4) Technical issues.

However, the study lacks an approach to identify where CPOE was successfully implemented. Regardless, it is relevant to the present study. Subsequent research indicates similar themes regarding the barriers to technology acceptance which are organizational, personal, professional and system specific issues. General organizational issues have been identified by four recent studies of physician's technology acceptance. In contrast to other studies (Dansky et al., 1999) EMR implementation was studied among 67 physicians and 18 mid-level clinicians in ambulatory care centers from different information systems and job design reviews. Perceived usefulness determinants that were observed or evaluated were as follows,

- (1) Individual characteristics like age, computer experience and patient care values.
- (2) Computer anxiety.
- (3) Contextual factors such as office conditions and organizational support.

Their results showed that demographic factors do not influence the perceived usefulness of technology. It was observed that computer experience and perceived organizational support were seen as positive predictors of perceived usefulness. Organizational support is related not only to organizational culture, but also to the availability of appropriate and standard training and

infrastructure needed for the proper implementation of EMR (Dansky et al., 1999) based on analysis and descriptive statistics. Another study (Audet et al., 2005) discussed a random sample of physicians and found similar patterns of technology acceptance for medical technologies. This study also indicated that organizational characteristics are seen to influence technology acceptance. Furthermore, the study emphasized that the rate of practice is considered a vital predictor of technology acceptance. In continuation, the research identified salaried physicians as a critical variable for technology acceptance. Salaried physicians are more motivated to use and accept recent technologies. However, salary was not the only variable the researcher discussed, cost, lack of standards and lack of time were seen as three significant barriers to IT adoption. A qualitative study by (Karsh et al., 2006) linked physicians' time cost to organizational issues with confidentiality and policies regarding error reporting as barriers to technology acceptance and incorporation. Also, technology-specific training should be considered as it has been seen that training can influence physicians' technology acceptance.

2.4.3 Nurse Acceptance of Electronic Health Record Technology (EHR)

A literature review was conducted by (Strudwick & McGillis Hall, 2015) on nurses' acceptance of electronic health record (EHR) technology in a large group of HCPs, primarily nurses, using specific models such as the technology acceptance model (TCM) and the, DeLone and Mclean model for information system success. EHR is adopted to improve healthcare quality, reduce costs, and increase healthcare access to the vulnerable population. However, many researchers who have concentrated on EHRs (Electronic Health Record) (Electronic Health Record) adoption have emphasized the financial cost of implementation, procurement, and privacy without consideration for the HCPs intended to use the EHRs in their job practice (Khangura et al., 2010). The acceptance and process of using technology on the part of professionals also depends on the organization's ability to install EHRs. Khangura et al. (2010) argued that to understand HCPs acceptance to technology they must be given the choice to use EHR.

Where EHRs are fully installed, professionals are forced to use the system because it has been set for use, whereas when EHRs have not yet been installed, professionals must first accept the new recent technology. However, if HCPs do not consent to the comprehensive use of EHRs the

motive of installing EHRs cannot be realized in patient healthcare, likewise, the benefits of cost and quality care.

The TAM was used in this study to understand the acceptance or view of technology such as the EHRs by those who will use it, as well as the DeLone and McLean model for information systems technology. Both models, developed in the 1980s and 1990s, are still relevant in explaining nurses' acceptance of health ICTs. A review done by (Godin et al., 2008) of 39 studies using the DeLone and Mclean model regarding ICTs in the nurse population found that these models are relevant when wishing to understand the elements that relate nurses to modern technology. At the same time, the TAM has been used as a social cognitive theory to understand HCPs intention to use healthcare ICTs. The TAM is a theoretical model used in healthcare to understand HCP as end users of healthcare technologies. The TAM is based on the theory of reasoned action (TRA) with behavioural intention as the critical variable, which is related to an individual's attitudes and subjective norms. Behavioural intention is related to real behaviour. According to Davis, in the TAM behavioural intention is related to person's attitude, with other variables such as perceived usefulness and ease of use as explained previously in this report. In the existing literature, six studies were reviewed to understand nurses' acceptance of EHRs. Perceived usefulness was one of the most vital variables related to technology acceptance in TAM model. Perceived usefulness in this study can be defined as how appropriate and valuable the EHR is and will be to nurses in their clinical roles. Nurses are influenced to accept and use EHR technology in their clinical or daily work if the technology provided will improve or enhance patient care. However, if nurses must make efforts to use the technology provided, the level of acceptance will be low. In addition, another study found no relationship between perceived usefulness and EHR acceptance by nurses. Their result was related to the competencies and skills that nurses in this sample needed to use EHR in their daily work life (Ketikidis et al., 2012). This group of nurses would find it exceedingly difficult to adopt EHR technology, implying that the nurses saw EHR technology as more challenging to use than the benefits it brings. On the other hand, perceived ease of use, as one of the variables of TAM, has also been tested in many studies by (Palm et al.,2006) and many other researchers. Perceived ease of use was defined as how effortless EHR technology was to use in daily work life, considering how often staff would have to use this system. The results show that there is a meaningful relationship with EHR acceptance with nurses. The results show that the practicality

of EHRs is a vital part of their successful adoption by nurses. Regarding the fact that healthcare facilities are often busy and demanding, any form of technology that is difficult to use may not be adopted by nurses.

In another study a researcher examined whether personality traits have any direct relationship with EHR acceptance (Kuo et al., 2013). Their results show that nurses with confidence in their perceptions of both TAM variables see EHR as a useful and easy to use technology necessary for their work. When a nurse is confident in using the technology, they are more likely to accept its adoption. Moreover, nurses more advanced in technology use will find the EHR technology easier to use. The personality traits of insecurity and discomfort were also tested, and the outcome was that nurses with insecurity and discomfort had a lower perception technology's ease of use. Their concern was how they would cope with using EHR in their daily work life. Likewise, nurses too who may accept EHR, were seen to face challenges when trying to use all the information in practice. The authors emphasized that EHR should be implemented where nurses are pre-screened for personality traits, and peer leaders without these traits could be advantageous when implementing EHR technology. Importantly, in their research (Aggelidis & Chatzoglou, 2009) and others have found other ways to implement EHR to enhance technology's ease of use and acceptance among nurses. In their 2009 study, these authors saw facilitating conditions as another factor that can affect nurses' intention to use technology. They define a facilitating condition as "the degree to which an individual believes that a satisfactory level of organizational infrastructure exists to support use of the system." Some examples of facilitating conditions are the installation of new computers, proper access to wireless internet and a good IT help desk ready to provide support when needed. Although a detailed explanation concerning the organization's efforts was not given, nurses who participated in the training programme and received support from the organization before and during implementation were likely to accept EHR. These authors mentioned that training and facilitating conditions are two factors related to nurses' technology acceptance (Aggelides and Chatzoglou, 2009). Another researcher conducted studies of TAM model variables, seeing training as an independent variable for EHR implementation that is vital to enhancing nurse acceptance. However, only a few studies have examined this aspect of training as an independent variable. Significantly, training in an organization is essential though it was mentioned as a facilitating condition. It remains an important aspect of EHR acceptance for nurses. The applicability of EHR was also studied by (

Ketikidis et al.,2012). They discovered that nurses who understand the importance of EHR would accept EHR technology. The applicability of technology acceptance to nurses is the same as the TAM variable perceived usefulness when nurses value the technology and the goal of them using it for patient care. Three other studies investigated the influence of nurse's colleague's perceptions of and norms regarding the use of EHR (Aggelidis and Chatzoglou,2009, Ketikidis et al,2012, Palm et al.,2006). Their studies found a rational relationship between the influences of peer's behavior. Their findings showed that peer influence may arise among nurses who have confidence in their colleagues who have been using EHR and have much technical experience. This set of nurses would like to work more with their colleagues with experience. Without such peers, colleagues would work independently, which might impact the level of acceptance of EHR technology.

