Introduction

1.1 Background to the Study

An Electronic Medical Record (EMR) is a computer system that includes hardware and software technologies for capturing paper-based documents as scanned images. Metadata is then assigned to these captured images and taxonomies that are created for indexing them. Electronic Medical Record software functions include capture, storage, classification, indexing, versioning, maintenance, use, security, and retention of health care documents[1].

An Electronic Medical Record also includes technologies for receiving and storing digital documents such as computer output laser disk (COLD) documents, including lab results and transcribed reports for electrocardiograms (EKGs) generated by other computers. At times, Health Information Management Professional might confuse an Electronic Medical Record software with an imaging or scanning machine; but while the latter only allows for the retrieval of the digitally captured documents, Electronic Medical Record software offer work-flow functionalities, sophisticated reporting, work queuing and the ability to manage health care documentation based on a predetermined logical scheme[2].

Formerly, preventive, therapeutic and rehabilitative care were based on traditionally paper-based documentation of clinical data looked into or utilized for clinical, investigative or research and education, administrative and monetary purposes. It was extremely constrained in terms of multi-use, accessible to as it were one client at a time. The paper-based records are manually updated to recency resulting in delays in completing records. Most clinically generated record offices were domiciled in institutions' ground floors and basements as the weight of the paper excluded it from occupying any other decked or suspended floor areas. These shortcomings necessitated operational changes for better practice and birthed technological

approach which promises to increase access to health care, improve the quality of care and health, and decrease costs. Patients rarely viewed their health information until most recently when electronic medical records came on board solving the numerous aforementioned challenges and also introducing its accompanying negative sides especially with regards to breach of medical ethics such as confidentiality/privacy in the provision of medical or clinical services. An electronic medical record (EMR), is a digital version of a person's overall medical history. EMRs are maintained by one provider, but can be shared to specialists and other medical caregivers when needed to maintain accurate information. All key clinical data that is relevant to the development of a treatment plan is maintained in this one file. This work briefly highlights two measures of EMR usage namely Frequency of Use and Purpose of Use of EMR[2].

Frequency of Use of EMR in adopting an information system, must be of a level of importance to elicit and justify regular usage in the provision of healthcare services. This is necessary to validate its need and subsequent utilization without duplicating function or creating waste. The evidenced rate of utilization of electronic medical records in Healthcare practice measures the value or worth attached to the deployment of the software to improve on the pre-existing system. This rate-of use measure, reflects the true state of events whether EMR practically accomplishes the tasks for which it was adopted or if it is deficient. Increased usage traffic is an indicator of viability and versatility of EMR while decreased usage indicates that the software is not performing and is a misfit[3].

Purpose of Use of EMR must indicate a demonstrated gap or problem which requires EMR-specific solution or intervention to justify facility resource investment and adoption. EMR usage must showcase sterling improvements over previous system to provide conviction to migrate to it. EMR promises improved safety, improved quality, standardization, timeliness, cost-effectiveness

among others. On attainment of the landmark of facilitating premium safety and quality at affordable cost, EMR adoption rate will hit the roof based on technology-task fitness. The reason for utilizing the facilities of electronic medical records which is also the justification and objectivity of intention to use electronic medical records is a major determinant of EMR usage.

Electronic Medical Records (EMR) are tremendously valuable in retaining and exchanging patient data. The Health Insurance Portability and Accountability Act (HIPAA), Health Information Technology for Economic and Clinical Health Act (HITECH), Nigerian Information Technology Development Agency NITDA and The Nigerian Data Protection Regulations (NDPR) impose strict requirements for ethical practices such as data confidentiality/ privacy and security which are very important due to the sensitive contents of electronic medical records and its multi-user capabilities[3]. Ethical Practices refer to moral principles that govern a person's behavior in conducting an activity. It is the branch of knowledge that deals with moral principles. Ethics refers to the concepts of right and wrong conduct. Furthermore, ethics is basically a branch of philosophy dealing with the issue of morality. Moreover, ethics consist of the rules of behavior. It certainly defines how a person should behave in specific situations. With respect to healthcare management, the issue of confidentiality/privacy are the ethical problems associated with the adoption of technology in health care practices[3].

Confidentiality/privacy is the right of an individual to not have personally deniable information disclosed to others without that individual been expressly informed. In a health care delivery system, confidentiality of patient's records involves protecting patients' information from unauthorized individual, being concealed and secretive about patients' information and the act of ensuring that the patients' records are not given to non-clinical personnel including the patients

themselves[5]. Justices Warren and Brandeis define privacy as the right "to be let alone"[6]. It is "the right of individuals to keep information about themselves from being disclosed to others; the claim of individuals to be let alone, from surveillance or interference from other individuals, organizations or the government" [7]. The sensitive data that's shared as a result of a clinical/medical relationship is considered confidential necessitating that it must be secured [8]. The data can of different types and categories (including personal patient identifiable details, investigative requests and reports and therapeutic and outcome notes) and can be saved in different media (e.g., manual paper or digital/electronic records). Such sensitive data should be handled in a way that the patient's identity is protected and cannot be easily ascertained. For illustration, the sum of patients suffering from a particular cancer within a health facility are not inclusive this category. With regard to electronic medical records, when, privacy refers to the right patients have to control who can store, retrieve and share their health information. This means the patient's right to have control and keep his or her health information private. It also entails the circumstances in which a patient's protected health information may be used or disclosed. Right to privacy is a fundamental right recognized by the Nigerian Constitution.

Security alludes to the particular shields or controls that are put in put to guarantee the confidentiality/privacy of patient information. For example, security measures will incorporate a specialized defense mechanism that requires all people working within clinical care settings to log into a computerized platform (system) employing a unique account that has customized accreditations that are strictly personal not shared with others, in this way giving an instrument through which enforcement of the confidentiality/privacy of the data can be achieved as every user and their activities are personally verifiable. Security of both computerized and traditional paper-based clinical documentations is a basic string in healthcare texture. Security involves the

safety assurances of both manual and digital systems wherein patient medical data are stored. Violation or breach of privacy negatively affects patients, Health Information Officers and all other stakeholders. Security breach in the healthcare sector exposes providers to innumerable risk that can cause disruption of services, economic loss, reputational damage, reduced patient's confidence, and penalty under regulation.

The increment in computerization of patient medical records in the healthcare industry has exposed the sector to experience increased computer hacks and cyber-attacks. Protecting the security of data in health research is important because health research requires and involves the collection, storage, and use of large amounts of personally identifiable health information, much of which may be sensitive and potentially embarrassing. Privacy/confidentiality and security are basic rights in our society. Safeguarding those rights, with respect to an individual's personal health information, is an ethical and legal obligation for all health care providers. Doing so in today's health care environment is increasingly challenging. Every health care practitioner understands and respects the need for patient confidentiality/privacy. As professionals, the connection to the patients and colleagues depends on it. But, the truth is, advanced technology, new demands in health care, and developments in the world-at-large, make it more and more difficult to keep confidentiality[2]. Patients must be assured that the health information they share with health information management professionals will remain confidential. Without such assurance, patients may withhold critical information that could affect the quality and outcome of care[2].

In Nigerian health care facilities, ethical challenges associated with the use of IT have made the practice of confidentiality/privacy in the management of patient to become poor and this can be

traced to the fact that EMR which is a major component of ICT in a health care delivery system has somehow become porous and easily accessible by unauthorized personnel. Observation shows that some medical and health workers consciously and unconsciously release information about patients to non-medical personnel (for example. ICT support personnel) in the process of seeking for assistance from the ICT support staff. These usually occur when they are using the information system. Also, some of these ICT support staff who are not medically inclined abuse their privilege of having access to patient information by exposing these information to unauthorized persons.

Perceived usefulness is what causes people to accept or reject technology? Among the many variables that may influence system use, previous research suggests a determinant which is very important. People tend to use or not use an application to the extent they believe it will help them perform their job better. Hence the need to also focus on perceived usefulness of electronic medical records. Perceived usefulness is defined here as the degree to which a person believes that using a particular system would enhance his or her job performance. This follows from the definition of the word useful: "capable of being used advantageously. A system high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive user-performance relationship. Perceived usefulness as explained by Davis, is the personal conviction of individuals where they accept that utilizing technological advancements can positively enhance the execution of their work. In expansion to the assumed ease, based on the Technology Acceptance Model (TAM) presented by Davis, perceived usefulness is additionally the foremost predictor in users acknowledgment of a system. The perceived usefulness of the technological application is related to the efficiency and viability of the system and its cumulative advantages to enhance user accomplishments. Is it useful? This is the most important question for

technology. First and foremost, a technology or application should solve a problem, fill a need or offer something people find useful. In fact, people are willing to trade usability for a technology of great perceived value. It doesn't matter how easy it is to use a technology, it might not be so relevant if people don't find it useful. Usefulness is the holy-grail of everything, it's often even more important than ease of use. Perceived usefulness has been measured using five indicators. These indicators are timeliness, (quick or time saving), effort saving, improved quality and safety, cost reducing, and overall usefulness. These indicators will be adopted as measures of perceived usefulness in the study. Hence, the researcher finds it necessary to assess the ethical challenges in EMR (such as confidentiality/privacy and security) and the perceived usefulness of EMR in health care delivery system.

1.2 Statement of the Problem

Electronic medical records are digital version of a person's overall medical history including complaints, investigations, therapies and outcomes. EMRs have the sole purpose of ensuring and improving quality and safety of healthcare services. Previously, medical care were based on traditionally paper-based documentation of clinical data utilized for clinical, investigative or research and education, administrative and monetary purposes. It was extremely constrained in terms of multi-use, accessible to as it were one client at a time[9]. These shortcomings necessitated operational changes for better practice and birthed a technological approach which promises to increase access to health care, improve the quality of care and health, and decrease costs. In essence EMR usage promises to remedy the deficiencies of traditional paper based medical records practice. EMR usage is largely dependent on perception of its usefulness and adequacy in healthcare services delivery as it provides certain advantages like Timeliness, effort saving,

improved quality and safety, cost reducing, and overall usefulness in addition to its compatibility with medical ethical practices which seems to have confidentiality/privacy and security challenges in terms of patient data protection and management with the deployment of electronic medical records different from those encountered in traditional paper records settings. The employment of electronic medical records due to its perceived usefulness advantages seems to have negatively affected the confidentiality/privacy and security component of the ethics of medical practice[9].

The justification of EMR usefulness and adequacy as well as EMR compliance with medical ethical practices calls for an evaluation of the effects of ethical practices and perceived usefulness of EMR on the actual EMR usage. With the ongoing technological trend, health facilities are migrating or switching from traditional paper-based practice to EMR in other to retain relevance and practice within industry standards. In spite of the desired potentials of EMR usage, there are reservations regarding the effects of Perceived Usefulness of EMR and the Ethical Practices compliance on the total adoption. It must be noted that properly addressing Perceived Usefulness of EMR and the Ethical Practices compliance effects on EMR will strengthen and enhance beneficial adoption of EMR. Over the years, research conducted have largely advocated and elaborated on the benefits of implementing technology to all works of life, there is need to investigate how Perceived Usefulness of EMR and the Ethical Practices compliance associated with medical practice contribute to the actual adoption and usage of EMR in Nigeria, hence the need for this study which is aimed at examining the effect or influence of cPerceived Usefulness of EMR and the Ethical Practices compliance of EMR on its usage in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

1.3 Aim and Objectives of the Study

The study's broad aim is to investigate the impact of Ethical Practices and Perceived Usefulness on Usage of Electronic Medical Record by Health Information Management Professionals in Federal Hospitals in Lagos State, Nigeria. The specific objectives are stated as follows to:

i. determine the use of Electronic Medical Record (EMR) by Health Information Management Professionals in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

ii. identify the ethical issues (confidentiality/privacy and security) associated with the usage of Electronic Medical Record (EMR) by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

iii. identify the perceived usefulness and benefits of Electronic Medical Record (EMR) by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

iv. determine the influence of ethical practices (confidentiality/privacy and security) on usage of Electronic Medical Records by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

v. ascertain the influence of perceived usefulness of Electronic Medical Records (timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on usage of Electronic Medical Records by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

vi. examine the combined influence of ethical practices and perceived usefulness of Electronic Medical Records on the usage of Electronic Medical Records by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

1.4 Research Questions

1. What are the usages of Electronic Medical Record (EMR) by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos?

2. What are the ethical issues associated with Electronic Medical Record (EMR) usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos?

3. What are the perceived usefulness of Electronic Medical Record (EMR) among Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos?

1.5 Hypotheses

$H_0$1: There is no significant influence of ethical practices (confidentiality/privacy and security) on Electronic Medical Records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

$H_0$2: There is no significant influence of perceived usefulness of Electronic Medical Records (timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos

$H_0$3: There is no combined influence of ethics (confidentiality/privacy and security) and perceived usefulness Electronic Medical Records (timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos

1.6 Significance of the Study

The result of this study will be of importance to Healthcare Regulatory Bodies, Health Information Management Professional, Healthcare Stakeholders (Patients, 3rd Party Payers etc), Other Researchers and Global community. The study is designed to investigate and identify the different challenges in the usage of EMR as mediated by ethical practices and the perceived usefulness of the EMR software.

This research will highlight to the regulating bodies of healthcare in Nigeria, the areas of conflict of the singular and combined impact of ethical practices and perceived usefulness on EMR usage and proffer informed solutions in future regulations, legislature and laws to guide healthcare practice. The research will update Health Information Management Professional on peer experiences and practices, skill demands and approved best practices to enable the seamless navigation of the challenges in the utilization of EMR in healthcare practice, address consequences of breach of patient confidentiality/privacy, and recommend solutions to the security and confidentiality/privacy challenges of the migration and implementation of information technology in health facilities. This work will further educate patients and third party stakeholders on their responsibilities and corresponding expectations as regards EMR usage and modifying their negative perception and attitude towards Electronic Medical Record adoption and usage as it will make them see the potentials of its adoption and usage The study will validate the theory and conceptual model used and will contribute to the body of knowledge by serving as resource literature/material to intending researchers.

1.7 Scope of the Study

This study investigates Ethical Practices, Perceived Usefulness and Usage of Electronic Medical Records by Health Information Management Professional in National Orthopaedic Hospital Igbobi, Lagos State. The scope of this work will be limited to the aforementioned variables. The Dependent variable, Usage of Electronic Medical Records, will be measured by (frequency and purpose of use of electronic medical records). The independent variables Medical Ethical Practices which will be measured by (confidentiality/privacy and security) and Perceived Usefulness of Electronic Medical Records which will be measured by (timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness). This study will focus on

Health Information Management Professionals working in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos. These professionals are selected for this research because of paucity of government tertiary health facilities with consistently functioning Electronic Medical Records practice.

1.8 Limitation of the Study

The limitations encountered in this study are scarcity of funds, paucity of federal health facilities utilizing EMR, relatively few health information management professionals and a very bureaucratic research ethical clearance/approval practices at the facilities visited

1.9 Operational Definition of Terms

Electronic Medical Record is a digital collection of information about a person health that is stored on a computer. An electronic medical record includes information about a patient's health history, such as diagnoses, medicines, tests, allergies, immunizations, and treatment plans.

Electronic Medical Record Usage: This is the collective utility of electronic medical record application for the delivery of healthcare services by health information management professionals. It is the utilization of the sum total of the functionalities of the software in patient care, education and research, administration and planning among others by health information management professionals

Frequency of Use of EMR: The evidenced rate of utilization of electronic medical records in Healthcare practice by health information management professionals.

Purpose of Use of EMR: The evidenced reason for utilizing the facilities of electronic medical records. The justification and objectivity of intention to use electronic medical records by health information management professionals

Ethical Practices: refers to the standards that govern the conduct of a person, especially a member of a profession such as health information management professionals.

Confidentiality/Privacy: refers to "the right of individuals to keep information about themselves from being disclosed to others; the claim of individuals to be let alone, from surveillance or interference from other individuals, organizations or the government". Confidentiality/Privacy depicts the mechanisms a health information management professional utilizes to secure the patient's confidentiality rights, in relation to allowing and ensuring only certain authorized people get to a patient's record or controlling access as it were.

Security: Particular shields, strategies, measures, checks and balances that are incorporated by health information management professionals to guarantee security of patients medical data

Perceived Usefulness of Electronic Medical Record*:* defined as the degree to which a health information management professionals believes that using a particular system would enhance his or her job performance. Perceived usefulness of EMR is defined here as the degree to which it is believed that EMR is capable of being used by a health information management professionals advantageously.

Timeliness: The fact or quality of being done happening or occurring at a favourable, right, useful or best possible time. It is the favourable promptness of action by a health information management professionals.