Another model that aimed to understand user acceptance of technology was that of (DeLone & McLean, 2003), who updated their model developed in 1992 after a series of tests. The model was modified in 2003 with the assumption that information system success can be successful only if those using technology such as an EHR are satisfied and are willing to use the technology and are currently using the technology. They argue that the success of a system depends on its use rather than on how well the system is implemented. The purpose of using technology and user satisfaction was influenced by three main variables: information quality, system quality and service quality. Information quality can be expressed as follows: when utilized, does the technology provide relevant and valuable information to end users. In a healthcare facility where an EHR is adopted, this will mean that the information is current and precise, and that sufficient information is available to foster clinical decision making. Also, system quality is not referred to as the usefulness of information, but as the functionality of the technology in the environment. If EHR technology functions well, activities can easily be done across different departments in a healthcare facility. Moreover, the functionality across departments will reduce the time it takes to obtain information. In contrast, the system's complexity might cause tasks to be incomplete and make the use of the system more complicated. Lastly, service quality is the assistance provided to end users to foster their ability to utilize the technology. Service quality in EHR can come in the form of education or technical support that is always available to assist in difficult moments. Other ways to assist nurses include e-learning modules and pocketbooks (DeLone & McLean,2003).

Although both researchers tested information quality as an independent predictor of technology acceptance, no recent studies have confirmed this. However, information quality remains vital to EHR acceptance among nurses. A study measured system quality by ease of use, time response, the time needed to access information and confidentiality (Palm et al., 2006). A system response rate with fast connections is significant and can increase the technology acceptance rate among nurses. Also, (Palm et al., 2006) researched service quality as an independent variable influencing EHR satisfaction and usage. They specifically observed the usefulness of a support line that was made accessible during the technology implementation, together with training and good computers, all of which were seen to facilitate conditions in the TAM. They recommend that a prominent level of service quality would contribute to nurses' use of EHR in healthcare facilities.

3 METHODOLOGY

3.1 Research design

The purpose of this case study is to understand health personnel's view of and willingness towards a transformation in the method of handling of patient's data from a manual method (use of consultation books) to a digital service. First, having defined the research problem, the research question was formulated. The research design for this study is exploratory mainly because it helps the researcher to obtain a better understanding of the research topic through literature review and structured interviews. This design also assists the researcher in gradually understanding the cause of the research problem and in finding ways to facilitate decision making (Myers, 2020). Moreover, this design type is flexible and can be changed based on new insights and data gained from the research process (Saunders et al., 2012) .

3.2 Research method

The research method used is qualitative, and the research strategy is a case study because it allowed the researcher to explore the situation in question using a naturalistic and emergent research design (that is, it can adapt to latest ideas and findings throughout the research process) to enable the researcher to identify themes and patterns and thus create a theoretical framework

(Saunders et al.,2012). Moreover, qualitative research with an inductive approach allowed the researcher to study the subject in-depth while drawing existing knowledge on the topic from the reviewed literature.

The design maintained a purposeful and naturalistic approach to enable the researcher to gather detailed information about the phenomenon associated with a case study, this strategy helped the researcher understand the research context.

3.3 Data collection and sample size

Data were collected using in-depth interviews and diary accounts to obtain meaningful data through words. Moreover, using the proposed technique allowed participants to share their experiences and views with the help of the research questions. Moreover, using the technique mentioned earlier as a means of collecting data is vital because the people chosen to take part in this interview are seen as participants in the data collection rather than respondents. The sample responses were therefore suitable and reliable to provide relevant information on this topic.

The reason for this sample is to understand whether using consultation books to save patients' health information is appropriate in providing healthcare now and in the future, as well as HCPs willingness to embark on a change process.

Data was collected from six medical doctors and six doctors' assistants (nurses) from two district hospitals in the selected region. This sample is a term purposive sample because it was seen to be the direct target sample with which to begin the transformation process. All these participants were chosen based on job specifications such as job responsibility, positions, durability of service and the same level as for nurses.

The chosen participants were contacted via telephone to inform them and obtain their consent for the interview. Later a proper letter of consent was sent to them to explain the purpose of the research and the plan of action to prepare them for the interview. To prepare them well, several days before the actual day of the interview, the theme was sent to all participants.

3.4 Data analysis

The data were analysed with an inductive approach. Using this approach, the researcher analysed the entire process, starting from individuals' perceptions to a more general understanding to identify categories and critical themes. This allowed the researcher to comprehend the data while developing analytical categories further to identify relationships and patterns for further exploration (Saunders et al., 2012). The data was analysed based on Gioia's methodology (Gioia et al., 2012) The data was organized into 1st- and 2nd- order categories to create aggregate dimensions. The 1st order (codes) comes from the responses from the interview data, and the 2nd order (themes) are where the researcher looked for similarities and how they were connected. After this, comprehensive aggregate dimensions were formulated.

The researcher started by transcribing the collected data into textual form to obtain meaningful information from the data collected. Afterwards, the data from each participant was read individually to remove words, exclamations and names mentioned during the interview from the transcribed text. Again, the transcript data was reread with the written memo during the interview to help conceptualize the data.

Then the data analyst began by coding the data, words, sentences, activities, and concepts were labelled, and other relevant information that the interviewees mentioned was coded in first instances, which were given 35 codes. The researcher went through the codes repeatedly, 11 codes were found not be useful, and 24 codes that were seen to be the most relevant were proceeded with as first-order codes.

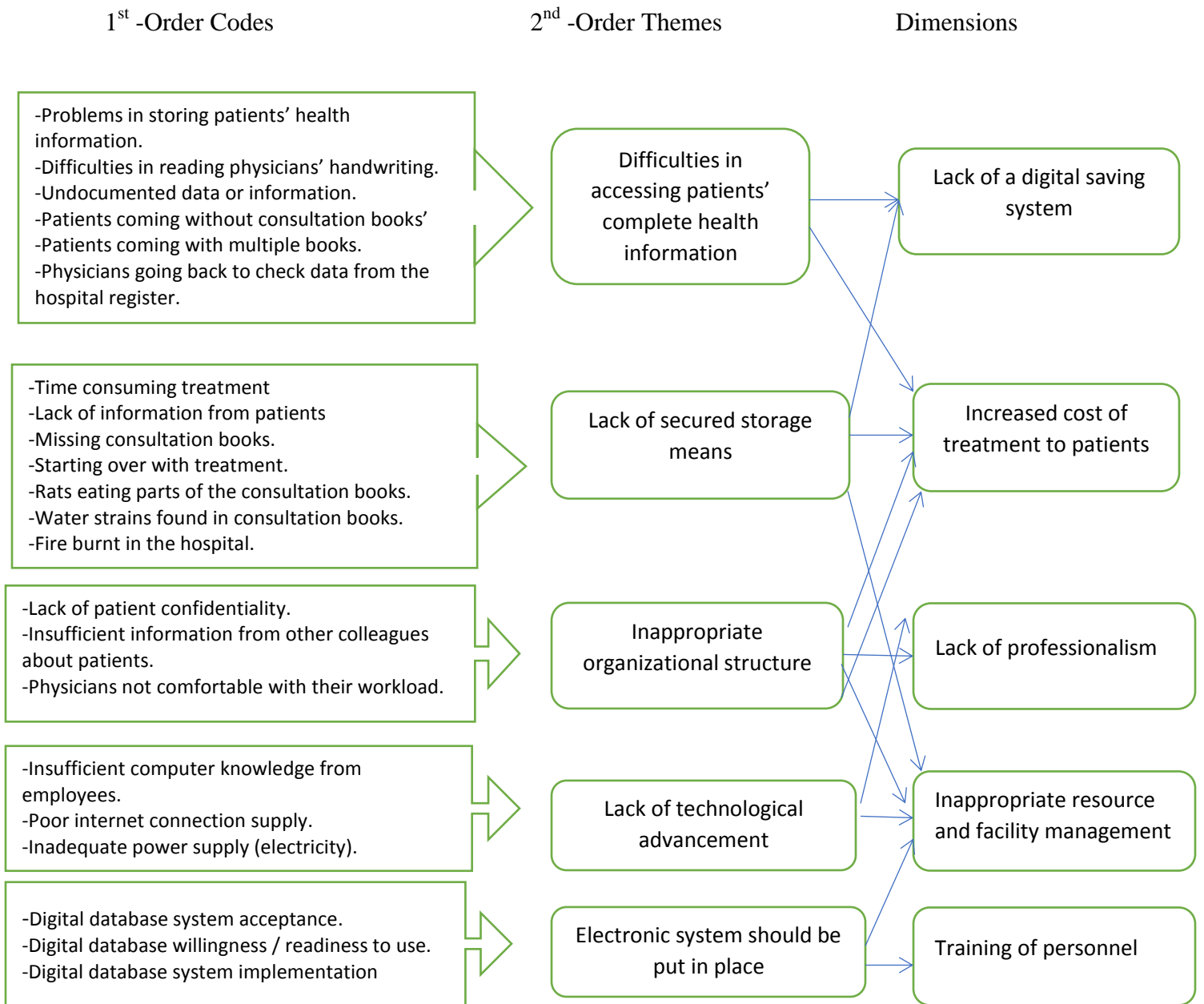


Figure 1: Data structure of coding

3.6 Ethics & Trustworthiness

Ethical issues guided the entire interview process before and during the interviews. Regarding the organization and its personnel, it was worth considering the research ethics that would make the participants feel secure will want to participate in the interview. A research consent letter and

research permission written by the researcher and supervisor were sent to all participants before the interview date. The letter's purpose was to seek their consent to participate in the interview, whereas the research permission from the school was to assure them that my institution was fully aware of what I planned to do.

Participant's confidentiality was considered by assuring them that their contributions or views would be used for my thesis work. Any potential identifying values to linked participants would be eliminated to ensure respondents anonymity. Non-maleficence regarding this interview was discussed. Also, the nature of the interview as a one-on-one phone call was described. The data would be recorded and saved during the interview to enable the researcher to access the transcript later. It was stated that the recorded tape would be destroyed when my final thesis was published.

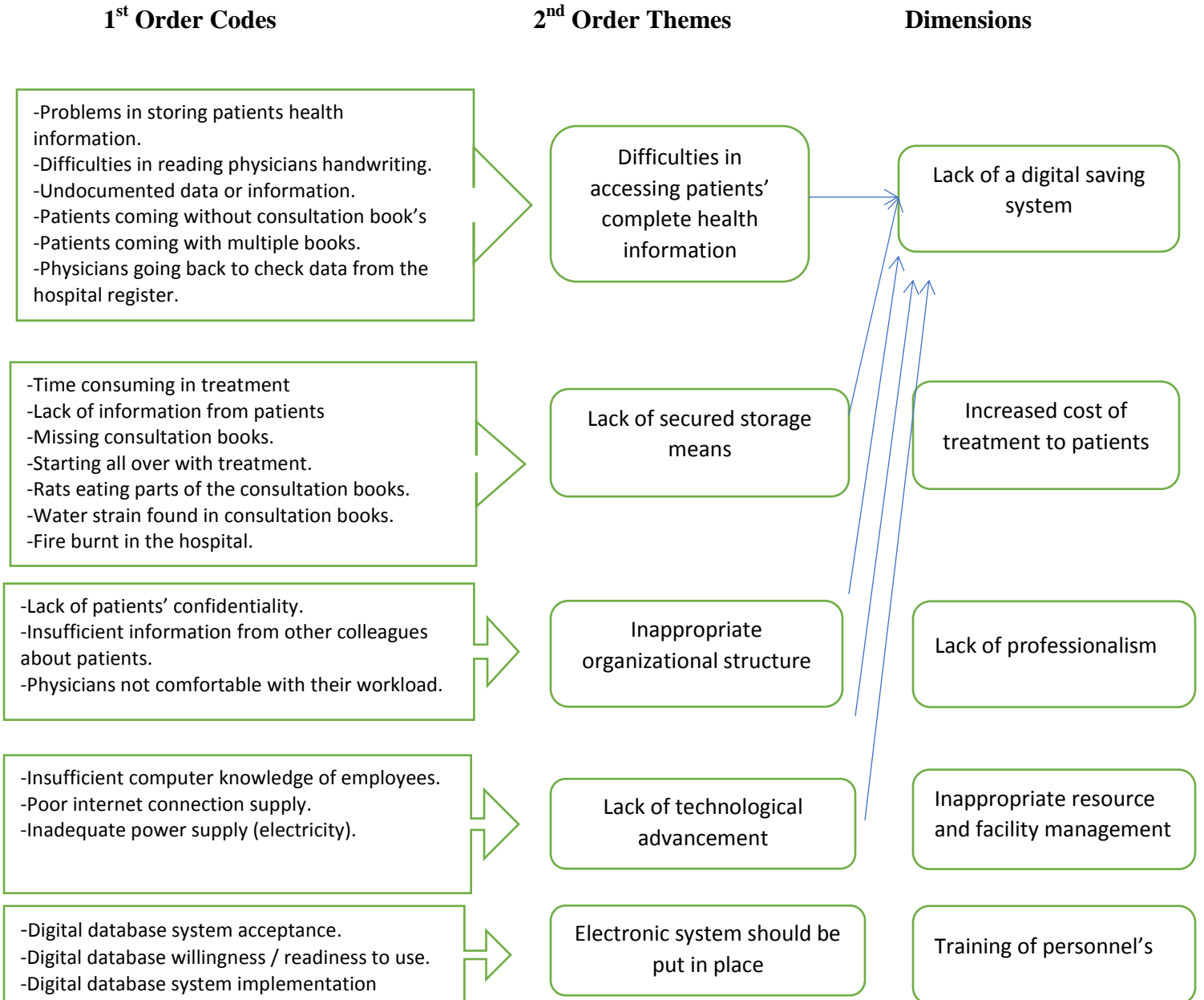
4 FINDINGS

In this chapter, a detailed presentation of the findings is presented. In response to well-formulated interview questions, the interviewee could give their responses. The interview questions were related to the following five themes, the lack of a digital system, increased cost of treatment for patients, lack of professionalism, inappropriate resource and facility management and training of personnel. Data was collected from 6 general practitioners (GP) and 6 outward nurses, given to 12 participants. Confidentiality was taken during the interview, and the interviewee was coded as GP-1 to GP-6 and ON-1 to ON-6 for outward nurses.

The Gioia method aided me throughout the analysis to create the 24 1st-order codes, which were identified as the most relevant codes when analyzing the data. These were later combined to form five 2nd-order themes, and in connection with this, five aggregate dimensions were created. These dimensions were used to explain the findings from the interviews and the literature reviews regarding willingness for a change in handling patient's data from manual to digital.

4.1 Lack of a digital saving system

The need for a digital system as an aggregate dimension arose from the traditional practice of handling patient health information manually and from the difficulties physicians face when trying to access patients' health information either from patients or the hospital health register.



Most of the GPs (General Practitioners) and nurses expressed difficulties in accessing patients' health information due to the way patient's information is being saved and how some of their colleagues handwriting makes the work more difficult when trying to read what others have written.

It is challenging because when looking at a patient's books and wanting to check their information, the handwriting is not clear. Secondly who writes the information, handwriting varies when checking their pass records. Going back to review from the hospital register is mostly difficult, the handwriting is no longer clear or visible. (1#).

It is a bit challenging. The first is eligibility, sometimes having problems reading what a colleague has written concerning a patient. Secondly, patients' records are not always available especially in emergency settings, sometimes you find yourself with a patient without any medical records making it difficult prior to consultation. And it is more challenging because some key information can be needed to guide a treatment that you need to administer to a patient. So it's also a bit cumbersome like to keep such record and also about safety, many at times I have had situations that I was told by a patient that she has record of her medical issues and then, for some reason the house got burnt and all the record will be missing and it becomes very difficult to treat such a patient.(1#).

This is a situation in which the health facility does not have a proper or secure way of saving hospital registers of patients' health information.