Effort saving: Reduces or minimizes the amount of physical energy required by health information management professionals to facilitate the complexity of series of activities organized to achieve a goal

Improved quality and safety: The combined and continuous efforts to make healthcare delivery better thereby systematically eliminating or reducing waste and losses by health information management professionals

Cost reducing: The act of producing or providing services with minimal cost by health information management professionals. It is meeting all desired or expected specifications without compromising quality at competitive cost .

Overall usefulness: The characteristic, attribute or quality of having practical utilization worth or applicability to health information management professionals

Endnotes

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Chapter Two

Literature Review

This chapter attempts a critical review of the past relevant studies through the exposition of conceptual framework, theoretical foundations and empirical studies. This chapter will be presented under the following headings:

2.1 Conceptual Review

2.1.1 Concept of Electronic Medical Record

An Electronic Medical Record, more commonly called as EMR in the healthcare world, refers to the storage of a patient's information in a digital format[1]. These patient-centered records are available anytime for authorized users, thus easing the clinical workflow. The healthcare team has real-time access to the entire medical history of the patients including the diagnosis details, the treatment plans and aftercare, allergies to medications, lab test results, and more. Owing to the numerous benefits it offers, EMR has become an inevitable tool for hospitals as well as private health practitioners across the world. It fosters better health outcomes while reducing costs for both the healthcare provider and the patient. It negates medical error leading to improved diagnostics and patient safety. Moreover, it contributes to higher patient engagement and facilitates enhanced care coordination. In particular, the increased flow of electronic information raises a significant concern regarding the confidentiality/privacy of health information[2].

Patient records, once stored on singular paper documents in locked file cabinets, would instead be stored on multiple computer servers of remotely-connected organizations. This shift to electronic transmission of patient data creates an environment of healthcare data exchange that may be prone to security vulnerabilities as well as human error. Efforts were made to review related literature by different school of thoughts available. As aforementioned, it reviewed past works from textbooks, journals, internet and other materials which correlate with the topic of study[3].

Electronic Medical Records Software refers to any system that captures, stores, manages or transmits information related to the health of individuals or the activities of organizations that work within the health sector through electronic or computerized medium[1]. It also refers to the combination of vital and health statistical data from multiple sources, used to derive information about the health needs, health resources, use of health services, and outcomes of use by the people in a defined region or jurisdiction through a software or an electronic medium[4]. Electronic Medical Record is expected to collect data from the health sector and other relevant sectors, analyze the data and ensure their overall quality, relevance and timeliness, and converts data into information for health-related decision-making[5]. In addition to being essential for monitoring and evaluation, the information system also serves broader ends, providing an alert and early warning capability, supporting patient and health facility management, enabling planning, supporting and stimulating research, permitting health situation and trends analysis, supporting global reporting, and underpinning communication of health challenges to diverse users.

Although some Health Information Managers utilize the acronyms EHR and EMR as if they are exactly same (interchangeably), the composition and functionality they offer have enormous differences. An EMR (electronic medical record) is a computerized form of patient treatment documentation domiciled within a single facility and an EHR (electronic health record) is a computerized repository of health information beyond clinical practice. EHR is technological application that safely retains healthcare data from multiple collaborative networked facilities on external jointly owned servers which are accessed by internet through gadgets that have online or intranet association, though server-based EHR frameworks store information on either a individual server or in a information center[6].

Differentiating between EMR and EHR, EMR or electronic medical record contains everything you'd find in a paper chart, such as medical history, diagnoses, medications, immunization dates, and allergies. While EMRs work well within a practice, they're limited because they don't easily travel outside the practice. IC fact, the patient's medical record might even have to be printed out and mailed for another provider to see it. Meanwhile an EHR or electronic health record are computerized files of more than just medical data. It contains all the data you'd discover in a medical paper chart and much more[6]. An EHR may incorporate past therapeutic history, vital signs, therapy outcome notes, clinical assessments (diagnoses), drugs/medicines, immunization dates, sensitivities, investigative and imaging requests and reports. It also can contain other pertinent data, such as third-party payers (insurance) data, demographic information and indeed information imported from individual medical gadgets.

EHR is a system that permits interoperability and the safe dissemination of medical data. It promotes the expansion of the capabilities accessible to medical organizations in establishing more efficient methods of rendering services and also possibly introduce novel services to patients. The strength of an EHR lies not only within the information it contains, but also on the dissemination modalities – health data is made readily/immediately to authorized care-givers across healthcare facilities, thereby increasing the efficiency and effectiveness of coordinated patient care[6]. An electronic health record (EHR) is the methodical procedure of acquiring individual and group electronically saved health data in a digital format[6]. Such data are to be shared over a network of collaborating health facilities. Information is shared through network-linked, facility-wide data frameworks or other data systems and data sharing. EHR may incorporate information including socioeconomics, therapeutic history, pharmaceutical and

sensitivities, immunization status, investigative test results, radio-diagnostic imaging, vital signs, individual measurements including age and weight, and cost of care data[7].

For some considerable number of years now, electronic health records (EHRs) have been marketed as pivotal to enhancing the quality of healthcare services. Electronic health records are utilized for different reasons than just patientcare, nowadays, caregivers are utilizing information from patient records to promote and enhance quality results through their care administration programs. EHR collates all patients' socioeconomics (demographics) into a expansive pool, and employs this data to help with the creation and introduction of "new treatments or innovation in healthcare delivery" which overall improves the goals in healthcare[8].

Combining different sorts of clinical information from the system's health records has made a positive difference that assisted Health Information Managers recognize and categorize sick patients with long-term care needs. EHR can enhance outcome of care by utilizing the information and analytics to avoid hospitalizations in highly susceptible patients. EHR systems are configured to save information precisely and to capture the condition of an individual over time. It completely cancels the need to track down a patient's past paper therapeutic records and helps in guaranteeing information is current, precise and readable. It permits open communication between the patient and the care-giver, while maintaining "privacy and security"[9]. It can decrease hazard of information duplication as there is just one updateable record, which suggests the record is more likely current and diminishes hazard of misplaced lost paper documentation and is economical resource-wise. Due to the computerized data being searchable and in a single record, EMRs (electronic medical records) are more successful when mining medical information for the investigation of likely patterns and long-term variations in a patient. Public-based epidemiological studies on medical records can be

encouraged by the far-reaching adoption and implementation of EHRs and EMRs.[9] Healthcare regulations and processes continue to change. Tools that have been adopted and adapted throughout the evolution of healthcare technology include the EHR (electronic health record) and the EMR (electronic medical record). The EHR and EMR are complementary technologies, providing more benefit together than on their own. While many healthcare employees use the EHR and EMR daily, we seldom understand the rich history of the technological solution. The following is a brief historical overview of electronic medical records which is a digital repository that contains standard medical and clinical data gathered in a medical facility. The EMR began as an idea of recording patient information in electronic form, instead of on paper, in the late 1960's, Larry Weed presented the EMR concept to generate an electronic record to allow a third party to independently verify the diagnosis. Weed's vision focused on clinical data management. These systems were also known as hospital information systems[10].

The first EMR was developed in 1972 by the Regenstreif Institute and was welcomed as a major advancement in healthcare/medical practice[11]. Due to the high costs, this EMR wasn't as widely used as anticipated, and was primarily utilized by government hospitals. Into the 1990's, computers were becoming more affordable and became more common as the internet emerged and the Institute of Medicine projected that beyond the year 2000, every health facility would be computerized and fully utilize technology to improve patient care. Different countries and governments have since adopted and adapted this idea and engaged customized, sustainable and affordable versions globally to aid improved health care delivery through providing additional funding and incentives to Health Information Management Professional who adopt EMR systems. Medical Record is a single complete record, which documents the entire treatment plan

developed for, and medical services received by, the Member including inpatient, outpatient, referral services and emergency medical services whether provided by Network Providers or Out-of-network Providers.

Electronic health records are computer programs that health information management professionals employ to initiate/form, save, modify, and manage patients' health records electronically. These portray the essential component that encourages the much-wanted seamless interoperability of health data such that partners can consistently share important patient information. Electronic health record system is characterized as a record in electronic form that is hypothetically able to be disseminated over diverse healthcare settings. Data contained in electronic health record systems include patient demographics, outcome notes, vital signs, clinical histories, laboratory test results, diagnostic assessments, medicines, sensitivities, radio-diagnostic imaging, immunization information, regulatory and billing information. Data saved in electronic health record systems are utilized by wellbeing care providers, and in some cases patients, amid a patient's hospitalization, over time, and over care settings. EMR frameworks have gotten to be a very vital component that represents an essential tool for enhancing the safety and quality of modern healthcare delivery[12].

An electronic medical record (EMR) is a digital medical record that either originates from an electronic format or is converted from paper or hard copy to an online version. An EMR includes information about a specific patient, including: Patient contact information, including emergency contact(s), Vitals, such as height, weight, body mass index (BMI) and body temperature, Past and future medical facility appointments, Physician orders, Prescriptions, Medical progress and surgical notes, Consent to release information forms, Allergies, Past medical history, Billing information, such as insurance, Discharge summaries and treatment plans as well as therapy

outcomes.[13] An electronic medical record (EMR) is a digital version of the traditional paper-based medical record for an individual. The EMR represents medical records within a single facility, such as a hospital or a clinic[14]. EMRs are necessary in the dynamic and multidisciplinary healthcare practice to support data processing, informed decisive actions and documentation storage. Themes of EMRs were outlined summarily as: ((1) increased patient care service delivery in strict compliance to rules and standards (2) improved or upgraded capability to perform monitoring and surveillance for morbid conditions and healthcare delivery (3) decrease in rates of pharmaceutical mistakes (4) decrease utilization of care, and (5) blended impact on time utilization, three of which specifically related to quality whereas two address proficiency[15].

Partners within the healthcare industry consider clinical decision support and Computerized Provider Order Entry to be basic to changing the healthcare sector[16]. The utilization of technology such as EMRs in healthcare administration has provided an instrument for advancing more prominent reliability in healthcare quality[17]. There are proof of EMRs influence/effect on quality of healthcare [18-22]. EMRs have the ability to enhance the quality of healthcare services delivered. With EMRs the issue of unreadable penmanship accounts for an approximated 5 to 10 percent of therapeutic blunders, including misunderstood orders and prescriptions will cease to be an issue [21]. Research on assessment of safety of surgical procedures in connection to EMRs usage indicate a 7-26% improved safety change in seven out of eight safety metrics used within health facilities studied[23].

There is reported decrease in unfavorable drug reactions by 33% as a result of EMRs utilization. When health facilities get comprehensive and precise patient data, patients get enhanced quality care 24. EMRs have the ability to reduce pharmaceutical mistakes by giving enhanced access to needed fundamental information, superior communication and integration of care between distinctive care-givers and consultation sessions, and more proficient and observation and documentations [25.] The rate of unfavorable patient safety occasions in a study discovered that health care centers that had implemented a comprehensive EMR encountered 27% reduction in patient safety unfavorable events, 30% decrease in pharmaceutical mistakes and 25% decrease in surgery-related blunders [26]. A later study detailed that 94% of specialists show that EMR makes records promptly accessible at point of care, 88% detailed that EMR produces clinical benefits for their facilities whereas 75% indicated that EMR permits them to provide much better patient care service delivery [27].

EMRs are moreover valuable for reducing medication mistakes with the help of alarms and updates made available by the CDS system[28]. No ponder, nowadays a great number of healthcare offices the world over are embracing and utilizing EMRs with functionalities such as Clinical Decision Support (CDS), Computerized Physician Order Entry (CPOE)and Health Information Exchange (HIE) that have irrefutable possibilities to enhance quality of healthcare services delivery. Some nations have really gone past incentivizing the significant utilization of EMRs by experts and healthcare facilities to instituting punitive measures to curb non-compliance. On the other hand, a few schools of thought opine that computerization made a slight contrast in quality[29]. Additionally, other surveys discovered that EMRs utilization was not related with quality outpatient care [30].

They contend that simply adopting and utilizing EMRs is not solely adequate for the delivery of quality healthcare services, but that the application should be coupled with other frameworks such as clinical decision support, registry capacities and care delivery changes such as group or team-oriented approaches. A comparable study detailed that there is a decline in health information management professionals human empathy and sympathy considerations to patients amid clinical sessions due to electronic health records use[31]. The scholars further insist that medical care-givers some of the time tend to disregard or come up short to respond suitably to alerts from potential threat alarms due to the large volume of notifications they receive daily. This according to their research results in increased patient hazard. Electronic medical record (EMR) systems, defined as "an electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized Health Information Managers and staff within one health care organization, have the potential to provide substantial benefits to Health Information Managers, clinic practices, and health care organizations[32]. These systems can facilitate workflow and improve the quality of patient care and patient safety. Despite these benefits, widespread adoption of EMRs are low; a recent survey indicated that only 4 percent of health facilities reported having an extensive, fully functional electronic records system and 13 percent reported having a basic system[15].

EMR being the acronym for electronic medical record, which is a digital version of the paper medical record that has been used for years. The EMR replaces the older and bulkier record with a much more efficient and easily accessed records that is conveniently stored online or in the cloud. An EMR contains a great deal of information about each patient, and this information can be accessed by all providers within the healthcare team. It will contain the patient's medical and

surgical history, allergy information, treatment history, current, and past prescriptions, and other pertinent information that can be used in making future medical decisions [33]. EMR which are the digital equivalent of paper records at a health facility, contain general information such as treatment and medical history about a patient as it is collected by the individual medical facility[34].

An electronic medical record (EMR) is a digital version of all the information typically found in a healthcare facility: medical history, diagnoses, medications, immunization dates, allergies, lab results and doctor's notes. EMRs are online medical records of the standard medical and clinical data from one hospital, mostly used by providers for diagnosis and treatment. Comprehensive and accurate documentation of a patient's medical history, tests, diagnosis and treatment in EMRs ensures appropriate care within and outside the healthcare facility especially with referred cases. EMRs are more than just a replacement for paper records. They effectively allow communication and coordination among members of a healthcare team for optimal patient care. Its natural evolution began in the 1960s when we began to see "problem-oriented" medical records (like we understand them today) instead of just the diagnosis and treatment a Health Information Manager provided. This was the first time that third party facilities were able to independently verify the diagnosis. EMR systems provide a wide range of functionality and user interfaces, and become the hub of all clinical activity in the hospital. The EMR system is used daily for processing payment and insurance claims, scheduling patients appointment for consultations, sharing information with other staff within the clinic, adding new patients, as well as updating and recording patient information. EMR software systems also enable clinics to seamlessly integrate the regulatory and reimbursement changes of Meaningful Use attestation, ICD-10 and HIPAA 5010 requirements[35]. Electronic Medical Records (EMRs) are one of a range of digital health solutions that are key enablers of the data revolution transforming the

health sector. They offer a wide range of benefits to health professionals, patients, researchers and other key stakeholders. However, effective implementation has proved challenging[36]. The electronic medical record (EMR) is an enabling technology that allows physician practices to pursue more powerful quality improvement programs than is possible with paper-based records. However, achieving quality improvement through EMR use is neither low-cost nor easy but by seriously ensuring utilization [37]. Electronic Medical Record or "EMR" means the collection of health information relating to a Patient and stored in an electronic format.

Electronic Medical Record or "EMR" means an electronic system used to enter, maintain and store Patient clinical information, including such information as required under applicable state law and federal regulations, and maintained by a Healthcare facility. Electronic Medical Record means a digital record from which symptoms, conditions, diagnosis, treatments, prognosis, and the identity of the patient to which these things relate can be readily discerned and verified with reasonable certainty. Electronic Medical Record means an electronic record of health-related information concerning a person that can be created, gathered, managed, and consulted by authorized Health Information Managers and staff within a single health care organization. Electronic Medical Record means an electronic record of health−related information that includes patient demographic and clinical health information and has the capacity to provide clinical decision support; to support physician order entry; to capture and query information relevant to health care quality; and to exchange and integrate electronic health information with and from other sources [38]. Electronic Medical Record. (EMR) means the collection of health information relating to a patient of a health facility, electronically stored and managed by the hospital. EMR may also refer to the licensed system that contains a patient's medical information. Electronic Medical Record means a record of a person's medical treatment

created by a licensed health care provider and stored in an interoperable and accessible digital format; it is a computerized medical record used by the Institution that provides medical care to individuals. The US Department of Health and Human Services explains an electronic medical record (EMR) as a computerized form of a paper chart that has all of a patient's hospital treatment history from one health facility [39]. It additionally describes the main objectives of EMRs as utilizing computerized formats of records to track and observe patient information over time, recognizing patients who are due for care, and enhancing collective quality of patient care. EMRs apart from increasing the quality of patient care, also enhance significant proficiency savings for health facilities individually and the healthcare network collectively. A study 40 notes that the savings can be as a result of reduced hospitalization, managerial time of care teams, and the innovative utilization of medicine and radiology. It saves estimated enormous funds in billion per year for both ambulatory and inpatient care. Ultimately, EMRs improve the exactness and productivity of repayment components [41].