Talking on the side of the hospital, they will go and packed all the filled health registers somewhere that one can't get access too, for example where I was working before, it happened that the hospital got burnt and some of the patients who came to collect their result, especially for cancer patients whose samples was send to another hospital for test, came and was asking, the GPs said I can't lied hands on and it's not my fault as part of the hospital was burnt down and patients health information was also burnt down. For me if those information's were computerized, we would not have had such a situation. (1&2#).

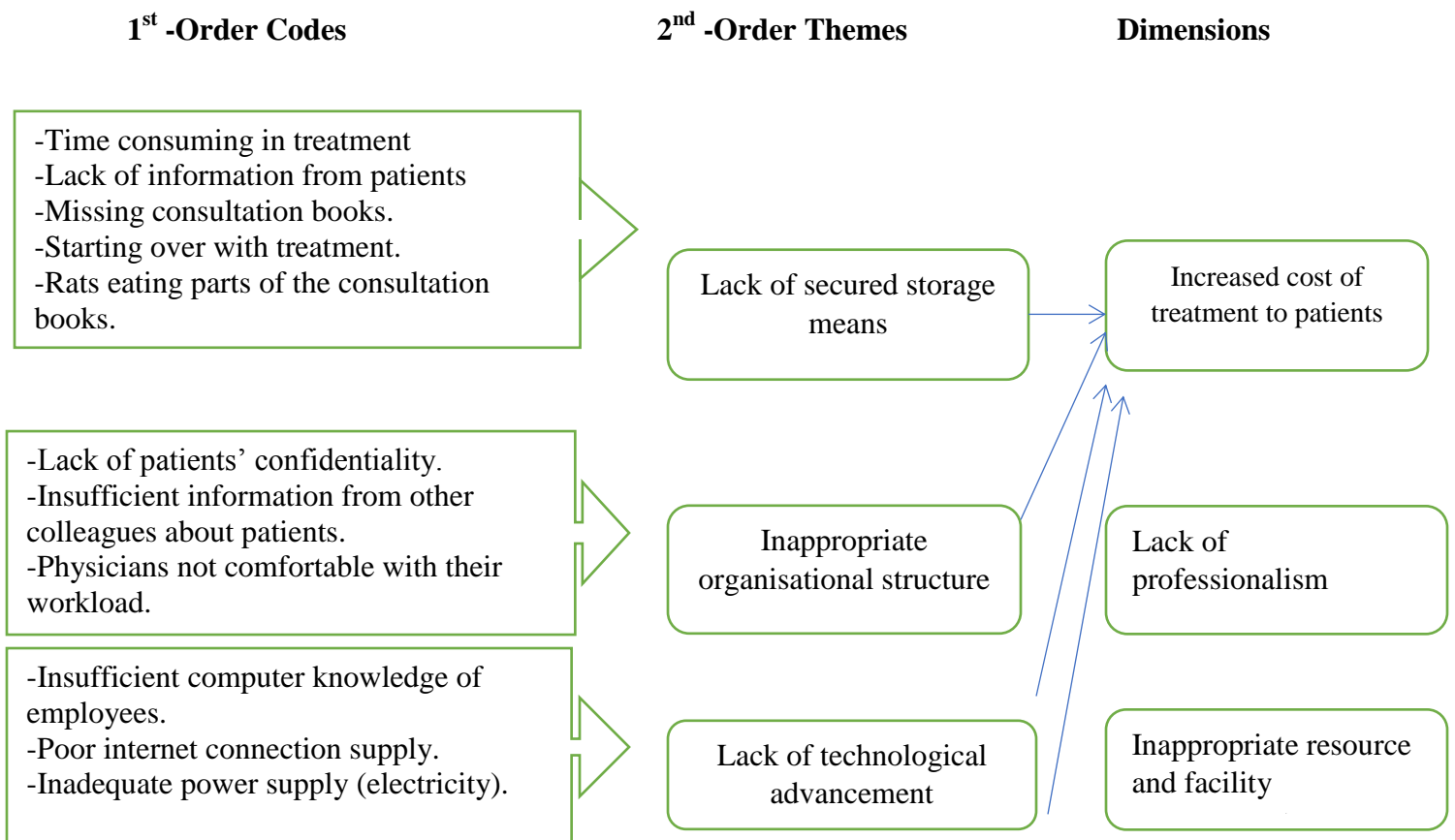
We have been having incomplete and missing data and it is stressful. The main problem is the incomplete filling of booklets and registers due to the time factor and space in the patient booklet. Many at times, especially on Mondays and Tuesdays the number of patients wishing to

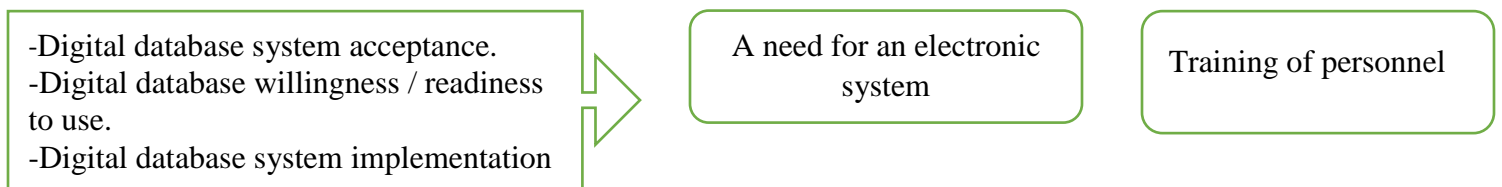
see that GPs is many, and every patient needs to be consulted. Due to time some GPs do not really write down all the health information concerning the patient, also their booklets do not have enough pages to write done all the information. (1#).

Well, most of the time, you ask a patient give me your past records she tells you Doctor; the book is missing or they come with some stained on it, some rats had eaten some pages making it very difficult, also in the hospital file, patients file are saved in a stored were it later get cold, open it you it's no more readable after a period of 3 months.

2.2 Increased cost of treatment to patients

Progressively many physicians and nurses expressed their views on the challenges they faced in accessing patients' health information due to a lack of secure means of storage in the hospital and due to lack of patients' knowledge regarding the importance that their health information be kept or secured by them. Eventually, the lack of a secure means of saving patients' health information comes with many consequences to patients and physicians.





It is difficult to understand whose responsibility it is to save patients health information securely. Many GPs expressed their minds concerning this situation as follows:

Incredibly challenging situation, seeing a patient ask him or her to come back in 1 or 2 weeks, he goes and come back with no record, sometimes you go back to patient's files but not all time it is successful due to time and the situation at hand. But with the book at hand one can easily read, so most of the time we must start treatment all over, which is time-consuming and sometimes very costly to the patient. A description of a patient's treatment, like kidney patient, who might have misplaced some of his medical test results, becomes a problem to continue treatment without the previous test results. (#1)

Starting all over again, I faced this problem when consulting, sometimes a patient tells you that the book got missing, then we need to start cracking this patient all over again. And the whole thing becomes difficult because seeing a patient that you have seen before, the second visit should be a follow-up and easier. But if information is missing, you must start all over and it is even difficult for the patients because you must do what you have done in previous consultation. This one becomes a broaden to both the patient and the GP. For the GP you need to go back and ask all questions and the patient will need to re-do the test that has been done before. (#1)

I was saying that the difficulty with books is that patients come with many different books, and you cannot do follow up treatment especially the clinical background of a patient. Each time they come for consultations they come with a new book, making it difficult, especially coming from another area, also the books are exceedingly small making it difficult to write down everything. (#1)

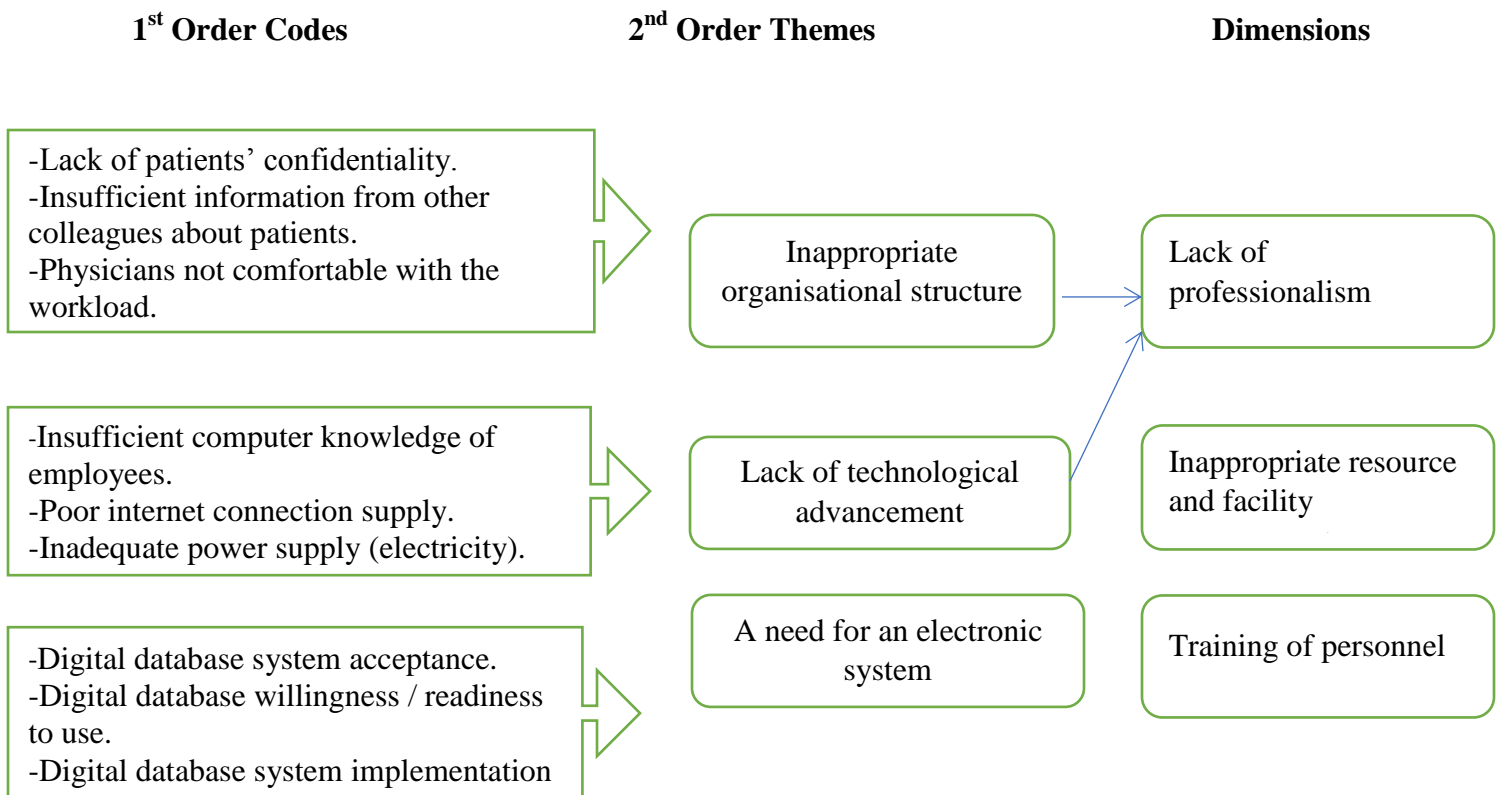
Many physicians mentioned how displeased they were with the several ways patient health information is being handled, as it is reducing the quality of healthcare they provide to patients.

Sometimes, job satisfaction is missing, because physicians struggle to manage treatment with patients who must have misplaced their books and thus sometime need to re-do tests.

Sometimes patients are not financially liable and eventually cannot redo all the tests as requested. As a doctor all I do is to choose which test to do and drop the others. I know it is not good practice. (#2).

4.3 Lack of professionalism

When looking at the organizational structure and ethics, it was noted that there is a gap in the management of patient health information which has led to a decrease in professionalism among physicians and nurses.



Presently the poor organizational structure has caused us to have too much workload. This happens all the time and causes fatigue in the professionals. Sometimes we are in a haste to consult or treat a patient and have limited time to document everything on the health register. It is sad because everything concerning a patient needs to be written down, which does not happen all the time. (2#).

Patient's confidentiality is sometimes lacking with some physicians, for example we had a situation where a nurse wanted to know what brought a particular patient to the hospital, her intension was not to contribute to treating this patient but to share the patient health information with an outsider who is not a staff. (2#).

As I earlier said, one of the difficulties would be the non-extensiveness of information, like I may need a little information concerning an event prior which was not given this will create some difficulties. (2# & 3).

Physicians sometimes face lawsuits because of poor documentation, we have had a case here where a physician could not backup his or herself due to poor documentation. (2#).

Employees feel that the health sector or facility is not working hard enough to help them do their jobs effectively. When it comes to professionalism, they struggled to manage everything happening around them.

“If we can't get proper help from the ministry of health, the inner management should take up the responsibility to help physicians to their jobs effectively, that is by providing enough GP's and resources to do their job, hence protecting them.” (#12)

4.4 Inappropriate resource and facility management

This aggregate dimension is seen as the direct responsibility of the Ministry of Health as mentioned by some of the interviewed professionals.

1st Order Codes

2nd Order Themes

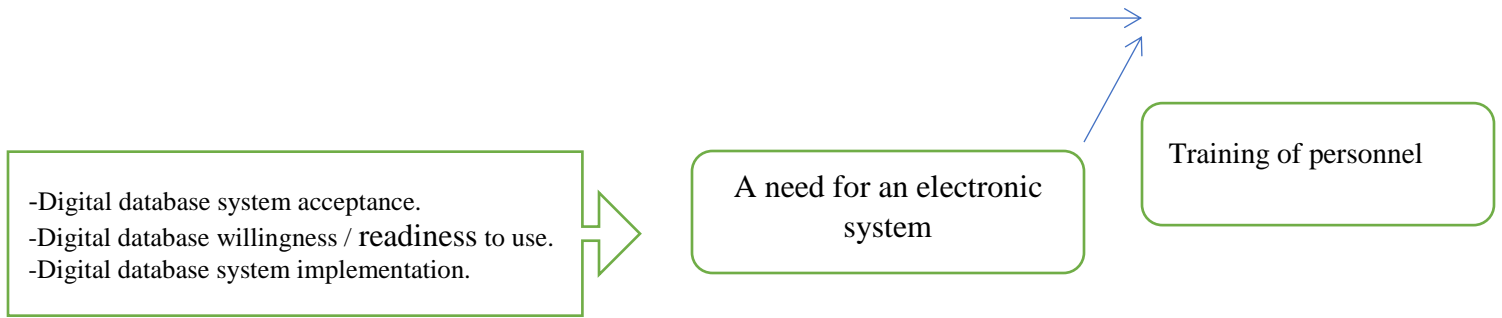
Dimensions

-Insufficient computer knowledge of employees.
-Poor internet connection supply.
-Inadequate power supply (electricity).



Lack of technological advancement

Inappropriate resource and facility management



Some interviewees expressed how they had read from books, heard from friends working abroad and seen in movies that incorporating information technology in an organization can increase productivity. One interviewee said, “I enjoyed seeing nurses drafting reports using computers, checking things on the computer with colleagues and using inwards devices to assist patients.”

For me we can use the electronic health record (EHR) and the consultation books alongside, using one is not enough. Because when I was a student I used electronic way of saving patients information. When we consulted, we filled in all the information on the computer, but a day came, the computer had a problem and all the information put in the system went missing, but I do not know what happened. That is if you can write the medical record in a computer and write a small summary of the patient in the book, so that you have 2 ways to keep the patient's information, they were just starting, meaning consultation books should not be left out completely for the start. (#3)

Many mentioned their frustration with the poor network system and how the electricity supply in the country is not efficient, which is presently a challenge they face in their daily work life.