Challenges pointed out by some research in Nigeria on health data and healthcare quality include poor quality of data, incomplete data, inconsistencies in data reporting and untimely data submission[42,43,44]. One of the factors fueling this problem is the dependance on manual method of data capture. As regards to this, the need for a useful well driven computerized health information administration has been clamored to fortify the healthcare system[45]. Meeting the challenges of data needs for the Healthcare industry is often daunting due to inadequate human resources, substandard infrastructure, lacking financing component, insufficient political will and poor ICT knowledge and skill for health documenting. In organizations where EHR was grasped, there was the deployment was partial so full potentials could not be achieved[46, 47].

There's a noteworthy potential for EMR to provide cost-effective, quality health care, and investing on EMR frameworks by governments and healthcare systems is expanding around the world. In any case, there remains a pressure between the utilization of EMR in this way and implementation. Moreover, the expansive body of audits within the e-health execution field, regularly based on one specific technological innovation, setting or medical condition make it hard to arrive at a complete and understandable summary of accessible proof to assist adoption and implementation [48.] Innovation is utilized broadly to administer health care around the world [49, 50]. e-Health (the application of data, computer or communication innovation to certain aspects of health or health care) is seen as fundamental for tackling issues confronting healthcare frameworks of expanding request, due to an ageing populace, better medications, and constrainedresources[51].

However, in spite of the fact that there's broad assertion about the significance and potential benefits of EMR, realization of these benefits has often been slower than expected, mostly due to challenges with implementation [52]. For example, a health service survey stated the need to make better use of available health technologies and acknowledges that health facilities previously failed to make best use of these because of difficulties in understanding how best to adopt and implement them [53]. Implementation failures continue to be reported, leading to reduced performance, demoralized staff and wasted scarce resources [54]. This points out the solid need for those undertaking the usage of EMR to be knowledgeable in variables that impact execution and be well prepared to plan techniques and interventions to enhance the far-reaching compelling usage of e-health and deal with challenges to implementation. One issue with the current EMR usage manual is that it is divided over numerous subspecialty areas [55]. With numerous surveys on the execution of diverse innovations available, it may be hard for Health Information

Managers, managers or policymakers to find and apply an adequate body of proof for their particular circumstances

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Usage of EMR refers to the healthcare delivery need satisfying power of EMR. It is a quality possessed by EMR service to satisfy healthcare needs. Characteristics of Usage entails being subjective, relative and useful. Utility and Usefulness from the perspective that anything having utility does not mean that it is also useful. If a service possesses want satisfying power, it has utility. But the consumption of that service may have benefits and risks thereby being both 'useful' or 'harmful'. Thus utility is not usefulness. Usefulness is a subjective and psychological concept. It means utility of a commodity differs from person to person. Services are useful to those who accustomed to it, but it has no utility or usefulness for those who do not need it, utility of different commodities differs from person to person. Therefore, utility is subjective. Usefulness is a relative concept. A commodity may possess different utility at different times or at different places or for different persons[56].

Endeavors are being made to assess EMR utilization, to survey the degree to which the use of particular capacities inside the EMR was being measured, and to evaluate how utilization information that is collected is regularly utilized. Endeavors to monitor EMR utilization changed colossally from hospital to hospital, relying partly on the availability and accessibility of IT assets, organizational size and presence of canned reports inside the EMR framework and size of facility. Generally, smaller clinics don't collect or survey utilization information. Most of the time, the review logs are a source of data to evaluate which healthcare worker accessed distinctive or particular feature of the EHR. This was to a great extent done to guarantee the security of patient records.

Many different Electronic Medical Records Software exist. Each provides various functions tailored to specific and unique needs, but all Electronic Medical Records Software should include basic functions namely Security Control which is a feature is crucial to control access to information. An EMR software should have a mechanism to safeguard documents that are exempt from disclosure and allow access to those records which should be made publicly available, Addition, Designation, and Version Control that ensures the Electronic Medical Records Software allows users to add documents to the system and designate a document as an original record. It should also automatically assign the correct version designation, Metadata Capture and Use that facilitates the user to capture and use the appropriate metadata according to an a health facility's needs[52] With the known significance of EMRs, effective execution is basic so that the application can achieve its full potential. Be that as it may, "there is a strong learning curve with the EMR, and most hospitals have their own system which usually requires some kind of intensive indoctrination in the form of mandatory instruction" [56].

EMRs are for the most part not simple to actualize both technically and organizationally since EMRs need to gather information from "laboratory systems, pharmacy frameworks, and doctor correspondence systems which dwell on numerous non-connected ICT islands with varying structures, varying levels of granularity, and diverse code systems[57]. For example, errors and irregularity of EMR information have been famous on genetic phenotype and intracranial pressure (ICP) monitoring, and those information quality challenges alone have major impact on therapeutic care delivery[58, 59]. Later studies moreover note the need for well-coordinated organizational planning, care-giver training, and training support by IT staff [60]. In this sense, their execution takes after that of enterprise resource planning (ERP) systems that

are broadly utilized by numerous firms and non-profit organizations to cover non-medical managerial functions like human assets, book-keeping and productions. Similar to ERP systems, EMR frameworks can offer operational, managerial/regulatory and organizational benefits to different partners [61,62]. Every Electronic Medical Records Software must be equipped with records management capabilities. Software with a records management component are sometimes referred to as an Electronic Document and Records Management Systems (EDRMS). An Electronic Medical Records Software may provide storage within the software or the ability to work with an adjunct storage system. An Electronic Medical Records Software should allow users to search every word in an entire document while other systems only provide metadata searching capabilities. Automatic Conversion capability to afford the user the ability to execute automatic conversion of a document from one file format to another (e.g. from a Word document to a PDF) after the file has been designated as a record[52].

Nigeria is witnessing continuing advocacy and increase in number of individuals yearning for computerization of health information and healthcare processes. However, little is known or sought about the opinions of the diverse healthcare providers who would ensure the successful implementation and meaningful use of health information technology in the country [63]. Challenges associated with the implementation of EMRs in Hospitals in Nigeria include infrastructure issues like power supply and inadequate ICT equipment; human factors issues like inadequate computer skill among non-medical and non-clinical staff; as well as political issues such as poor administration, corruption and financial constraints. While the participants believed that willingness of the Health Information Officers to adopt the EMR system and good knowledge of computer use among the Health Information Managers were prospects to

implementing the EMR, the participants agreed that benefits such as improved access to and enhanced confidentiality and safety of patient data as well as enhanced service delivery will be derived from implementing the EMR at the hospitals where they work [64]. These potentials of EMR are laudable but the opinions and perspectives of the Health Information Management Professional who would drive both implementation and meaningful use of EMR are integral parts to a successful deployment and usage The metrics adapted for usage of electronic medical records are purpose of use and frequency of use of EMR[65,66]. The usage of electronic medical records is greatly reflected in its purpose and frequency of use.

The purpose of use of EMR systems are to automate the clinical operations of Healthcare providers and ultimately improve quality, safety and efficiency [67, 68, 69]. They empower computerized storage of patient data including charts, with hospitals for following patient demographics, clinical histories, drugs, test outcomes and other sorts of patient-specific clinical data, as well as the costs attached to the services rendered. It can precisely capture the condition of the patient at distinctive stages and encourage access to the complete patient history within a moment. The framework normally entails a single modifiable record that is always updated as actions are documented on it and this subsequently, decreases the possibility of information replication. It encourages productive extraction of therapeutic data for examination and clinical audit and eliminates the logistical challenges related with paper-based medical records. EMR systems have essentially become a regular feature of the healthcare industry in developed nations, and their adoption in numerous developing nations is on the increase since they help promote qualitative healthcare. They also create a platform for an assortment or array of computer program applications that offer advantages to patients and HCPs. A complete EMR

application may incorporate clinical and pharmaceutical regulatory features with decision-support for healthcare professionals and administration. EMRs additionally encourage increased proficiency, advancements within the exactness of clinical records, drug store stock administration and bookkeeping [70, 71, 72, 73, 74, 75].The potential abilities of electronic medical record systems is that an efficient EMR application would be adequately versatile for accommodating fitting computer program applications which can help the facility in its activities and empower it to be able to address numerous of the operational challenges. An EMR application can incorporate pertinent monetary bookkeeping program bundles, including those with features for observing money related exercises within the application program. These incorporate particularly created applications for checking transactions and mitigating the chance of asset misappropriation. These might incorporate arrangements for audit trailing to monitor transactions exercises within the organization and minimize the dangers of fraud and untrue claims. Within the region of enhancement of quality of care, It is a standard necessity of EMR programs to encourage access to patient hospital records by endorsed healthcare staff [76, 77, 78, 79, 80].

Such applications can additionally encourage data sharing between the different authorized users, which can be amplified to different care settings, including all endorsed internal and external Stakeholders.[81] Suitable computerized decision support systems with highlights for enhancing clinical decision-making can be included. These incorporate giving timely access to patient's current medications, therapies and interventions amid treatments to avoid adverse drug–drug interactions and to facilitate compliance with standards of best practice. The system

canmoreover accommodate suitabledisease management tools, including health facilities for publ ic health advancement. With respect to Operational administration, The EMR application can be as valuable as it is planned to serve, inside the limits of current electronic technology. For illustration, it can contain an appropriate project portfolio administration instrument which can encourage centralized administration of the processes included [82, 83]. The tool can be utilized to track asset levels, screen utilization of services and oversee staff-related requests such as workload, stock levels, estimate required human need levels and truancy [84]. There are commercial program bundleswith reasonable interfacing for consolidation, and access to such information can be confined to properly assigned staff by the usage of a secured (password based) facility [85]. An EMR application with an stock checking arrangement can enable all partners to function inside commonly concurred terms, on the least standard of delivery required of the services by the way of performance targets, which each stakeholder can screen autonomously. The hospital can also utilize the EMR application to plan standard working methods and train their personnel on such methods for successful adoption and maybe, also incorporate arrangements for incentivizing usage compliance and combating non-compliance[85].

Functionalities for timely identification and addressing of challenges can also be consolidated into the application to guarantee smooth running and maintenance of the EMR application itself. Such a tracking and auditing system can also encourage assessment of beneficial service delivery levels by all stakeholders and not only for care-givers and regulators, recognize the challenges and start necessary actions for improvement. A strong EMR application can be configured to incorporate bio-metric readers like fingerprint recognizable component. Such an

arrangement can encourage validation of bona fide enrollees at service delivery points and additionally serve as a means of increasing the credibility of authentication for the statutory authorization process. Without a doubt, a template for electronic photograph recognition tool can be added. It is basic that service providers are paid timely, to empower them to oversee their cash flows viably and be able to continue to provide their services uninterruptedly. Platforms which work on paper-based records and paper-based charging frameworks are related with connected to bills riddled with a variety of expenditures , most of which are avoidable with electronic billing[86, 87]. Computerized billing moreover offers advantages such as timely processing and payments. For example, the normal turnaround time for claims ranges from a few weeks to months within the NHIS paper-based billing platform, which can be significantly reduced under an efficient electronic billingsystem[88]. From practice experience and literature, the advantages from EMR systems significantly exceed the costs related with its selection and usage[89, 90, 91, 92]. The computerized billing system can encourage an proficient transmission of claims to the assigned clearing house for handling by the push of a button – guaranteeing that the claims are delivered on a precise and timely basis, quick validations are gotten and real-time status checks can be conducted with timely information on the stage of each claim being prepared. EMR is a major clinical and administrative tool but require funds to initiate and sustain it[92].

With the unfaltering increment in the adoption of electronic medical records (EMR) over the past decade, EMR usefulness has advanced from fundamental to more nuanced usefulness including computerized provider order entry, investigative result administration and decision support. As EMR gets to be progressively commonplace and institutions and health care

providers ended up progressively acclimated in utilizing and customizing tools to document clinical experiences, there's a developing new capacity to save discrete clinical information components that can later be mined for clinical data. Particularly, the efficient utilization of EMR information will be for nonstop improvement and research purposes to improve quality, safety, results, bills and effectiveness of care, while lessening wastage, mistakes and duplication. The pace of progresses in clinical knowledge continues to accelerate and healthcare providers are challenged with acclimatizing modern information while retaining what has previously been learned. Within the health callings, quality of care (QoC) is most basic from both a human and a trade viewpoint. The total costs attached to poor quality, waste, delay, and redundancy in care, as well as preventable unfavorable health events are great. Health Information Manager utilization and efficiency measurements have centered on outcome (e.g. number of patients seen per hour), procedural aptitudes (e.g. central venous catheter insertion) and other clinical care measures (e.g. correct antimicrobial medications for respiratory tract conditions)[92].

When connected to systematic review and feedback that delivers timely concise input, these last mentioned measurements can be utilized to advance more noteworthy adherence with proof-based practices Healthcare workers who more regularly utilized the quality metric guides were more likely to prescribe medications and procedures in compliance with industry stndards. Information communication technologies (ICTs) are currently being used in developed and developing countries to improve access, effectiveness, and efficiency of health care[92, 93]. The electronic medical record system (EMR) as one of the supportive systems has great potential to address the main challenges of healthcare systems[94]. Incorporating EMRs into the healthcare

system is not all about modernizing the health system, but is about saving lives by facilitating communication and practicing evidence-based decision-making[95]. Even though the EMR is an essential tool for the healthcare sector, the adoption and utilization of EMRs remains low in developing countries[96].

While some studies generally report positive improvements in care with EHR use, [97, 98] others are mixed, [98, 99] and some show negative effects on quality of care[30, 100 101, 102, 103]. There are indications that when more mature, or advanced EMR use exists, including, for example, better integration with workflow, increased positive effects may be realized[101, 104]. Therefore, it is important to be able to assess EMR use effectively, so that the link between use and outcomes can be further explored. There are signs of significant inputs underway to evaluate the purpose of usage of various EMR features and abilities at granular levels. For hospitals that are monitoring EMR usage, one of the common indicators being observed was the quantity or frequency of electronic lab requests that were ordered using the EMR application and the quantity of lab results/outcomes that were obtained electronically. Additionally, Individual hospitals have created different levels of monitoring to evaluate how rapidly lab results were viewed by care-givers once they are accessible within the EMR and how expeditiously clinical notes were endorsed with signatures once completed[105]. Other capabilities that were monitored included quantity of electronic notes were made and validated by signing, and the volume of prescriptions were requested utilizing the e-Prescribing feature of the EMR. Some hospitals reported that they additionally monitored different other clinical decisions support capacities within the setting of how many Smart Forms were being utilized, quantity of medication alarms were fired, and care-giver reactions to these cautions. Many hospitals

reported that the EMR permits for health information management professionals to set their customized limit for cautions and updates inside the limits of the facility's settings. These facilities reported monitoring how limits were being adjusted by care-givers at the various location[106].

Some hospitals implemented very robust capability to assess utilization of EMR functions at the level of use of specific tools and daily procedures. At hospital level, usage monitored features such as the number of patient visits, drugs viewed, sum and sorts of bills generated, seeing and requesting of laboratory services, referrals and the utilization of structured charts by the health workers. For lawful reasons, Health Information Managers were required to "lock" all clinical notes by digitally signing them. Utilization appraisal monitored the number of notes left unsigned for each care-giver at each service point. The health facility also endeavored to see if there were any patterns of clinical decision support overriding or suppressions within the system and followed both the recurrence and seriousness of drug and hypersensitivity alarms. EMR utilization appraisal inspected whether care-givers accessed the e-Prescribing feature and at what rate. At the healthcare professional level, usage assessment was on the use of the system by Health Information Managers, the use of radiological and laboratory interface, and examined the proportions of failure and success[107]. In common, for health facilities that were presently measuring EMR utilization, there was a noteworthy level of granularity in terms of the sort of information collected. All clinics reported that they are able to track utilization both at the facility and at the healthcare professional level and survey the utility of particular functions. Utilization information was less demanding to get to especially

around fundamental features such as the usage of formats, completing insurance data, and monitoring the capacities inside the EMR system which had been inactivated. However, observing Health Information Manager usage of more advanced functionalities (e.g., CDS) was specifically challenging. Healthcare institutions have to closely work with their clinical staff to identify the measures of interest and decide how this data could be displayed in a way that would be most valuable to the hospital[108].

Health facilities reported a number of distinctive issues related to capturing and analyzing utilization information which included not having any standards or rules for choosing what they ought to track to evaluate utilization, what were the ideal measurements to utilize and any standard detailing templates[109]. It was moreover noted that once the measurements had been chosen, a reasonable quantity of effort was needed to get a clean set of utilization information so that it might more viably be utilized for reporting. Additionally, some of the facility systems found that having a high volume of data accessible did not essentially mean a comparable level of valuable data may be abstracted. Rather, it was likely to introduce complications or obstruct the method of analyzing the results. health facilities had to adjust the need for getting point by point reports with putting preference on monitoring things that were either attainable or viable. Most EMR programs anticipate that hospitals would desire to measure detailed usage data hence these features are not in-built. As a result, a noticeable amount of uniqueness was required to current reporting capability to facilitate granular levels of utilization information. In some instances, hospitals that had in-house mastery attempted the configuration and customizations that were essentially necessary whereas in other cases the organization worked closely with their service provider to construct

custom reports. Numerous hospitals reported that information was being collected and put away within the EMR framework but getting to this data in a significant way demanded notable effort. Given that a critical level of experience was required with the vendor application as well as with regard to creating and producing custom reports, numerous facilities noted that this would not be an exercise that smaller hospitals would be able to embrace and sustain on their own. In most cases, concentrating on EMR usage was at the center stage of focus and evaluating usage of the different functionalities within the EMR was mostly only started after the major adoption issues had been sorted out and the hospitals had migrated into the EMR maintenance mode EMR[110].

Components within an EMR include: patient registration, appointment scheduling, patient encounters documentation, prescriptions, document management, labs/imaging Investigative requests and reports, Billing, clinical decision support, interoffice communications among others[12]. It is thus important to develop a comprehensive, multidimensional set of measures for evaluating EMR use. Multifunctional EMR use is defined as "Uses of electronic medical records and at least two electronic functions in each of the following four domains: generating patient information, generating panel information, order entry management, and routine clinical decision support[111]. It is expected that assessments of use should take into account more than just the use of multiple EMR functions. Therefore, multidimensional assessments of electronic medical record (EMR) use could go beyond these traditional measures to include, taking into account the way that the EMR is used during patient encounters, exploring the way that different Health Information Managers use the EMR, understanding how the EMR is being used by a team of practitioners versus an individual, and evaluating degrees of function use[111]. Investigating standard for IT use by both people who use IT often and those who do not, asserted that people

who use IT often have a higher standard of IT use[112]. Furthermore, surveys are commonly based on the assumption that the frequency of technology use can be estimated. This is usually measured as the reported frequency of use, for example, from "No time", "1–30 minutes per day" to more than 6 hour per day" [56]. However, such a scale is prone to fail when measuring infrequent but intensive phases of technology use; moreover, it does not account for the quality of time spent with the technology. Other studies have shown that frequency of use of information system varies between daily, weekly, monthly and occasionally[56]. Current approaches to assessing the degree to which Health Information Managers use their EMRs in day-to-day practice focus primarily on the use/nonuse of component parts of the EMR—i.e., functions of the EMR such as ordering laboratory tests. Therefore, unidimensional (for example, asking if the EMR is used yes or no), and binary measures of EMR use (for example, those that simply ask if an EMR function is used – yes or no) may be inadequate to evaluate actual use; positive outcomes associated with EMRs may be better gauged when multiple dimensions of EMR use are taken into account**.** In as much as there are tremendous merits attached to the usage of EMR, it must be subjected to the guiding ethics of medical practice to facilitate desired outcomes as power without control is often hazardous. As such the mediation of medical ethical practices are discussed next.

2.1.2 Concept of Ethical Practices

The term medical ethics first dates back to 1803, when English author and physician Thomas Percival published a document describing the requirements and expectations of medical professionals within medical facilities. The Code of Ethics was then adapted in 1847, relying heavily on Percival's words[113]. Over the years in 1903, 1912, and 1947, revisions have been made to the original document[113]. The practice of Medical Ethics is widely accepted and

practiced throughout the world[114]. Medical ethics describes the moral principles by which a healthcare provider must conduct themselves. Medical or Healthcare ethics are simply a set of moral rules, principles, beliefs and values that guide healthcare providers in making choices about medical care. Central to healthcare ethics is our sense of right and wrong and our beliefs about rights we possess and duties we owe others. Ethics of healthcare ensures care givers make choices that are right, good, fair and just[114].

Ethical practices is being in compliance or accordance with widely held norms of behavior, or of written standards of conduct adopted by the members of a profession. Its is the accepted principles of right and wrong of an organization or profession. Ethics is the branch of philosophy that deals with the distinction between right and wrong, with the moral consequences of human actions. The study of fundamental principles which define values and determine moral duties and obligations. It is the branch of philosophy dealing with values pertaining to human conduct, considering the rightness and wrongness of actions and the goodness or badness of the motives and ends of such actions. It is the systematic rules or principles governing right conduct. Each practitioner, upon entering a profession is saddled with the responsibility to adhere to the standards of ethical practice and conduct set by the profession[115]. It is the aspect of philosophy that bargains with the qualification between right and wrong, with the morality consequences of human activities.[116]. It is the study of fundamental principles which define values and determine moral duties and obligations. Moral codes of practice concerned with: behavior [117]. Ethics is a branch of philosophy that examines rights and wrongs, what should or ought to be done. Dictionary of medical ethics described clinical ethics as "the obligations of moral nature which govern the practice of medicine" [118]. Clinical morals pertain to application of the science

and understanding of morality within the medical and health sciences field. The objective of medical morals is to increase the safety and quality of medical care. Morals are central to medical practice for two reasons: firstly, morality contemplations cannot be dodged when health information management professional and patients must select what need to be done from among the numerous things that can be done for a patient in a specific clinical circumstance, and, secondly, the concept of premium clinical practice infers that both technical and moral contemplations are taken into account[119-121]. The most seasoned (more than 2500 a long time ancient) therapeutic code is Hippocratic Corpus, also known as the Hippocratic oath, which incorporates several components that emphasize the commitment to patients well-being[122].

Religion, social development, and patient and healthcare professional conduct have all had an impact on the medical ethics that have evolved through the years. The human rights movement has also recently had an impact on medical ethics. The human rights movement's basic tenet is that patients should have the autonomy to make their own informed decisions. Human rights are a major social force that significantly and favorably affect medical ethics and health care[123]. Clinical ethics is based on the idea that practicing medicine is a moral endeavor. People who are ill urge health information management professionals to assist them in getting better, and these professionals claim to be morally and technically qualified to do so. The process of healthcare professional-patient accommodation, in which a decision is made jointly that a patient places his or her care in the hands of the healthcare professional and the healthcare professional acknowledges his or her ability to care for the patient, reveals this moral framework[124,125].

The medical community today adheres to a number of ethical standards. These include independence, goodness, loyalty, justice, and utility. Respect for a person's right to self-determination is referred to as autonomy and refers to a patient's preferences for their medical care. Being beneficent implies helping sufferers. Faithfulness to a healthcare professional's obligations and duties is emphasized by the word "fidelity." Justice requires that a healthcare provider decide on a patient's care in a fair and impartial manner. The idea of utility suggests that healthcare professionals' efforts should produce positive outcomes, maximizing patient benefits while minimizing resource waste[126, 127]. The foremost objective of clinical morals is to improve the quality of patient care in terms of both the method and result of care. The need for clinical morals rests within the truth that any genuine choice making includes 2 components—a specialized choice requiring the application of information of essential and clinical sciences to the patient's present issues, and a moral component demanding that the technically appropriate choice is additionally ethically faultless. The technical component tells us what can be done, the ethical component, what have to be done for the patient. The blending of the technical and ethical measures in clinical choices focuses on shared or combined choice making; that is, bordering on making choices with, as well as for, the patient[127].

New ethical questions are currently emerging in a variety of fields, including the quickly developing fields of palliative care, reproductive biology, gene therapy, genetic engineering, etc. Clinical ethics' future course will be influenced by sociocultural pressures, the medical technological revolution, the expanding idea of patient autonomy, and the litigious culture of the day. Goals, priority setting, public education about patients' rights and responsibilities, the

development and maturation of the professional discipline, resource allocation for health policy planning, finances, and human resources, and concepts of biomedical ethics to prevent ethical conflicts, confusion, and misunderstanding between patients and Health Information Management Professional and remodeling of the healthcare professional-patient relationships with a gradual shift from traditional paternalism to a patient-centered model are all areas in which clinical ethics will play a significant role in the future. This review provides an overview of ethics and clinical ethics. The four fundamental clinical ethical principles that this book will emphasize—beneficence, non-malfeasance, autonomy, and justice—are defined and discussed.. Confidentiality/privacy is a common denominator of all the components of clinical ethical practices aforementioned. It is the main clinical ethics issue as regards EMR and will be the focus and metric employed to measure ethical practices in this work

The notion of autonomy gives rise to the principles of informed consent, stating the truth, and secrecy, each of which is examined. There are usually ethical dilemmas in patient care circumstances, particularly between beneficence and autonomy. Making judgments about patient care in various circumstances is a key duty of a practicing health information manager. These choices entail more than just picking the best course of action. but in providing evidential backing (health data)[128]. Since the healthcare professional has an ethical duty to (i)benefit the patient, (ii) avoid or limit harm, and (iii) respect the patient's views and choices, ethics is a fundamental and integral component of clinical medicine [128]. Can health information management professionals develop their ethical abilities to better fulfill this duty to uphold the law? The study of the origins of morality and the particular moral decisions that must be made falls under the broad umbrella of ethics. Normative ethics aims to provide an answer to the query,

"Which general moral norms for the guidance and evaluation of conduct should we accept, and why?" [129].

Since they cut across cultures, geographies, faiths, and other group identities, certain moral standards for proper conduct are shared by all human beings and make up common morality (e.g., not to kill, or harm, or cause suffering to others, not to steal, not to punish the innocent, to be truthful, to obey the law, to nurture the young and dependent, to help the suffering, and rescue those in danger). The term "particular morality" refers to rules that apply to certain groups based on their culture, religion, or line of work and include obligations, values, standards of conduct, and other things. A relevant illustration of specific morality is the healthcare professional's "accepted role" to provide competent and trustworthy service to their patients. To reduce the vagueness of "accepted role," healthcare professional Local, state, and national organizations have defined their norms. It should be acknowledged, nonetheless, that following these rules may not always uphold moral standards as the codes have stated. "often appeared to protect the profession's interests more than to offer a broad and impartial moral viewpoint or to address issues of importance to patients and society" [130].

As a result of numerous heinous mistreatments of human subjects in research, medical interventions without informed consent, and experimentation in concentration camps during World War II, as well as positive developments in medicine and medical technology and societal changes, bioethics quickly expanded from being primarily concerned with professional conduct and codes to its current status with a broad scope that includes research ethics, public health ethics, organizational ethics, and clinical ethics. The four pillars of ethics are beneficence, non-maleficence, autonomy, and justice, which together make up the fundamental principles of ethics.

The first two date back to Hippocrates' "to help and do no harm" maxim, whereas the final two developed later.. Thus, the patient's best interest is emphasized as a goal in Percival's book on ethics from the early 1800s, but autonomy and justice are not included. However, justice and autonomy came to be recognized as significant ethical ideals over time. The Principles of Biomedical Ethics by Beauchamp and Childress is a modern classic because it explains these 4 principles and how to put them into practice while also outlining other alternatives[129].

A number of moral principles are supported by the principle of beneficence, which requires medical professionals to act in the patient's best interests. These principles include protecting and defending others' rights, preventing harm, removing conditions that will cause harm, assisting those who are disabled, and saving those who are in danger. It is important to emphasize that the language used here is one of positive conditions rather than non-maleficence. The guiding principle mandates that patients' welfare and benefits be prioritized over merely preventing harm.. While Health Information Management Professional' beneficence conforms to moral rules, and is altruistic, it is also true that in many instances it can be considered a payback for the debt to society for education (often subsidized by governments), ranks and privileges, and to the patients themselves (learning and research). Non-maleficence is the obligation of a healthcare professional not to harm the patient. This simply stated principle supports several moral rules – do not kill, do not cause pain or suffering, do not incapacitate, do not cause offense, and do not deprive others of the goods of life. The practical application of non-maleficence is for the healthcare professional to weigh the benefits against burdens of all interventions and treatments, to eschew those that are inappropriately burdensome, and to choose the best course of action for the patient. This is particularly important and pertinent in difficult end-of-life care decisions on

withholding and withdrawing life-sustaining treatment, medically administered nutrition and hydration, and in pain and other symptom control. A healthcare professional's obligation and intention to relieve the alleviation of a patient's pain through the use of appropriate medications, such as opioids, outweighs any anticipated but unintended negative effects or results (doctrine of double effect)[131,132].

The philosophical basis for autonomy, as understood by philosophers[10] and acknowledged as an ethical norm, is that all people should have the ability to make moral decisions and rational decisions, and each should be given the opportunity to use their capacity for self-determination [133]. Justice Cardozo reinforced this moral precept in a court ruling in 1914 with the epigrammatic dictum., "Every human being of adult years and sound mind has a right to determine what shall be done with his own body" [134]. Autonomy must be balanced against conflicting moral values, as is true for all four of the principles, and in some cases may be overruled. An apparent example would be if a patient's autonomous activity results in harm to another person (s). The idea of autonomy does not apply to people who lack the ability (competence) to act on their own, such as newborns and children and those whose incapacity is caused by a physical, mental, or developmental illness. Governments and healthcare organizations both have policies and procedures for evaluating ineptitude. However, a strict distinction between incompetence (determined by a court of law) and incapacity to make health care decisions (assessed by medical professionals) is not useful in practice because a Health Information Manager's determination of a patient's lack of decision-making capacity based on a physical or mental disorder has the same practical implications as a court's finding of incompetence. [135]. Detractors of the autonomy principle challenge the emphasis on the individual and suggest a more expansive idea of

relational autonomy (shaped by social relationships and complex determinants such as gender, ethnicity and culture)[136]. Even in a developed western nation like the United States, whose culture is heterogeneous and attitudes on the necessity for full disclosure and decisions regarding life support differ from those of the majority white population, some minority cultures have distinct beliefs (preferring a family-centered approach) [137].

In non-Western societies, resistance to the concept of patient autonomy and its offshoots (informed consent, confidentiality, and truth-telling) is not surprising. Health Information Management Professionals' use of paternalism in cultures with deep-rooted beliefs and traditions primarily results from beneficence. Culture, which is made up of a group's traditional values, social structures, and physical characteristics, is not static or independent; rather, it evolves over time in tandem with other developments. Assuming that the patterns and responsibilities in healthcare professional-patient relationships that have been in place for more than 50 years still apply is presumptuous. Therefore, a critical analysis of paternalistic medical practice is required due to factors such as economic and technological advancement, increased socioeconomic and educational levels among the population, globalization, and a shift in society toward emphasizing the patient as an individual rather than a member of a group. Research that incorporates well-structured questionnaires on demographics, patient preferences for informed consent, honesty, and role in decision-making can accomplish this necessary analysis. In order to ensure informed consent and honesty, the concept of autonomy requires that healthcare professionals provide patients with the medical information and treatment options they need to exercise their right to self-determination., and confidentiality[138]. The patient or subject I must be competent to understand and decide, (ii) must receive a full disclosure, (iii) must comprehend the disclosure,

(iv) must act voluntarily, and (v) must consent to the proposed action in order to provide informed consent for a medical or surgical procedure, or for research. The global application of these requirements, which are based on and evolved in western culture, has encountered considerable opposition, and it has been suggested that another set of requirements be created to take into account cultural norms from other nations [139]. There must be a core of human rights that we would desire to see honored globally, despite variances in their superficial elements, Angell wrote in reaction and in vehement defense of the five prerequisites of informed consent. local custom's influences[140]. Since competence is the primary prerequisite for informed consent, it is important to be able to spot incompetence.

The generally accepted criteria for finding incompetence are based on the patient's incapacity to express a preference or choice, their inability to comprehend their circumstances and their ramifications, and their inability to reason through a significant life decision. Patients who were once autonomous but are now incompetent should nevertheless be allowed to communicate their prior choices (or prior autonomous judgments)[142]. Patients who are incompetent (non-autonomous) and patients who were once competent (autonomous) but are now incompetent need a substitute decision-maker.. The surrogate may adopt either a substituted judgment standard (i.e., what the patient would want in this situation rather than what the surrogate would want) or a best interests criterion when dealing with a non-autonomous patient (i.e., what would bring the highest net benefit to the patient by weighing risks and benefits). In his scholarly paper, Schweikart offered a beneficial and practical solution for situations in which the surrogate is unsure of the patient's preference(s) or in which the patient's preferences have not kept up with

scientific developments. They advise the surrogate to base the choice on the patient's real values and interests, or what they call "substituted interests" [143].