Moving from manual to digital is good, but in our country, there are other things we must put in place for this new system to work. Especially our network system, this is the main issue, because if you keep saving patients records in computer software and someone cannot access them it is of no use, also they must work together with other stakeholders to make things work. (3#)

This interview is like a coincidence. “This research topic is exactly what we have been discussing in our administrative meeting in the past said a nurse.” The formal 2 directors of the hospital tried going for the electronic way of storing patient's health data, just after a year or so,

it was abandoned, and they must come back to the old ways of using patient register or files. But the electronic health system is the best, why do I say so, because one can always have access to data anytime of the day you want, unlike the files that have to be packed and send to the store accountant office and you can't consult or reach him at mid-night to come and open his office because you want to get an information, and you can't call him to come at weekends. (5#)

"The second limitation we have is persistence power storage (electricity which makes the system exceedingly difficult to manage. We stated using a generator but due to excess financial bills it was not possible." (5#)

"EMR, will be my first answer, but in our setting where I worked to be precise, the EMR can be with limitation in one point because if the system is in place, there will be a time that something will eventually come up, let's say the blackout (no electricity) or internet problem, the internet is not swift as in abroad, there comes a time that you are searching for a patient information but the internet is disturbing , because it use internet, so if the internet is not good , it will be difficult to access patient information or folder. Because I remember where I worked, they bought up this system for outpatient department and all we do was to store the complete information concerning the patient, and when the patient goes to the Doctor with the code given by us, it makes it much easy for the Doctor to consult the patient, but it didn't it last because the Director who brought up the idea was transferred". (#5)."

"Yes, am for it, that they could change everything from manual to digital, but before implementing it, they should work on the networking issues before a switch." (#5&6#).

However, some interviewees describe their lack of computer skills as not incorporated in their curriculum during studies.

"All those mentioned, am good in some and excellent in a few. Excellent in excel and word, managing database, good in schedule appointment and if l can be put through within days, everything will be fine. (#7)

"Excel only, for other aspect l will need training for am very lacking in the rest. (#7)

"Computer skills or basic computer skills should be something we have to learned during our studies together with data management systems, we are rather unfortunate ". (#7)

“If thought in school during medical practice it will be more beneficial to us all.” (#7)

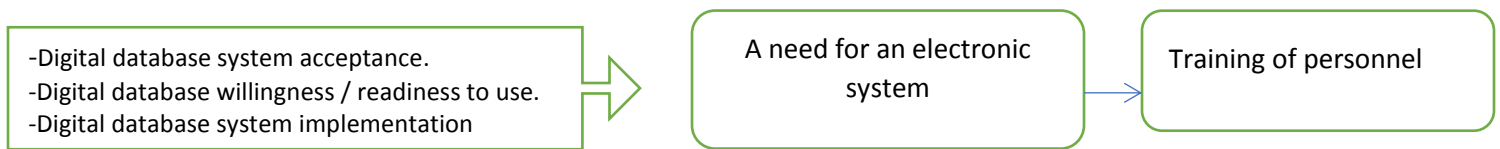
4.5 Training of Personnel’s

This last aggregate dimension expresses the views of the interviewees regarding the change in handling patients’ health information and how they would want the change to be implemented.

1st Order Codes

2nd Order Themes

Dimensions



“Yes, it is necessary, I remember when I was in school, I will have to manage to type my report, so if shown the way to do it, I will do, if necessary. One time the facility came up with an electronic way of saving data, but it did not work. So, I choose we can be learning and doing things at the same time. (#6).

“Yes, because I already have a taught that this data manual data is not really the best, because information is not kept, cannot be retrieved easily and mostly confidentially is not the best. If the electronic system must be re-enforced in Cameroon. I will seriously admire it and will like to practice it, even to go for training will not be a problem. (#5).

“If I say it is not going to be beneficial then I will be speaking out of ignorance if there is a transition from manual to digital data handling. It is going a long way to improve on patients outcomes and the overall management of patients, because patient will not need to be followed up in certain ways for examples many patients travelled and get sick but still have to travel back to their city because they think, the I Doctors there do have good mastery of their history and in most cases they don’t have their records, so if there’s a transition to digital handling , I think the management of patient will become very easy, because patient’s can be managed irrespective where they fine themselves. Therefore, complete information about a patient can be retrieved and understand what has been done and what still needs to follow up. (#6).

“Electronic medical record, (EMR) is good but we have not been trained for that, due it takes time to write on the book, but if we have EMR, we need training for that, if trained, it will be good. The transitional period will have problems but obviously when everything is stable it will be better. (#5).

“Yes, am willingly for a change, provided it comes with all the resources” (#6).

“Yes, I am willingly but not everyone is vest with such a system. Not all employees are computer literate.

“Yes, that will be a dream come true, because it will be easier to share with your colleagues for discussion with an electronic health system, a case concerning a patient can be sent to colleagues easily rather than if using books. Sometimes I take a picture and send it to colleagues for explanation but sometimes I am having difficulties in reading handwriting, but with EHR everyone can read it. If a system can be put in place, it will help save money, time, increase efficiency and the outcome of patient management. (#6).

Interviewees expressed how they would want the organization to start implementing the change in their facility.

“Option 1(introducing basic computer skills) because if you ask nurses / Doctor to learn on their own, I do not think they will achieve a lot. From what I have observed, whenever they want to introduce something new, they will do something like workshop to train some staff and later those staff will come back to teach the others.” (#8).

“Option 3, introduction with digital software starting with Doctors” (#8).

“Option 1, to trained everybody” (#8)

“I choose 1 & 3, and the duration of time should be 1-3 months training”. (#8)

“If you ask my opinion, I will go for the first 3, because everyone needs to have a computer skill, so we can move gradually from step 1-3and also in-service training for 3months, thus we have tried and failed, it’s something that needs to happen in our facility together with an in-service training”. (#8)

“I prefer group organizational learning; you introduce basic computer skills if you are aware of what you are doing. Someone can be better than others, this person can help others in learning. That is get support from colleagues rather, if put individually some will excel while some will stay behind, which will not be good, rather it is good to have organizational learning so that help can come from colleagues that are good or fast learners and can be motivated as well” (#8).

5 DISCUSSIONS

In this section of the report, the findings are discussed, and the interpretations of the findings are supported by previous research. The five main aggregated dimensions, based on the analyzed data are the lack of centralized digital saving system, increased cost of treatment to patients, lack of professionalism, inappropriate resources and facility management and training of personnel.

Despite the innovation in digitalization, many healthcare services still want to avoid adopting information communication technology, hence slowing the provision of healthcare, and risking its quality as well as patient’s confidence in their services. As (Gagnon et al.,2014) emphasized the fact that healthcare professionals are the most relevant people to express the difficulties faced and their wishes for information communication technology in service. According to (Akanbi et al., 2012) they mentioned how African governments’ healthcare institutions are slow to adopt eHealth to improve healthcare quality. In the following chapter the five above mentioned aggregated dimensions are discussed.

5.1 Lack of a digital saving system

Many factors contributed to the lack of digital saving system in the sampled hospitals. Despite the recent technological advancement in healthcare, these two facilities sampled still need to adopt information technology systems when handling patients’ healthcare information. It is relevant for healthcare services to have patients’ healthcare information stored using a digital system as (Ladan et al., 2019) stated that information and communication technology together with eHealth will enhance healthcare professional’s ability to provide quality healthcare to their patients likewise improving their clinical practices.

(Verhoeven et al ,2009) mentioned four categories of factors that can influence the adoption of modern technology and the capacity to which this technology will be accepted and used by healthcare professionals. Technological factors, individual factors, work-related factors, and organizational factors can all potentially cause a healthcare facility to be reluctant to incorporate healthcare technologies. Most of the interviewees cited inadequate infrastructure and network connections as the main reasons for not having these information systems in place, which can be seen as organizational factors. (Aggelidis and Chatzoglou,2019) supported the fact that facilitating conditions play a significant role in adopting modern technology, as an individual will believe that the organizational infrastructure is all in place to support the use of a new technological system. Many older professionals who have been there since 2012, testified that information technology had been implemented once but failed to be sustained by the health facility.