Health Information Management Professional are obligated not to disclose confidential information given by a patient to another party without the patient's authorization. An obvious exception (with implied patient authorization) is the sharing of necessary medical information for the care of the patient from the primary healthcare professional to consultants and other health-care teams. In the present-day modern hospitals with multiple points of tests and consultants, and the use of electronic medical records, there has been an erosion of confidentiality. However, individual Health Information Management Professional must practice restraint in refraining from sharing patient-specifics with family members, in social situations, or on social media[144]. Patient confidentiality has some notable exceptions. Among these are the legal obligations to report sexually transmitted illnesses, gunshot wounds, and any unusual circumstances that could seriously damage another person (e.g., epidemics of infectious diseases, partner notification in HIV disease, relative notification of certain genetic risks, etc.).

Justice is typically understood as the fair, equitable, and suitable treatment of individuals. Distributive justice is the type of justice that has the most bearing on clinical ethics. The fair, equitable, and adequate distribution of health care resources is referred to as distributive justice, and it is decided by justifiable rules that establish the conditions of social cooperation. [145]. There are different valid principles of distributive justice. These are distribution to each person (i) an equal share, (ii) according to need, (iii) according to effort, (iv) according to contribution, (v) according to merit, and (vi) according to free-market exchanges. Each principle is not exclusive,

and can be, and are often combined in application. It is easy to see the difficulty in choosing, balancing, and refining these principles to form a coherent and workable solution to distribute medical resources.

A few examples on issues of distributive justice encountered in hospitals include allocating time for outpatient visits (equal time for each patient?), care for uninsured patients, and allocating scarce resources (equipment, tests, drugs, organ transplants). based on social and/or economic standing, depending on complexity or necessity). Health Information Management Professional must accept the necessity of justice included in this principle, notwithstanding how challenging it may be and despite the many limitations that exist[146]. In situations where there are conflicts of interest, the patient's fairness comes first. When a specific course of treatment is preferred over others or a pricey medication is chosen over a therapy that is similarly effective but less expensive because it benefits the healthcare provider in some way—financially or otherwise—this concept is flagrantly violated.

Each of the four ethical principles is to be regarded as having a prima facie responsibility that must be met, unless there is a specific situation in which it clashes with another principle. When such a conflict arises, the healthcare professional must assess the relative weights of the conflicting prima facie obligations based on both content and context in order to identify the actual obligation to the patient. A patient in shock treated with immediate fluid resuscitation and the insertion of an indwelling intravenous catheter caused pain and swelling as an illustration of a conflict that is amenable to settlement. Here, the beneficence principle prevails over the non-maleficence principle. However, a lot of the disputes that health information management professionals deal with are far more intricate and challenging. Think about a competent patient

who declines a potentially life-saving procedure (such as starting mechanical ventilation) or requests a procedure that could result in their death (e.g., withdrawing mechanical ventilation). Conflict between the concepts of beneficence and autonomy is one of the most prominent in the field of ethical decision-making.

In the traditional practice of medicine, beneficence has always played a significant role. Giving it priority over patient autonomy, however, it amounts to paternalism and equates the relationship between a patient and a healthcare provider to that of a parent to a child. In accordance with their perception of what is best for the child, a father or mother may reject a child's preferences and exert influence over them in a number of ways, including nondisclosure, manipulation, deception, and coercion. Paternalism can also be split into soft and hard forms. When a patient lacks or severely lacks autonomy, soft paternalism occurs, the healthcare provider acts out of beneficence (and occasionally out of non-malfeasance) (e.g., cognitive dysfunction due to severe illness, depression, or drug addiction)[147]. Due to the difficulties in detecting whether the patient was non-autonomous at the time of decision-making, soft paternalism is problematic, but it is ethically acceptable as long as the action is consistent with what the healthcare professional thinks the patient's values to be. Hard paternalism is when a healthcare provider takes action that is meant to help a patient but goes against the will of an autonomous patient who is fully educated and competent and is morally wrong. Consumerism, a rare and extreme form of patient autonomy that holds the belief that the role of the healthcare professional is limited to providing all the medical information and the options for interventions and treatments while the fully informed patient makes a choice, is on the other end of the spectrum from hard paternalism. The role of the healthcare practitioner is confined in this paradigm, which prevents them from using all of their

knowledge and abilities to serve the patient. This model is also morally repugnant because it amounts to patient desertion. Pellegrino and Thomasma contend that beneficence can be reconciled with respect for autonomy in the face of the opposing paradigms of these two concepts. “the best interests of the patients are intimately linked with their preferences” from which “are derived our primary duties to them” [148].

Their differing perspectives on treatment goals are one of the fundamental and frequently occurring causes of dispute between healthcare professionals and patients on treatment-related issues. Health information managers must communicate with patients in plain language, without the use of medical jargon, and with the intention of defining the goal(s) of treatment under the altered circumstances as goals change over the course of disease (e.g., a chronic neurologic condition gets so bad that a ventilator is required, or a cancer becomes resistant to treatment). The healthcare provider should be aware of patient issues, such as worry, fear, pain, a lack of faith in them, as well as other beliefs and values that can make it difficult for them to make an appropriate decision[149]. The theoretical debate of ethical principles that has just been had is applicable in real-world therapeutic settings. This approach to problem-solving in ethics is realistic and includes: Clinical evaluation is one example of how ethical concepts are used to patient care (identifying medical problems, treatment options, goals of care). Patient 2. (finding and clarifying patient preferences on treatment options and goals of care). 3. Quality of life (QoL), which examines how medical issues, interventions, and therapies affect patients' QoL while taking into account personal prejudices about what is considered an acceptable QoL. 4. Setting (many factors that include family, cultural, spiritual, religious, economic and legal).

After considering clinical ethical practices and its influence as a mediator/regulator of EMR usage, this work focuses primarily on the confidentiality/privacy and security aspect embedded in the principle of autonomy as its area of concentration on clinical ethical practices. Confidentiality/Privacy as a sub-variable of ethical practices in medicine can not be discussed in isolation to privacy and security hence the inclusions of the latter. Having itemized the area of focus, it is necessary to have an assessment of EMRs perceived usefulness which will directly alongside ethical practices impact EMR usage[149]. Medical ethics generally fall under three major concepts which govern the situation, actions and outcomes of actions. In as much as medical ethics are all about morality in conduct of Health Information Management Professional in ensuring the entrenched principles of autonomy, beneficence, non-maleficence and justice are maintained, there are circumstances that present conflicting complexities. In ensuring that the principles of autonomy, beneficence, non-maleficence and justice are upheld during such situations, certain concepts were developed to regulate and justify actions and consequences or outcomes of such actions to avoid chaos. These three concepts are Consequentialism, Utilitarianism and Deontology[150].

Consequentialism is an ethical ideology that states the morality of an action is dependent purely on its consequences. A simpler way to phrase this would be that the "ends justify the means". If your action has an overall benefit, then it does not matter about the action itself. It supports actions that result in positive outcomes even if temporal or untrue[150] Utilitarianism says the best action is that one that brings about the best benefit. It focuses on the wider society, considering plurality and not just the wellbeing of the singular patient in question. It's a form of consequentialism. Utilitarian ethics dictates that treating more patients with the available

resources is morally superior to treating a single patient as a greater overall benefit is achieved[150]. Deontology is duty-based ethics. This ideology states that the correct course of action is dependent on what your duties and obligations are. It implies that the morality of an action is based on following the rules, rather than the consequence of following them. This is in direct contrast with consequentialism. It is a concept of ethics that demand that it is said as it is without any ambiguity or recourse to consequences of such action as long as established guidelines are maintained[150]. Traditionally, medical professionals have a duty to maintain the privacy of a patient's personal health information, unless the patient expressly gives consent to disclosure or there is another recognized legal justification. This stems from the Hippocratic Oath, which requires healthcare professionals to maintain patient confidentiality.

The law recognizes confidentiality as a privileged mode of communication between a caregiver and a care recipient in a professional relationship and as one of the cornerstones of medical practice. Protecting a patient's private information is not only an issue of moral decency; it is also crucial to maintaining the strong relationship of trust between the patient and the doctor. [150] Confidentiality safeguards information that is gathered in the context of an intimate relationship. It addresses the issue of how to keep information exchanged in that relationship from being disclosed to third parties. Confidentiality, for example, prevents physicians from disclosing information shared with them by a patient in the course of a physician–patient relationship. Unauthorized or inadvertent disclosures of data gained as part of an intimate relationship are breaches of confidentiality The key to preserving confidentiality is making sure that only authorized individuals have access to information. The process of controlling access—limiting who can see what—begins with authorizing users. In a physician practice, for example, the

practice administrator identifies the users, determines what level of information is needed, and assigns usernames and passwords. Basic standards for passwords include requiring that they be changed at set intervals, setting a minimum number of characters, and prohibiting the reuse of passwords. Many organizations and physician practices take a two-tier biometric approach to authentication, adding a biometrics identifier scan, such as palm, finger, retina, or face recognition. The user's access is based on pre-established, role-based privileges. In a physician practice, the nurse and the receptionist, for example, have very different tasks and responsibilities; therefore, they do not have access to the same information. Hence, designating user privileges is a critical aspect of medical record security: all users have access to the information they need to fulfill their roles and responsibilities, and they must know that they are accountable for use or misuse of the information they view and change[151].

Confidentiality/Privacy in the context of healthcare, privacy refers to the patient's right to control and maintain the secrecy of his or her health information. It also covers the conditions under which protected health information about a patient may be used or shared. A fundamental right protected by the Nigerian Constitution is the right to privacy[152]. Justices Warren and Brandeis defined privacy as the right "to be let alone" [153, 154]. It is "the right of individuals to keep information about themselves from being disclosed to others ; the claim of individuals to be let alone, from surveillance or interference from other individuals, organizations or the government" [155, 156]. A clinical connection results in the sharing of information, which is regarded as confidential and needs to be kept private [157]. The data may include identity information, diagnoses, treatment and progress notes, and laboratory findings. It may also be kept in a variety of formats (e.g., paper, video, electronic files). This category does not include data that cannot be

used to determine the patient's name, such as the quantity of men with prostate cancer treated at a particular facility[158]. With regard to Health Information Technology, When we discuss patient control over who can store, retrieve, and share their health information, we are referring to the concept of privacy. The term "confidentiality" refers to the procedures a provider uses to protect the patient's right to privacy, such as limiting who has access to a patient's records. Only with the patient's consent or as permitted by law should patient information be disclosed to third parties. This does not imply, however, that doctors cannot access patient data. Without the patient's consent, information may be disclosed for administrative, financial, or therapeutic objectives. The patient also has legal, federal, and state-granted rights to see his or her health record, get a copy of it, and make changes to it.

The issue of confidentiality/privacy of health information cannot be overlooked as it also constitutes a standard for health information documentation. A particular health information system cannot be considered to be of good quality if there is no medium to ensure the confidentiality of the data contained in it. This therefore means that privacy and confidentiality of data in a health information system promotes its quality[152]. Privacy and confidentiality of a particular health information system involves the process of ensuring that unauthorized persons does not have access to the information contained in it or the information is not disclosed to an unauthorized person only in exceptional cases. This can be attained by using a database system or software with password or any other form of protection to restrict unwanted access to information/data contained therein. It is impossible to talk about privacy/confidentiality without addressing security which is the collection of technical approaches that address issues covering physical, electronic and procedural protection for sensitive information collected. Security include identification of potential threats to systems and data, and the protection of data from

inadvertent or malicious inappropriate disclosure as well as handling matters about the non-availability of data due to system failure and user errors. Security can be defined as the procedural and technical measures required to prevent unauthorized access, modification, use, and dissemination of data stored or processed in a computer system, to prevent any deliberate denial of service, and to protect the system in its entirety from physical harm. Security helps keep health records safe from unauthorized use. When someone hacks into a computer system, there is a breach of security (and also potentially, a breach of confidentiality). No security measure, however, can prevent invasion of privacy by those who have authority to access the record. Security describes the particular precautions or procedures put in place to guarantee the privacy of patient data.

For instance, a technical protection for security might mandate that everyone working in a healthcare environment sign in with separate accounts and passwords that are not shared with anyone else, creating a way to maintain the confidentiality of the data. A crucial thread in the fabric of healthcare is the security of both paper and electronic health records. Protection of the physical and digital infrastructure holding health records is a component of security, Health Information Officers, and all other stakeholders are impacted by a security breach. Security breach in the healthcare sector exposes providers to innumerable risk that can cause disruption of services, economic loss, reputational damage, reduced patient's confidence, and penalty under regulation. The healthcare industry is experiencing an upsurge in cyberattacks as a result of growing record digitization. Protecting the security of data in health research is important because health research requires the collection, storage, and use of large amounts of personally identifiable health information, much of which may be sensitive and potentially embarrassing [159].

There is Government reports of medical equipment cybersecurity vulnerabilities have increased by 525 percent[151]. The estimated cost of a healthcare data breach to an organization worldwide, shockingly skyrocketed in the last decade[160]. The rise of EMRs, increased use of mobile devices like smartphones, medical identity theft, and the eagerly anticipated data exchange between and among organizations, Health Information Managers, federal agencies, and patients are all contributing factors to the growing concern over the security of health information. Patients may not be honest with the doctor if their trust has been damaged.. Records in the office must be safeguarded if the patient is to have confidence in the Health Information Manager. The security procedures required to safeguard patient information and practice data must be known to medical staff. According to a recent survey, 73% of healthcare employees text each other about their jobs. A fundamental challenge is how to make the data shared in these exchanges secure.

There is no mechanism to regulate what data is communicated, how much information is transmitted, if communications are being eavesdropped on, what photographs are exchanged, or whether the mobile device is encrypted or safe. Mobile devices were not created for centralized control by an information technology (IT) department because they are primarily meant for individual use[161]. Mobile gadgets can be readily lost, broken, or stolen, whereas computer workstations are rarely taken. It is critical to encrypt data sent over mobile devices that contain sensitive information. Data manipulation, destruction, and hacking are additional potential threats, so all users must be included in security measures and ongoing training programs. Firewalls, antivirus software, and intrusion detection software are a few security techniques that safeguard data integrity. Regardless of the type of security mechanism employed, a complete security program and an operational audit trail system are required to ensure the data's

integrity[161]. When establishing electronic medical records systems, certain HIPAA-specific security precautions must be followed. Administrative safeguards, physical safeguards, and technical safeguards are the three categories into which the HIPAA Security Rule divides its security requirements[159]. The administrative procedures used to guarantee that security standards are met are known as administrative safeguards. These include assigning accountability for security management, adopting rules and procedures, and providing workers with privacy and security training.. Administrative safeguards are defined as, “administrative actions, policies and procedures, to manage the development, selection, implementation, and maintenance of security measures to protect electronic sensitive health information and to manage the conduct of the hospitals workforce in relation to the protection of that information.” The majority of the HIPAA security requirements are comprised of the safeguards listed in this category. [159].

Health care businesses must develop policies and procedures to "prevent, detect, contain, and correct security violations" in accordance with the first standard, Security Management Process. Risk assessment, risk management, and a penalty policy are all components of an efficient security management process. If a healthcare facility doesn't first properly examine what its dangers are, they won't be able to decide what protections they should put in place. For instance, it wouldn't make sense to use a fantastic new pricey technology to block access to a system that might not actually contain any sensitive data. After thoroughly assessing your risks and the best way to manage them, make sure the chosen safeguards are correctly put into place and adhered to. There should be explicit sanction policies to erring staff who do not follow the facility’s risk management plan to deal with these violations. Finally, you must actively analyze system activity, such as audit logs, access reports, network activity logs, and security incident reports, in

order to find these infractions and to spot attempts to get around security controls. The next measure of protection is to confirm that a company has appointed someone to be in charge of the security of all systems that include electronic health records. Although it may seem simple and superfluous to add this as a formal requirement, there is frequently finger-pointing inside an organization when a security problem involving electronic health records is discovered. Role definitions made up front make it clear who is ultimately in charge of security and stop accusation in the case of a negative security incident. Despite the fact that someone must ultimately be in charge of the organization's security plan, this does not preclude the person from assigning particular security responsibilities to others[151].