Physicians and nurses expressed the difficulties they encounter in their daily work life with patients' especially when retrieving some patients' past health information that was stored or written in the consultation books. Many professionals disliked the fact that in the 21st century, they still used consultation books to store patients' information. In using consultation books, many physicians had difficulties reading the handwriting of their colleagues, and the sizes of the book's dues contributed to the many undocumented patient's information. A review from (Gagnon et al 2014) emphasized that with the increase in computerization in every unit of activity, ICTs are expected to become a key tool of healthcare professional practice. (Buntun et al 2011) argues that some HCPs will still want to do things traditionally and will not welcome changes despite the potential of this technology to improve the healthcare of individuals and likewise increase the performances of healthcare professionals. Both researchers stated that incorporating technology in every sector of activity would improve the quality of health services, save costs, and engage patients in their own care.

5.2 Increased cost of treatment to patient's

One of the consequences of using consultation books and not a digital system is the increased cost of treatment to patients, time consuming treatment, missing consultation books, and starting treatment all over. Many physicians feel exhausted in their daily jobs. They are usually not satisfied with their daily practice because relevant patient information needed for proper care administration is usually missing during treatment. As (Buntun et al 2011) have said if technology is implemented and adopted in all units of activity, the quality of healthcare services will improve, and the cost of treatment will be reduced. (Berger and Kichak, 2004) agreed that proper EHR systems have the potential to reduce medical errors and in turn, health costs if HCPs accept the system in their daily clinical work.

Other research reviewed did not discuss or reveal the increased cost of treatment due to the handling of patient's health information. Instead, medical errors were discussed as a reason healthcare professionals should accept and use EHR systems to save patients personal and health information.

5.3 Lack of professionalism

In healthcare organizations, work and moral ethics are expected from all professionals when rendering services to patients. When patients are confident in the knowledge that their health information and personal information is secure, they trust the healthcare facility and healthcare professionals when they visit it. Moreover, a patient who has trust in an HCP will be open to discussing their medical issues with physicians without fear of information mishandling. Patients' confidentiality was more of a concern to physicians as many interviewees were disappointed with how other colleagues handled patients' information within the healthcare facility.

It was surprising to learn from nurses and physicians how their colleagues managed patient information, some said they usually needed more information concerning patients from other colleagues. Often, a patient's consultation book is not up to date regarding past visits with

physicians. Patients usually provided more explanations than were written in the book. Patients' health information is vital, as (DeLone & McLean, 2003) expressed in their study, the exchange of health information is fundamental to healthcare services. They emphasized that the future of healthcare depends on how hospitals health professionals are willing to engage patients and earn their trust in managing their health information. According to (Brammer et al., 2012) explained that to enhance the standard of healthcare, hospitals need a prominent level of collaborations among practitioners who have the mindset of accepting changes through change management and strategies for accountability care.

Many physicians saw a gap in work ethics in their facilities, as they are usually uncomfortable with their workload especially on Mondays, Tuesday, and Thursdays. The reason for this is that the ratio of patients per physician is quite high, given that all patients these days need to be consulted. This gives the physicians limited time to write down every bit of information received from the patients. Consequently, many professionals usually deal with inadequate information in their daily jobs. Every healthcare facility needs to practice patient safety (Nie et al.,2013). They must develop a culture of providing comprehensive quality healthcare to patients. This aspect was different in this study. However, healthcare professionals must be knowledgeable and skilled enough to understand what is required in their daily activities to provide appropriate healthcare services to patients.

5.4 Inappropriate resources and facility management

The most outstanding reason for physicians' continuous use of consultation books was inadequate resources for digital systems to save patient health information. Many interviewees described their level of disappointment experienced in 2012 when an EHR system was first introduced in the facility. They believed that system failure was due to the facility's lack of resources and the need for better management during and after the implementation of the system. The complete failure of the new system was attributed to poor internet connection, inadequate power supply, and inadequate computer knowledge of HCPs; hence the traditional ways of handling patient information were re-introduced.

In most studies done on information technology, researchers' concerns were about technology acceptances among professionals rather than the lack of resources and proper management. This

was also seen in a study by (Zayyad & Toycan, 2018) in which they described the level of eHealth adoption in Nigeria as extremely poor due to poor infrastructure and lack of policies towards eHealth in the country. Cameroon's main power supply system is under the national grid with ENEO (Cameroon national electricity utility) control. When there is no power supply, there is limited or no internet. The rationing of the power supply in the region makes running the system in a healthcare facility tricky. Some of the interviewees stated that for proper implementation of an EHR system in their facility, there is a need for a stakeholder responsible for providing a standby generator to provide electricity during failure from the primary provider.

In addition, (Aggelidis & Chatzoglou, 2009) made it clear that the EHR implementation process can be manipulated to enhance the ease of technology acceptance and adoption by healthcare professionals by providing a satisfactory level of infrastructure to support the use of the system. They described this as a facilitating condition that would act as a push factor to ease adaptation, such as installing new computers in every unit, providing good wireless internet, and providing an information technology support system to help professionals when needed. As (Ami-Narh & Williams, 2012) argued, most healthcare facilities might find it challenging to provide all facilitating conditions, therefore he emphasized that for a healthcare facility to succeed in eHealth adoption, there is the need to involve stakeholders in every step of adoption.

A review process of handling dental patients' data between digital and paper media was investigated to understand which implementation process would serve as a lesson learned in implementing value-based oral healthcare. The results showed that implementation begins from the healthcare facility itself, its willingness to implement change, and stakeholders' commitment. This finding of inappropriate resource and facility control was like that of Nigeria as mentioned above. This aspect did not match with other reviews, especially in developed countries with a consistent power supply and internet access in healthcare facilities. In developed countries, the main concern for professionals using EHR was their acceptance and use of modern technology.

5.5 Training of personnel

Interviewees said that although they are prepared for a change, they still need support from the organization in the use of modern technology systems. Also, during their medical practice, they

did not receive training on how to use digital health information systems to save patient's 'health information. (Aggelidis & Chatzoglou,2009) saw facilitating conditions as a factor affecting healthcare professionals' intention to use EHR. In their study, a more modified version of the Technology acceptance model (TAM) included training as an independent variable for technology acceptance among physicians. For nurses and physicians to accept EHR, adequate training should be provided to support the system's use. In support of this (Ketikidis et al.,2012) mentioned the importance of competencies and skills required to use EHR in daily work. Therefore, competency and skills can only be obtained from adequate EHR use training. In a contradictory study done by (Dansky et al 1999) on physicians' perceptions before technology implementation perceived usefulness was looked upon as follows (1) individual characteristics like age, computer experience, and patients care values (2) computer anxiety, and (3) contextual factors such as office conditions and organizational support. The results show that demographic factors have no influence on perceived usefulness but also that computer experience and perceived organizational support were seen as positive predictors of perceived usefulness for technology acceptance. They added that organizational support should not be limited to formal training but should extend to the infrastructure needed for proper implementation. In agreement with this (Lapinsky et al 2006) it said that technology-specific training should help physicians' acceptance.

Overall, no study mentioned whether professionals or sampled size received support or training during medical studies on using EHR systems to save patients 'health information digitally. To understand physicians' and nurses' technology acceptance, a technology acceptance model (TAM)was applied to evaluate users 'behavioral intention related to technology. The three variables of this model were perceived usefulness, perceived ease of use, and behavioral intention. To relate this model to the results found, 80% of the interviewees said that the perceived usefulness of an EHR system would increase performance and enhance their medical practice, if not now, then in the long term. These professionals did not mention whether they were worried about the new system and if it would require their effort. The reasons were that they have pre-knowledge about the system, they have attended conferences on the importance of eHealth, are computer literate and have watched documentaries on the importance of technology to healthcare sectors. In conclusion, they fell under the perceived usefulness variable of the

TAM. To support this, (Kuo k, and Liu C, 2013) they added that innovative or more advanced technology professionals might accept and use modern technology in their jobs.