Workforce Security and Information Access Management, the third and fourth administrative safeguards, require that an organization have policies and procedures in place that specify who is allowed access to electronic health records and who is not, as well as how to grant permissions. These policies and procedures should also specify not only who should have access, but also how that access is determined as well as who has the authority to determine it. For instance, access might be determined by a thorough job description.. There should be policies in place in a hospital to cope with personnel turnover (or other type of changing roles of staff or contractors). This will guarantee that access to electronic health records is discontinued when it is no longer necessary for a person to have it[152]. In other words, rather than being a "all or nothing" access, it is role-based. For instance, a secretarial role that schedules patient appointments is unlikely to require access to a patient's list of problems or diagnoses, especially for delicate subjects like mental health concerns or an HIV diagnosis. A health care institution is required to "Implement a security awareness and training program for all members of its workforce (including

management)" in accordance with the fifth administrative safeguard, security awareness and training. The facility's staff must cooperate with several security measures in order for them to be effective in ensuring the safety of systems that include electronic health records[156]. As a relatively typical security measure, the use of authentication controls (otherwise known as usernames and passwords) enables a system to uniquely identify users and to limit access based on that user's function. If users disclose their passwords to other users, this safety measure is entirely undermined. The training must make it crystal obvious why specific security precautions must be observed, how to do so, and what the consequences are if they are not. Security awareness can also be achieved through log-in monitoring, such as reporting unsuccessful log-in attempts to the user, and password management, such as guidelines on how to update passwords and prohibitions against sharing passwords.

Health facilities are required to have policies and processes in place to deal with security issues under the sixth administrative standard, Security Incident Procedures. An unauthorized attempt to access, use, disclose, change, or delete information in an information system or to obstruct the normal operation of such a system constitutes a security event, whether the attempt is successful or not. The organization must have policies in place to respond appropriately to and report any such instances when they occur[157]. All enterprises should have a contingency plan in place to be proactive in preparing for situations that could prevent access to electronic PHI, like power outages, natural catastrophes, system malfunctions, or any other disruption of crucial business processes. The contingency plan ought to have policies and processes for data backup, disaster recovery (i.e., how to bring systems and data back online following a breakdown), and plans for emergency operation (i.e., how to carry on operations when systems are down). To make sure

that they will function if anything awful does occur, these procedures should be routinely checked. In order to prioritize the level of backup, disaster recovery, and emergency operation for each of the systems, it is crucial to thoroughly assess how crucial each system is.

As regards Physical Safeguards, HIPAA Security Rule requires that health facility's have physical safeguards and controls in place to protect electronic medical records. These safeguards provide a set of rules and guidelines that focus solely on the physical access to electronic medical records. These are the safeguards put in place to guard against hazards like natural disasters and unlawful infiltration and to safeguard electronic systems, hardware, and the data stored there. These could consist of door locks, unique rooms, and backups to guarantee that the data can be retrieved. According to the Security Rule, physical safeguards are, "physical measures, policies, and procedures to protect a covered entity's electronic information systems and related buildings and equipment, from natural and environmental hazards, and unauthorized intrusion." Each organization's physical safeguards may be different, and should be derived based on the results of the HIPAA risk analysis. (HIPAA Resources, Physical Controls, Physical Safeguards 2021)[159].

There are four standards included in the physical safeguards. These include: i. Facility Access Controls, ii. Workstation Use, iii. Workstation Security and iv. Device and Media Controls

Facility Access Controls are policies and procedures should limit physical access to all electronic medical records to that which is only necessary and authorized. Some common controls include things like locked doors, signs labelling restricted areas, surveillance cameras, onsite security guards, and alarms. Personnel controls could include ID badges and visitor badges. Workstation use covers appropriate use of workstations, such as desktops or laptops. These policies and procedures should specify the proper functions that should be performed on workstations, how

they should be performed, who is authorized and physical workstation security. Workstation security is necessary to restrict access to unauthorized users. Device and media controls are policies and procedures that govern how hardware and electronic media that contains electronic medical records enters or exits the facility. These controls must include disposal, media reuse, accountability, and data backup and storage[157]. Technical safeguards are the automated measures employed to secure and manage access to electronic health records. Examples include implementing encryption standards for data held in health information technology systems and exchanged across them, as well as authentication mechanisms to confirm the identity of a person accessing a system containing electronic health records.

While no healthcare company can ensure that there won't ever be a data breach, taking the required technical precautions can significantly reduce the likelihood of a security incident. Healthcare businesses must make sure that the technical safeguards they have in place are up to date and thorough as technology itself continues to develop. Electronic protected health information (also known as electronic medical records) for patients must be protected from all external and internal risks. Facilities should be aware of all HIPAA technical safeguards requirements even if recent data indicates that the majority of health data breaches occur due to lost equipment.[156]. According to the HIPAA Security Rule, technical safeguards are "the technology and the policy and procedures for its use that protect electronic medical records and control access to it." Essentially, a health facility must use any security measures that allow it to reasonably and appropriately implement the necessary standards for protection. Moreover, a covered entity must determine which security measures and specific technologies are reasonable and appropriate. Healthcare facilities must establish a balance between the identifiable risks and

vulnerabilities to electronic medical records, the cost of various protective measures and the size, complexity, and capabilities of the organization[157]. Strong technical safeguards include a variety of different components, including access and audit control. In order to ensure that system activity can be linked to a specific user, a facility must ascertain the access control capability of all information systems that contain electronic medical records. It is crucial to establish a defined access control policy that will direct the creation of procedures. It will also be advantageous to implement a system for encrypting and decrypting electronic medical records. This can assist healthcare companies in determining whether the chosen encryption is suitable for maintaining electronic medical records both during storage and transmission. The encryption method adopted must be affordable, practical, and effective. For proper use of their newly acquired skill set, health information management experts must receive training in all facets of the chosen encryption option[159]. Facilities must install hardware, software, and/or procedural mechanisms that record and review activities in information systems that contain or use electronic medical records in order to comply with audit control standards. A healthcare facility must also disclose and document its audit control techniques and procedures. All employees must be aware of the frequency of audits, the methods used to evaluate the findings, the organization's procedures for punishing employees who violate those policies, and the location of audit information[151].

A healthcare institution will be significantly more prepared for all forms of data breaches if technology precautions are appropriately implemented along with physical and administrative safeguards, according to Comprehensive HIPAA Safeguards. Data encryption and firewalls are only the beginning; staff members also need to have the appropriate training and be aware of the best practices for handling electronic medical information. All things considered, healthcare companies must make sure that a person viewing electronic medical records is genuinely

permitted to do so. Even ensuring that access privileges to patient data are valid can help to create robust technical safeguards. To guarantee that electronic medical records are adequately protected, the Evaluation standard underlines the significance of routinely evaluating the organization's security approach[156]. Providers and organizations are required to formally name a security officer to work with a group of health IT specialists who can inventory the system's users and technologies, identify security flaws and threats, assign a risk or likelihood of security concerns in the organization, and address those concerns. An employee of the institution may be tasked with maintaining privacy and security, or these duties may be outsourced. Apart from ethical considerations and concerns attached to the use of EMR, it is important to ascertain the usefulness of the software as it relates to meeting the expectations and demands of medical practice to justify EMR usability in Healthcare[161].

2.1.3 Concept of Perceived Usefulness of Electronic Medical Record

Davis defines perceived usefulness as the prospective user's subjective probability that using a specific application system will enhance his or her job or life performance[65]. Users' subjective perceptions of a technology's perceived utility determine whether they think it will help them accomplish their jobs more effectively. There would be five statement items used to measure this variable, namely, fast (or quick), time saving, effort saving, cost reducing, and overall usefulness[162]. Perceived utility is the main element in user acceptability of a system, according to Davis' Technology Acceptance Model (TAM) model. The efficiency, efficacy, and overall advantages of the system in terms of enhancing user performance are all factors that influence how useful people consider it to be. The fundamental tenet of the TAM is that people's use of technology is mediated by their acceptance of it, which is in turn influenced by two cognitive

criteria, perceived utility (PU) and perceived ease of use (PEOU) [163]. In other words, it refers to how much a person thinks utilizing technology would enhance the quality of their work.

Therefore, users are more likely to want to adopt a technology the more valuable it is. Perceived Usefulness (PU) as one of the independent constructs in the Technology Acceptance Model (TAM) is "the extent or degree to which a person believes that using a particular information system would enhance his/her productivity or job performance[65]. Perceived Usefulness directly influences both attitude toward systems use and behavioral intention to use the system. Perceived Usefulness is being a crucial variable of EMR usage, it is influenced by perceived ease of use. It is the level of individual conviction that utilization of a particular information technology system would enhance his or her job performance. A system high in perceived usefulness is one that a user believes has a positive usage to performance relationship[65]. According to some theories, technological innovation can improve employee performance, which therefore improves corporate performance as a whole. Beyond expanding accessibility and availability of healthcare services, the healthcare industry needs technological innovation to prioritize patient safety[164]. According to Davis (1989), the perceived usability and usefulness of technology revealed in the Technology Acceptance model can be used to further explain technological advancement.

However, everyone in an organization has a view of how simple and helpful adopting technological improvements is[165]. People must undergo psychological adjustment, technical perception development, and behavioral control awareness in order to successfully adapt to technology. An individual's view of how technologies, or a specific technology, are designed to enhance their duties or roles in terms of efficiency and effectiveness is known as perceived usefulness. Individuals, however, differ and have various ways in which they respond to change.

Not everyone feels comfortable switching from the way things have always been done to a new approach. However, there will inevitably be a decline in employee performance[166] when firms fail to effectively communicate or illustrate how the chosen technology enhances effectiveness and efficiency in accordance with their job functions. Therefore, in order to improve employee performance, firms must promote the adoption of innovative procedures and products by effectively explaining their advantages[166].

The subjective possibility that the technology will increase an individual's or team's performance from an organizational perspective is known as perceived usefulness[167]. The perceived usefulness[65] of a technology is determined by the operators' individual perception of whether using that technology would boost performance. The perceived utility of a technology refers to the extent to which a person thinks that the employed technology may eventually serve as the only component in achieving their aims. A notion known as "perceived usefulness" demonstrates how changing people's behavior might be a particular aspect of prolonged usage on several occasions[168]. Both intrinsic and extrinsic motivations are appropriate notions that drive people's use of technology. The extrinsic motivation appears as a kind of passion that derives from the user's conviction that technology may be used to improve particular results obtained from particular activities. Five different size indicators—advanced productivity, beneficial for the individual, efficacy, quicker transactions, and effectiveness of an activity—are used to measure or evaluate perceived utility variables[169]. The perceived relevance of EMR products and services to stakeholders' roles or duties has a significant impact on their adoption beliefs, particularly when these products are accessible and reasonably priced [170].

Organizations must therefore create tactics that convey to their target market how valuable a product or procedure is. However, studies have shown that people are more inclined to adopt new technology when they learn about it or are convinced that it would improve their performance[171]. The technology acceptance model is aware of the important factors affecting an innovation's acceptability[172]. Simply put, technology adoption is the acceptance of a given information technology and information system by a person[65]. The sole construct of perceived usefulness, which highlights the significance and individual capacities of people to use computer base applications in a way that the person achieves utility at a maximum point to effectively carry out their work or role, is a key component of the Technology Acceptance model. Applying the concept of perceived usefulness in the EMR software, usefulness is how the effectiveness of the EMR application is meeting the needs of Healthcare delivery stakeholders. Perceived Usefulness and Attitude towards Perceived usefulness being a condition in which an individual believes that using a technology system can help improve the individual's performance and work performance.

Perceived usefulness could be understood as people's judgment on whether their decision to use or implement a specific technology is advantageous for themselves [173, 174, 175]. Furthermore, Ozturk, defined Perceived Usefulness as people's intention of using a new technology in which people put a strong sense of belief that the new technology will improve their job performance[176]. Another author defined perceived usefulness as consumers or people's judgment in which they believe that the technologies that they're about to adopt will improve the quality of their job or activities. The decision to accept an information system is influenced by the degree of "trust." In general, "trust" of its usefulness. Further, it has a direct and positive influence on the intent to

use. Perceived usefulness can be defined as the degree of confidence a person has that using an information system will improve their performance. In other words, if someone believes that an information system is useful, they will use it, otherwise they will not[177, 178].

Perceived information system (IS) usefulness is a good predictor of extended usage and exploratory usage. However, surprisingly IS usefulness was found to explain a much larger variance in exploratory usage. Information quality and system integration were found to influence IS usefulness. However, information quality also has a direct affect on extended usage, while system integration directly influenced exploratory usage. The 'usefulness' indicator is a fundamental driver of usage intentions affecting the anticipated effectiveness of EMR. Perceived Usefulness indicator has been used extensively in information systems and technology research and refers to "the extent to which a person believes that using a particular technology will enhance her/his job performance" It was argued that EMR system delivery process is directly related to the usefulness of the service yielding a component of value for healthcare services. Perceived usefulness is a variable that determines the usefulness of the functions presented by EMR[177].

Perceived usefulness becomes the determiners of a system, adoption, and behavior of the users. A technology can be said to be successful if it has the value of usefulness needed by the service provider and consumer. System users will use it if the system is useful; whether the system is easy to use or not easy to use. Perceived usefulness is how far someone believes that using a particular system will improve its performance. Perceived usefulness has a dominant influence on EMR utilization decision. It also has a positive influence toward attitude and intention to utilize EMR. The indicators to measure the variable of perceived usefulness are as follows: work

more quickly, job performance, increase productivity, effectiveness, make job easier, and useful. Since usage has been shown to be a critical element of any information system success including EMR, great attention is given to the factors that positively influence end-users to utilize Information Technology (IT) platforms. Perceived usefulness is identified as the principal determinant of system utilization[178].

A technology or an information system provides value to its users. Technology Acceptance Model (TAM) successfully operationalized such value as the degree to which a system can improve users' job performance. The proposed construct, perceived usefulness, has been proved to be the most important factor for technology adoption. However, many scholars have called for further theoretical development to enrich this critical construct but not much effort has been put forward [179]. EMR as a Health information system is transforming healthcare organizations by playing a supportive role in improving efficiency and quality of healthcare. At the moment, healthcare is progressively being influenced by technology, and the utilization of EMRs represents a new dawn of technological possibilities. As more advanced systems to manage patient healthcare data become available, there is a rising supposition that these will result in accomplishments for Health Information Management Professional, patients and all stakeholders. These aftereffects are therefore expected to improve the efficiency and effectiveness of healthcare services.

Perceived usefulness is described as an important factor of intention, in which it persuades the users to accept a more advanced and user-friendly technology. With that, if the perceived usefulness of EMR platforms are greater, the more effective is the intention towards its usage[180].

Perceptions of the usefulness of EMR are significant predictors of Health Information Management Professional intention to use the applications in service delivery. Perceived usefulness is viewed as the degree to which Health Information Management Professional believe that using technologies will improve Healthcare delivery. Several studies acknowledge that perceived usefulness is a determining factor of the adoption, integration and continued usage of technologies in hospital activities[181]. Basically, EMR technologies used in healthcare facilities provide stakeholders with opportunities to collaborate in knowledge creation and sharing. In this regards, elements of collaboration, communication and participation in healthcare delivery are essential factors for the adoption and integration of EMR[182]. Perceived usefulness is the degree to which an individual believes that a particular system would enhance his or her job performance[65]. Information system researchers have investigated TAM, and asserted that PU positively influences individual's acceptance of various systems [183].

Previous studies discovered that PU positively affected the users' behavioral intention to use systems[183]**.** A completely functional EMR system has more features than only the fundamental ones, like clinical notes and documentation. It includes more of the provision of an elite platform for medical practice processes. With a fully effective EMR, healthcare is smoothly integrated with other members of the healthcare community, aiding in the improvement of care coordination, patient engagement in care, patient care quality, increase in efficiency and cost savings for healthcare services[65]. Other perceived benefits comprise: A digital patient record (EMR) system, as opposed to paper records, can offer information management tools to assist physicians in providing better treatment by more effectively arranging their medical procedures[184]. EMRs are essential to the future of healthcare because they assist all stakeholders

in the healthcare ecosystem coordinate care by providing crucial data that guides clinical decisions.[184].

EMR's usefulness has been shown to have several advantages for enhancing community health. For instance, the amount of time spent looking for the patient's records and the amount of storage space needed have both dropped. Electronic searches for records can be carried out at the computer quickly, unlike manual searches for paper medical records in folders. Therefore, efficiency would increase as a result of the more convenient electronic storage of a patient's records. Additionally, data may be updated and amended quickly using the EMR[183]. More crucially, easy data entry at the point of patient treatment would be guaranteed by the electronic medical records. An electronic medical record would contain standardized templates for the healthcare provider to input data based on the patient's presenting condition. The doctor may use a number of templates, such as those for demographic data, medical condition sheets, orders, prescriptions, image needs, follow-up notes, etc. The Health Information Manager can successfully save time, make fewer mistakes, and chart patient facts more succinctly than when using a hard form paper recording method by selecting and utilizing the correct template.