Of the interviewees' responses, 10% were related to the TAM variable of perceived ease of use. They were uncomfortable that they had to learn a new system, and that the traditional way of saving patient information would soon end. They aimed for the new system to be manageable if implemented. This implies that 10% of employees will need organizational support and facilitating conditions to pull them to accept and use the EHR system. Furthermore, the remaining 10% were entirely out of the TAM variables as they wished to maintain the traditional way of saving patients' health information because it is what they have been using for decades, and they are more comfortable using the consultation books. However, they suggested that more emphasis should be placed on how patients can save their consultation books themselves.

Computer skills were also a factor that was seen as lacking among all the sampled professionals. Among those interviewed, 55% wished to begin training in the basic skills needed to use a new system within a duration of three to six month, whereas 30% preferred that staff be given the opportunity to do self-learning on an online tutorial platform provided by the facility/ stakeholders within a duration of three months or more, this would access which professionals are fast learners who could begin using the EHR system. Their purpose of this would be for the management team to identify which professionals could be of support to other professionals. This would also encourage other professionals to seek help from their colleagues who have started using the new system. To support this (Palm et al 2006 and Ketikidis 2012,) found that peer influences may be strong as peers might look up to their colleagues who already have some experience in saving patients' information using a digital system.

6 CONCLUSION

Information technology such as an EHR system is fundamental in healthcare facilities to improve the quality of healthcare services and enhance the performance of healthcare professionals. Adopting an approach like the EHR system to store patient information and facilitate the retrieval of health information can occur only if an individual HCPs wants to improve the overall quality of healthcare services provided to patients and the community. Technology acceptance

among physicians and nurses has been of great concern, based on the reviews, as well as certain barriers that have hindered technology acceptance and usage among professionals. A change from manual to digital ways of saving patients' health information is one of the most significant changes a healthcare facility can face. However, if the professionals are willing to change, the chances that the organization will succeed are much higher.

The research questions were geared towards health personnel's willingness to change from manual to digital methods of saving patients health information and the management tools needed to enhance the change from manual handling methods to (using a database management system) to improve patients care and well-being. Having established the aim of this study, the research interview questions were formulated, starting with the challenges healthcare professionals face when using consultation books to save and retrieve patients' healthcare information, whether they are willing to change from manual to digital ways of handling patients' healthcare information, and which management tools is required for them to embrace the change. Primary data were collected through semi-structured interviews with six general practitioners (GP, s) and six nurses. The theoretical framework and analysis from previous research revealed that despite the many barriers to accepting recent technologies in healthcare facilities, this study found a willingness from (HCPs) to change in many of the health professionals sampled and the appropriate management tools that will be needed to properly handle patient health information using a database management system.

The responses from six out of six GPs that were interviewed expressed their willingness for a change in patient information handling and five out of six nurses were also willing for a change. Reasons been that these HCPs have once used the digital system to save patients information. During that period, they experienced how fast they could consult patients because they could access some patients' health information from the system.

However, the change process is demanding as physicians and nurses expressed all the difficulties and challenges they faced when saving and retrieving patients' health information. Their willingness to change led one interviewee to recommend that if physicians were well trained to use the EHR system during their medical practice and the software were installed, the success would then depend on the continued use of the new software to achieve the change objective.

As HCPs are willingly for a change in information handling, many expressed that a successful implementation of a digital software needs that the management should be ready to acquire all the necessary management tools that are needed for the success for the change system. This result is related to research questions two as many researchers mentioned this type of management problem in chapter two as facilitating conditions and information system success as an independent predictor that organizations need as resources before implementation of the new software application system. The management tools mentioned by the HCPs were standard electricity supply, adequate internet connections and a stand-by generator, While the information system success will be the computers, system, and service quality together with HCPs system training.

I recommend that healthcare facilities should handle this change process with support. Stakeholders should become involved and contribute to business practices, and a business canvas model that highlights all key strategic factors that should be added when starting the implementation process. If done well, the barriers to technological acceptance might be eradicated. The first phase after implementing the EHR would be to provide a data management system (EHR) for saving and sharing patients' data with other HCPs. Later, patients could access, view, and download their health information online. Lastly, software providers and other stakeholders must constantly demonstrate the effective and efficient use of the system to improve patient care and reduce the mortality rate in the region and the country.

6.1 Practical implications

The researcher's findings show physicians and nurses willing to embrace the use of EHR systems if adequately implemented with all the facilitating conditions, especially (vital internet access and constant power supply), needed to provide quality healthcare services in the facility. The implementation team should monitor the training of HCPs in using this system to understand the skill level they must attain to use the system. Health managers and board members (community leaders) should devise a proper strategy to communicate the urgency of using this system in medical practices. Introducing a new system has costs, and it can sometimes be complicated. Therefore, all the change processes must be discussed and well-analyzed with the help of a

canvas business model before implementation begins. The healthcare facility can achieve the implementation of an EHR system with proper planning before and during the change process.

6.2 Limitations and suggestions for future research

The above research topic concerns how administrative staff handle patients' health information. Information retrieval is essential for proper health care and follow-up. It is evident that for a change to occur in an organization, it must begin with the staff or employees, knowing that it is usually difficult to implement changes, primarily when an organization has maintained a particular way of doing things for a prolonged period.

This case study aimed to change the handling of health information from a manual method to the use of digital services to save patients' information. However, this study was limited to understanding doctors and nurses' willingness to adopt the digital handling of patients' data. The sample size was six general practitioners and six nurses, for a total of 12 participants. For security reasons and travel costs, the researcher could not conduct face-to-face interviews with a larger sample to gain more insight from other professionals in different regions and better capture the professionals' emotions and behaviors during the interviews. It is also essential to know that the results cannot be generalized to the whole region or to all its HCPs. Further, the sample size should have included health managers and directors to understand which organizational issues they have faced in the past, as mentioned by the healthcare professionals. Therefore, to understand the administrative problems encountered during implementation, it is crucial to understand which organizational factors are essential to succeeding in the change process and thus begin using a digital system. In the future, quantitative research could be done by another researcher to understand the change management process and how organizational factors and policies can affect change in an organization, specifically regarding a shift in the handling and retrieval of patient health information.

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APPENDIX

Research interview questions

- 1) What has been your experience using consultation books to save patients' health information? (#1)
- 2) What difficulties have you encountered in retrieving patient's health information with the use of consultation books? (#1)
- 3) How do you deal with the challenges that arise when a patient's health consultation book goes missing? (#1)
- 4) How do you manage a patient's follow up without having their health history in place? (#1)
- 5) What has been your concerned about or taught on diverse ways of handling patient's health information? Using (1) an electronic health record (EHR) (2) electronic medical record (EMR) these are all diverse ways of collecting and saving patients health information digitally (3) or consultation books. (#2)
- 6) What is your taught if changes are made in saving data from manual to digital database? Are you willing for a change in patients data handling? (#2).
- 7) What computer skills do you have in terms of (1) managing database (electronic health records system) (2) drafting reports (3) scheduling patient appointments, (4) suggesting personalized diagnoses and treatment plan (5) processing billing transactions (6) using excel and word in Microsoft? (#2).
- 8) How do you want the organization or leaders to implement the change? (1) Introducing basic computer skills (2) giving staffs the opportunity to do self-learning or organizing a group learning by the organization (3) later introduction to digital service software (electronic health records system, starting with Doctor's follow by nurses' assistance (4) or not necessary for a change? (#2)

- 9) What is your awareness in saving patient's data digitally, from different colleagues from other hospitals? (#2)
- 10) How do you as a professional in your field manage patients' safety in relation to (1) Safety care, (2) Timely Care (3) Efficient care (4) Patient centered. (#2).
- 11) Based on your experiences at job, what do you have to say relating to the change of data saving?
- 12) What else would you like to add concerning this topic?

FIGURE

Figure 1. Data structure of coding