The utilization of the EMR system is much more crucial in the trauma care department. Such a system could offer the user a host of advantages, such as cutting down on recording time so that more time can be spent on medical care; while also raising the standard of the care provided and the documentation through the use of alarms, risk information, error reporting, etc. In intensive care or trauma units, some of these traits might even save lives. Information can be transferred both inside and outside of the hospital using EMR systems. When a provider is allocated to a

certain patient, the provider will receive access privileges to the patient's data as a user. With merely a username and password, the user may easily access the data about his or her patients on any networked computer. Information can be moved among organizations. As a result, a patient can visit nearly any hospital in the country and the hospital can quickly access the patient's medical records. EMRs also allow for better and more secure health information transfer through firewalls and encryption, ensuring that patient information is kept private. The EMR is highly helpful in ensuring that the patient's information can be quickly retrieved in emergency scenarios or natural catastrophes, and backups of the data to off-site facilities prevent loss of vital health information. Today's EMRs on the market make sure that medical professionals enter information with fewer keystrokes. These computerized solutions save time, money, and lives while operating faster than the paper-based approach. EMRs are also highly helpful for filing insurance claims because they can better manage any patient's data. [183].

The use of EMR in the healthcare system has proven to have a number of benefits, including the ability to increase patient care quality while lowering costs, ensure compliance with legal requirements and accreditation standards, and enhance accessibility and delivery of healthcare. Health information management professionals have been sluggish to adopt EMR into the healthcare system, and they are taking their time to learn how the system works, appreciate its advantages, come up with answers to its issues, and adjust the system. Adoption of EMR, particularly in outpatient or ambulatory settings has remained problematic[185]. Perceived usefulness has been measured using TAM theory and also different literatures of scholars through 5 indicators. These were- being fast (or quick), time saving, effort saving, cost reducing, and overall usefulness [186]. All these indicators contribute to the perceived usefulness of EMR in

healthcare. This work will adopt these metrics. Time saving features of EMR which also explains being quick, come to play where informed rapid life-saving decisions need to be made in split seconds with zero tolerance for errors. It is Improving time- efficiency by reducing time needed to perform a task. EMR reduces records retrieval and data communication times thereby enabling accurate, correct and prompt responses to healthcare consumer demands in an appropriate and timely manner[187] Effort saving refers to something that minimizes the amount of physical or mental energy needed to do it. Effort saving features of EMR come to play where physical or mental energy demands on the part of both provider and consumer of healthcare services are drastically reduced to barest minimum. It is Improving effort- efficiency by reducing activities and energy needed to perform a task. EMR reduces multiple manual administrative protocols, physically and geographically demanding tasks to few clicks on the keyboard while retaining efficiency and quality of service[188].

Cost-effectiveness of EMR is determination and selection of the most efficient and least expensive approaches to providing health care and preventive medicine services through informed decisions made possible through EMR utilization. One component, health education , focuses on helping people to assume some responsibility for t heir own health maintenance and avoid preventable illness and disability. Accident prevention pr ograms, immunization drives, andsafe-sex campaigns are designed to reduce the number of patients who will suffer preventable illnesses. To control costs, health care providers and health care customers must also understand the comparative value of procedures and medicines. EMR cost-effectiveness *is* producing good results without costing a lot of money. If a therapy or procedure is cost-effective, it is

good value for the amount of money paid: cost-effective methods or processes bring the greatest possible advantage or profit when the amount that is spent is considered. It is the degree to which electronic medical records is effective or productive in healthcare in relation to its cost. It is the greatest possible advantage or profit when the amount that is spent is considered. Producing good results for the amount of money spent or returning a benefit that justifies the initial investment. Electronic medical records cost effectiveness is in having a good value, where the benefits and usage are worth at least what is paid for them[189]. Overall usefulness is the quality of EMR towards having utility and especially practical worth or applicability Overall Usefulness means that electronic medical records can be made or used and can create positive results. Overall Usefulness means that there exists evidence on EMR that proves that it has a beneficial contribution towards the improvement of healthcare services and delivery or that EMR improves healthcare[190].

2.2 Theoretical Framework

2.2.1 Technology Acceptance Model (TAM)

TAM was created in the 1980s out of worry that people weren't leveraging the available information technologies [65, 191]. In order to expand technology use, according to the concept's founders, acceptance of the technology must first rise. This acceptance may be measured by asking people whether they have any plans to utilize the technology in the future. Organization management would be in a better position to influence those aspects in order to increase or encourage acceptance and use if they could identify and isolate the factors that influence people's intentions. Research factors that explain, predict, and maybe control acceptance are of interest to TAM. The Theory of Reasoned Action (TRA), a basic social-psychological/behavioral theory

that has been shown to be helpful for understanding a range of actions, was modified by the TAM model's creators to create the TAM model[192]. A preliminary study was conducted in order to assess what factors would be appropriate to include in order to explain technology use behavior, as was common for applying such theories to new situations [193, 194].

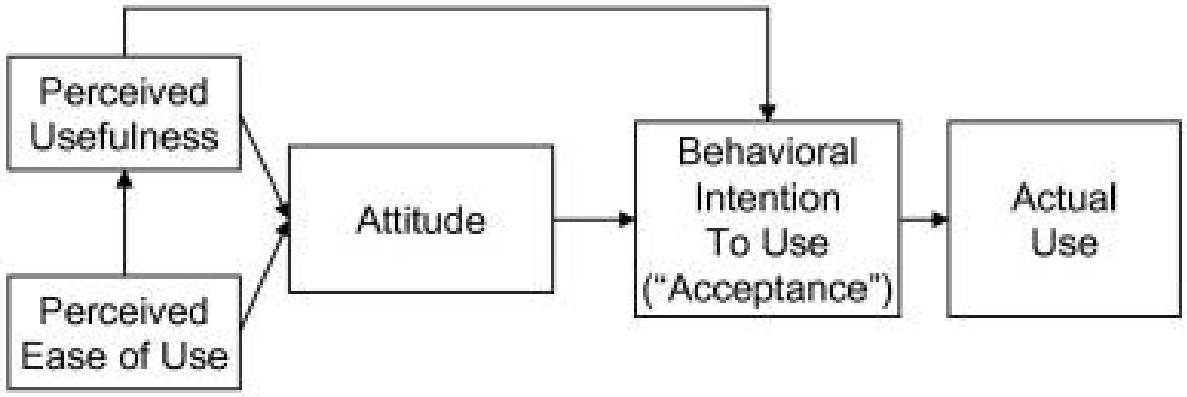

Fig. 2.1 Technology Acceptance Model
Source: Wikimedia Commons, the free media repository.

The variables that were selected, and formed the first version of TAM, (Fig. 2.1) the variables include Perceived usefulness, Perceived ease of use, Attitude, Behavioral intentions and actual use. Actual use implies frequency and purpose of use[195]. The most proximal antecedent to actual Information Technology use is behavioral intention to use it, and this is now commonly what is meant when one refers to acceptance [191, 196, 197], although another common conceptualization of acceptance is end-user satisfaction [198, 199]. Because behavioral intention is thought to reliably predict actual use, and the latter is difficult to measure, Behavioral intention is sometimes the only measured outcome of interest in a study of TAM [200, 201]. Behavioral intention is influenced by one's attitude toward using the technology. Attitude, in turn, has two determinants: perceived usefulness and perceived ease of use. Furthermore, perceived usefulness influences behavioral intentions, and Perceived ease of use affects perceived usefulness. TAM is a theory that has gone

through a number of changes. For example, an update of TAM removed the Attitude component from the model, which originally mediated some of the influence of PU and PEOU[65]. TAM upgrades also added a variable meant to capture the social influence (e.g., from colleagues or bosses) that compels end users to positively evaluate and accept IT, called subjective norm (SN). In order to give a method for anticipating acceptance and discretionary usage of information systems and technologies, Davis created the Technology Acceptance Model (TAM) [191]. The theory of reasoned action (TRA), which serves as the foundation for the TAM, contends that a person's attitudes toward a certain behavior are influenced by his or her beliefs[192, 193]. TAM includes ideas about how people accept technology and extrapolates them to various computer systems and user groups[160]. It is a commonly used and accepted method for forecasting information system user acceptability, and over time, it has consistently delivered trustworthy study results. The model lets researchers not to just forecast, but also explain why a specific system may or may not be acceptable to users [191]. The TAM is helpful in identifying pre-implementation attitudes toward information systems in settings where system use is optional rather than required, it is crucial to mention..

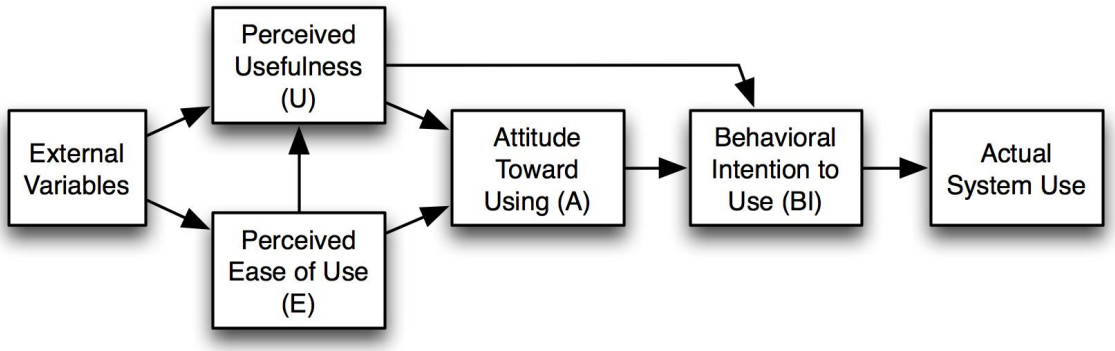

Fig. 2.2 Technology Acceptance Model
Source: Wikimedia Commons, the free media repository.

The TAM (figure 2.2) claims that the two beliefs of perceived usefulness and perceived ease of use are the key factors influencing consumer acceptability. A person's perception of how valuable a new information system is will determine how much they think it will enhance their ability to accomplish their job. The degree to which someone perceives a system to be simple to use and uncomplicated is known as perceived ease of use. Influenced by TAM, Nur'Ainy, Guritno, Siringoringo adapted quick, time saving, cost-effectiveness, effort saving and overall usefulness in measuring perceived usefulness. This study will adopt same metrics [186]. The TAM suggests that external variables indirectly determine an individual's attitude toward technology acceptance by influencing perceived usefulness and perceived ease of use [191]. External variables may include the characteristics of a specific user or those associated with their work duties. Other external factors may have an impact on how a system is developed and put into use, the features of its design, or the availability of sufficient training and user support. Perceived usefulness and usability may also be influenced by political factors and factors related to the workplace environment [191, 192, 193].

The TAM is a dominant model for examining user technology acceptance and has been shown in a number of studies to be superior to other models in examining health care providers' acceptance of telemedicine technology. This is because the TAM is constrained, specific to information technology, includes a well-researched and validated inventory of psychometric measurements, and is specific to information technology [202]. These studies employed the TAM to investigate the attitudes of health system executives and health information management professionals about acceptance and use of an electronic data management solution. Prior to the introduction of the system, other studies have also been effective in enlisting the TAM to investigate health workers' opinions toward EDMS adoption[203]. Compared to other information

system users, health professionals are more pragmatic and are more inclined to look for applications that are compatible with their work. These professionals may prioritize system utility over simplicity of use[203].

2.3 Empirical Studies

2.3.1 Ethical Practices and Usage of Electronic Medical Records

Findings from research shows that efficient encryption scheme that can easily be applied by both the Health Information Management Professional and the patients should be applied on the latest EMR records. In addition Role Based Access Control (RBAC) access control model in the electronic medical record system must be implemented while the best authentication mechanisms are passwords/logins and digital signatures. Effectively managing an electronic-health record requires multidisciplinary team including telecommunication, instrumentation and computer science to enable exchange of medical data across wider geographic regions[204].

In a survey of patient and public views on confidentiality, safety and privacy of electronic medical records by a scholar, 79 % of participants reported that they would worry about the confidentiality and security of their record if this was part of an EMR system and 71 % thought the facility was unable to guarantee EMR safety at the time this work was carried out. Almost half (47 %) responded that EMRs would be less secure compared with the way their health record was held at the time of the survey. Of those who reported being worried about EMR security, many would nevertheless support their development (55 %), while 12 % would not support national EMRs and a sizeable proportion (33 %) were undecided. There were also variations by age, ethnicity and education. In focus group discussions participants weighed up

perceived benefits against potential security and privacy threats from wider sharing of information, as well as discussing other perceived risks: commercial exploitation, lack of accountability, data inaccuracies, prejudice and inequalities in health provision[205]. Patient and public worries about the security risks associated with integrated EMRs highlight the need for intensive public awareness and engagement initiatives, together with the establishment of trustworthy security and privacy mechanisms for health information sharing.

In another work on Public and Health Information Managers expectations and ethical concerns about electronic medical records, 46% of the public and 91% of Health Information Management Professional were aware of EMRs. Health Information Managers and public opinions were comparable concerning the positive impact of EMRs on better, more effective, and faster decisions on the patients' health, on better coordination between hospitals/clinics and on quality and reduced cost of health care. However, Health Information Management Professional were concerned that an EMR system would be a burden for their finances, for their time concerning training on the system, for their everyday workload and workflow. The majority of the public generally agreed that they would worry about the possibility that a non-authorized, third party might gain access to their personal health information (48.8%), and that they would worry about future discriminations due to possible disclosure of their health information (48.8%). Most Health Information Management Professional disagreed that EMRs will disrupt the doctor-patient relationship (58.1%) but they would worry about the safety of their patients' information (53.1%). Overall, both the public and physicians were in favor of the implementation of an EMR system, evaluating that possible benefits are more important than possible risks. The majority of the public believed that physicians should have full access to an EMR (90.9%), whereas nursing staff, pharmacists, laboratory staff, and other healthcare professional should have partial access

[206]. The survey illustrates that both the public and physicians acknowledge the benefits and support EMRs on the condition that sufficient guarantees are provided about privacy and security.

In another survey on patient and public views on electronic medical records and its uses, 5331 patients and members of the public responded to the survey, with 2857 providing complete data for the analysis presented here. There were moderately high levels of support for integrated EMRs used simultaneously for health care provision, planning and policy, and health research 62.47%, while 27.93% of participants reported being undecided about whether or not they would support EMR use. There were higher levels of support for specific uses of EMRs. Most participants were in favor of EMRs for personal health care provision, 89.71%, with 66.75% stating that they would prefer their complete, rather than limited, medical history to be included. Of those "undecided" about integrated EMRs, 87.2% were nevertheless in favor of sharing their full 46.7% or limited 40.5% records for health provision purposes. There were similar high levels of support for use of EHRs in health services policy and planning 79.59% and research 81.38%, although 59.75% and 67.10% of respondents respectively would prefer their personal identifiers to be removed. Multivariable analysis showed levels of overall support for EMRs decreasing with age[207].

Despite previous difficulties with National Health Service technology projects, patients and the public generally support the development of integrated EMRs for health care provision, planning and policy, and health research. This support, however, varies between social groups and is not unqualified; relevant safeguards must be in place and patients should be guided in their decision-making process, including increased awareness about the benefits of EMRs for secondary uses. Given the widespread implementation of electronic health records, there are concerns about data

integrity that could jeopardize healthcare quality. Addressing concerns about data integrity and safety is critical to inform health policies and promote public trust. Participants in the research work on Privacy, Confidentiality, Security and Patient Safety concerns about electronic medical records expressed concern over the security of electronic health records (n = 270, 48%). Administrative-related security, inadequate training and access by unauthorized users were the most frequently reported concerns. The main patient safety concerns were associated with non-technological factors, including lack of audit by staff, poor communication with technology vendors and length of time required for documentation. The focus group results reflected similar issues, with an additional theme being inconsistency in data integrity policies[208]. Health Information Management Professional need to integrate pragmatic policies to support compliance with the code of Health Information Managers ethics when using online data. Health Information Management Professional must follow workplace policies that foster reporting of risks to online incident systems to ensure data integrity. A unified health policy based on multidisciplinary partnership is critical to safeguard online data and promote public trust.

The use of electronic medical record systems raises important ethical concerns about patient privacy/confidentiality, medical errors, expectations of structured data entry by Health Information Managers, documentation integrity, and provider-patient interaction. Health Information Managers and health care organizations need to define best practices and policies in the use of EMR systems to improve quality and maintain Health Information Manager efficiency without compromising patient welfare, safety and privacy[209]. Hospitals are rapidly implementing the electronic medical record (EMR) because it offers many demonstrated advantages over paper records. Issues of misuse of the EMR previously identified include breaches in confidentiality/privacy and inappropriate record sharing. Sets of ethical and quality problems of

the EMR that result from its otherwise beneficial timesaving features that inadvertently enable carelessness and harmful shortcuts are described. These problems include copying and pasting data obtained from other health professionals , authorship ambiguities, inadvertent inclusion of unobtained data in templated notes, misleading history and physical examinations, failure to review pre-populated data, inadequate discharge summaries, impairments to patient–care provider communication, and the transformation of the purpose of the medical record to billing documentation[210]. EMRs' practical difficulties have previously been reported, illuminating its moral ramifications. For instance, installation mistakes in imaging IT systems can result in inaccurate health status reporting with possible adverse health effects[211, 212]; paying insufficient attention to the necessary behavioral change management for the EMR might place an excessive time burden on healthcare professionals and have a negative impact on their job satisfaction[213]. Poor cyber security procedures were used in the deployment of EMR systems, endangering the privacy and confidentiality of patient health data [214].

Patients' faith in healthcare professionals might be harmed by the sharing of patient data with commercial parties[215, 216]. Failing to recognize the constraints and biases in datasets might result in the creation of AI algorithms that unfairly favor or target particular groups[217, 218]. In conclusion, although while the introduction of EMR is intended to improve the quality, safety, and effectiveness of healthcare and the delivery of health services, it may potentially have unforeseen negative effects. Therefore, ethical issues must be identified and handled throughout the whole lifecycle of the EMR system, from design through development, deployment, and continuous evolution, in order to optimize desired EMR impacts and minimize/eliminate the incidence of unfavorable EMR sequalae. It is difficult to assign responsibility for the safe, moral, and socially

desirable employment of EMRs across a complicated network of players[219]. Scholars assert that the expanded capabilities brought about by EMRs come with new or alternative risks and dangers. One example of a negative effect is the burnout of health information managers due to the use of EMRs[213]; improper medicine prescriptions or instructions due to software flaws [220]; risks to privacy linked to inadequate database security [221]; taking other clinicians' findings and pasting them without proverance of origin [222]; designing templates that produce false information [223, 224]; advocated medicines that do not follow established medical guidelines [225]; and discriminatory algorithms stemming from biased EMR datasets [226].

In essence, where EMR systems mediate healthcare delivery, adherence to ethical principles throughout the technology's lifecycle, from design to usage, is crucial. [227]. Patient privacy/confidentiality, Instant retrieval and information exchange through EHRs improve care, but also create the risk of unauthorized use, access, and disclosure of private patient information, raising confidentiality/privacy concerns. Unauthorized access could also have implications for patient family members if genetic information is involved. Respect for patient autonomy requires that patient encounters and information are kept confidential and private, fostering trust and improving communication[228]. Otherwise, patients might not disclose important information or may avoid seeking care, fearing denial of insurance, loss of employment, or stigmatization. While this is also true of paper records, concerns are heightened with EMRs because information is so readily transmitted and system breaches are not uncommon, despite security measures. Breaches may occur accidentally, through cyber attacks, or due to lapses in professional conduct, such as searching for test results of a family member or celebrity. All of this is easier to accomplish and track electronically.

2.3.2 Perceived Usefulness and Usage of Electronic Medical Records

According to scholars, many healthcare facilities tried to implement EMR system, mainly to improve health information recording process[229, 230, 231, 232, 233]. In the context of developing countries, several technological, organizational and social issues such as electrical power interruption, health professionals technology resistance, infrastructure and administrative problems have slowed the pace of implementation and adoption of EMRs[234]. Problems related to lack of planning, increased provider time, computer down time, lack of standards to interchange information, user resistance and threats to confidentiality negatively contribute for the successful implementation of EMR [235]. Even though there is a high expectation and interest in EMR as great prospect for improving quality, continuity, safety, and efficiency in healthcare, the overall adoption rate is relatively low [236, 237]. Fifty percent of health information system failed to utilized EMRs properly [229, 238, 239].

In a study conducted on Satisfaction and Perceived Usefulness with newly implemented electronic medical records system, out of the 112 physicians who completed the survey, 97 (86.6%) attended training courses before the implementation of new EMR. On average, the participants rated the perceived usefulness of the new system at 64% for patient care and physicians' satisfaction levels were 52%. The top indicator of EMR usefulness was the system's ability to reduce errors and improve the quality of care 82.8%; the lowest-ranking indicator was the physicians' perceived familiarity with functions and benefits 67%. The top indicator of satisfaction with the EMR system was enhanced "individual performance" 60.9%; the lowest-ranking perceived indicator was the limited availability of workplace computers 38.2%[240]. In another research on Checking the Potential Shift to Perceived Usefulness – The Analysis of

Users Response to the updated electronic medical records, the response to the initial functionalities, perceived as easy to use, was high as expected since they kept the users in their "comfort zone". As regards the updated features, the ones corresponding to the perceived usefulness, the initial overall acceptance rate was 60%, while the overall increase of their acceptance was around 20%. The overall usage of the newly introduced features was doubled in some cases throughout the four-year period, while some of them were not accepted as expected[241].

Another study on The Patient's Care Requires Physician burnout, according to Care of the Provider, is largely caused by frustration with EMRs, notably the time needed to interact with them [242]. In a poll of 561 Massachusetts doctors, 30% of them thought that utilizing EHRs created more room for mistakes in patient care[243]. EMR technology dissatisfaction is on the rise, with 12 percent more doctors complaining about their EMR system in 2012 than in 2010[244]. Understanding healthcare providers' opinions on the benefits and difficulties of utilizing these systems in clinical practice is the subject of another study. In order to examine many situations that illustrate this phenomenon and to compare Health Information Manager perspectives regarding the use of EMRs, a qualitative multiple-case study approach was used. The results demonstrate that increased EMR adoption rates and a parallel rise in health information management Professional unhappiness with the systems poses a problem for all parties involved in the healthcare system and raises crucial considerations about how it will affect patient satisfaction, care quality, healthcare costs, the effectiveness of healthcare delivery, and provider satisfaction..

Another study showed a lack of compatibility across various systems, which made it impossible for medical entities to share clinical data [245]. 88 percent of research participants cited this worry as a major obstacle to the effective usage of these systems. Only one practice reported consistently exchanging clinical data with other medical entities utilizing EMRs among the 12 participants who are currently using an EMR system. Participants reported annoyance with this aspect of using EMRs, and the majority also voiced doubt about future solutions. Information Management for Health Professional skepticism about interoperability was based on their knowledge that EMRs from various vendors could not communicate with one another, a conviction that the market's expanding number of vendors made the problem worse, the perception of a lack of interoperability standardization among vendors, and the failure of business and government to date to develop trustworthy and long-lasting technical and financial solutions for electronic information exchange[245].

Health Information Managers in this study believed that using EMRs in health facilities adds significant time to the clincians' workday and that this increased workload is a major disadvantage of the technology. 92% of adopters and partial adopters said that using EMRs added time to their workday, with the majority indicating that the use of the systems required significantly more administrative time than that required for documentation in paper charts. Several participants indicated that their administrative time doubled because of EMR requirements[245]. The majority of participants did not believe that adopting EMRs improved the standard of care they provided patients with, although acknowledging that doing so increased availability and access to health data, improved readability, and increased efficiency in providing treatment. The majority of doctors in this study did not draw the connection between greater

access to the medical record and higher patient care quality, despite the fact that it might appear obvious. Only 17% of health information management specialists who use EMRs think that using the system enhances the treatment they give patients. Participants were asked if they felt that meaningful use of EMRs increased the quality of treatment, and 63% responded that they did not [245]. These opinions are consistent with the results of a recent study, where participants similarly expressed concerns about the return on investment vs the amount of time needed for documentation and questioned the effectiveness of meaningful use criteria. The use of EMRs, according to 246 participants in a separate study, may increase the quality of documentation, but they did not think that significant use of EMRs would raise the standard of treatment. Although the authors noted that the use of health information technology (such as EMRs) has grown during the previous ten years, "the quality and efficiency of patient care are only marginally better"[247]. Other authors have also stated that current research suggests that it might be more difficult than anticipated to meet these meaningful use norms [248].

The view among some study participants in another research is that EMRs produced clinical information that is either inaccurate or unrelated to patient care, which runs counter to the notion that adopting EMRs will improve the quality of care. Despite not being asked specifically about the phenomena, 38% of participants (6 of 16) expressed this opinion. Participants mentioned getting consultation reports on patients from doctors using EMRs that had inaccurate information and irrelevant material that diminished the report's value and typically required extra work to clarify or amend the information[245]. The EMR consultation reports, according to some participants, are overly wordy in comparison to previous notes or phone conversations that clearly summarized consultation outcomes.[245]. Some participants described how they also made errors in seemingly routine data input areas that led to inaccurate clinical information during

interviews. This conclusion is confirmed by a study in which healthcare professionals at 11 primary care clinics entered patient information incorrectly, leading to false clinical data[249]. In addition, Makam, Lanham, Batchelor, and Samal noted that enormous notes with redundant or superfluous data may be encouraged by the organized documentation required by EMR templates[250]. Similar issues with EMR data obstructing doctors' clinical decision-making and care coordination were reported in another study[251].

In a research work titled 'Towards personal health record: current situation, obstacles and trends in implementation of electronic healthcare record the study shows that when EMRs are simple to use, accessible, and available while providing medical care services to patients both physically and digitally, HIM professionals may be satisfied with them. However, if patient records are poorly integrated and prone to inaccuracy, they could still be seen as being of low value and result in unfavorable experiences[252]. Another study confirms that the use of EMRs could improve the intention to continue using them. Users may consider their performance to be higher or lower than they anticipated before using EMR. In contrast to the latter, the former is regarded as a good confirmation experience [253]. Positive user perceptions of the value of electronic medical records frequently result in user satisfaction and sustained use, whereas negative confirmation results in usage discontinuation [254]. Verification of the anticipated advantages of EMR has a favorable effect on its use. In terms of institutional EMR experience, institutions using the technology for less than a year experience almost little impact from perceived usefulness over time, but those using it for a year or more have a pretty high rating coefficient. However, organizations that have employed the system for a year or longer have noticed a similar impact from perceived usefulness to that of more experienced Health Information Management Professionals.

Recent studies echo mixed sentiment of EMR implementation[255]. The work titled effects of implementation of EMR in small hospitals on healthcare objectives points out medical organizations underestimate time, budget and resources for its implementation. Specifically, he cites "lack of adaptation period, workflow disruption, slow program speed through a resource-heavy interface, negative office culture, lack of consistency using the software, and anemic support services" as challenges of EMR system implementation and realization of usefulness[255].

A National Ambulatory Medical Care Survey found that from an initial 18% to 31%, health information managers were using electronic medical records. About 11.2% of healthcare professionals who utilized EMRs used them fully, whereas 12.7% used them only partially. The EMR usage rates among Health Information Managers are generally consistent when taking into account age, sex, and specialty kinds. The size of the facility, the number of hospital specialties, the existence of insured care contracts, etc., all had an impact on the EMR usage[256]. The EMR usage rate in the US was around 26.9% in the Midwest and 33.4% in the West. The Northeast had the lowest EMR utilization, with 14.4%. EMR usage was almost 24.8% in urban areas compared to 16.9% in rural and other locations. The EMR is used by more than 21.4% of HIM professionals to record and display demographic information. Only 5.4% of doctors, however, are genuinely able to provide epidemiological or public health statistics. The Health Information Managers were more likely to utilize the EMR to place orders, write prescriptions, order lab tests, get lab results, take and record nursing notes, set reminders and alerts, etc. if they used it exclusively[257]. Up to 90% of healthcare facilities may genuinely have EMRs, according to studies done in Sweden and Norway, where the installation of the EMR systems has been more intensive [258]. The adoption of EMR offered a healthcare facility a number of advantages. The

business generated more money and had higher profit margins [258]. According to a research done in Nigeria, some of the aspects of the EMR that the healthcare professional found beneficial were entering, viewing, and editing patient health data, writing prescriptions and refills, making appointments and referrals, ordering tests, etc. Among these, enabling the doctors to write prescriptions electronically was one of the EMR system's most important features. According to the usefulness of the EMR system, about 82% of respondents thought that there would be a positive impact on the standard of care, 92% thought that interactions and communications would improve, 97% thought that accessing the patients' records was convenient, and 86% thought that the rate of errors would be reduced significantly. The use of the EMR, according to the health information officers, helped to avoid drug interactions and allergies, notify crucial laboratory values, and make sure that preventive steps were possible.

The utilization of an advanced EMR system was rated as satisfactory by around 93% of the health information managers, while a basic system was rated as satisfactory by about 88% of them. An advanced EMR system was more likely to make health information officers satisfied[256]. A few other obstacles to the adoption of the EMR by health information managers were high investment costs, challenges in selecting a system, challenges in maintaining an existing system, etc. Due to the financial incentives that were accessible to them, a significant number of health information managers decided to use an EMR system. An EMR system, according to about 40% of health information officers, might help prevent tampering with patient medical records that might be done during the determination of liability in medico-legal situations. Studies have also revealed that health information officers are more likely to use medical records when they work in a group (greater than 50) or in a hospital. Additionally, a bigger practice adoption of the EMR

system compared to a smaller number of Health Information Managers increased the probability of the EMR technology being upgraded and used for various purposes by four times[183]. There was better control over service quality issues when electronic medical records were employed in larger hospitals and were completely functional. Without doing direct clinical research, it may be challenging to determine how much the EMR actually improved the cost effectiveness and quality of patient outcomes. Health information officers who used basic EMR systems were more anxious about accuracy and mistakes, which raised their level of anxiety[183]. The use of the EMR system may face obstacles or restrictions, which worried health information managers.

2.3.3 Ethical Practices and Perceived Usefulness on Usage of Electronic Medical Records

Health Information Managers and healthcare consumers believe and agree on the positive impact of EMRs on better, more effective, and faster decisions on the patients' health, on better coordination between hospitals/clinics and on quality and reduced cost of health care. The concept of EMR connotes training in computer usage and ethics pertaining to EMR as against traditional settings of erstwhile practice. Studies have shown that Health Information Officerss require basic training in the use of computer systems as against the manual methods, also there is need for customization of clinical ethics as it pertains to the EMR platform. Certainly this changes require commensurate modifications in skill set and knowledge which can only be acquired through training[242]. The overall computer use skill among doctors more than 80% of them can perform all the functions required for EMR use. Among Nurses computer use skill was 66.3% can perform simple functions required for EMR use. Among other Health Information Officerss, more than 70% can perform all the functions required for EMR use inquired[270]. The use of electronic medical record systems raises important ethical concerns about patient

privacy/confidentiality, medical errors, expectations of structured data entry by Health Information Managers, documentation integrity, provider-patient interaction and general perceived usefulness of the software. Health Information Managers and health care organizations need to define best practices and policies in the use of EMR systems to ensure technological adequacy, justify usefulness, improve quality and maintain Health Information Manager efficiency without compromising patient welfare, safety and privacy[209].

Hospitals are rapidly implementing the electronic medical record (EMR) because it promises and offers many demonstrated advantages over paper records. Issues of misuse of the EMR previously identified include breaches in confidentiality/privacy and inappropriate record sharing and technological appropriateness especially as regards interoperability and capabilities. These problems include copying and pasting data obtained from other Health Information Managers, authorship ambiguities, inadvertent inclusion of misleading history and physical examinations, failure to review pre-populated data, inadequate documentations and impairments to patient–care giver communication[210]. A combination of ethical practices and perceived usefulness has potentials to positively influence healthcare services and delivery but findings have proven that there are more to the use of EMR than the theoretical assertions as findings have also revealed the existence of undesirable outcomes mediated by the combined influence of ethical practices and the perceived usefulness of EMR In a survey of patient and public views on confidentiality/privacy and safety of electronic medical records by a scholar, 79 % of participants reported that they would worry about the confidentiality and security of their record if this was part of an EMR system and 71 % thought the facility was unable to guarantee EMR safety at the time this work was carried out. This results indicate less than 30% trust and confidence in the

use of EMR to deliver health services. This is in contrast to the assumed advantages and great dividends that EMR is advertised and expected to deliver. Almost half (47 %) opined that EMRs would be less secure compared with the way their health record was handled. Of those who reported being worried about EMR security, many would nevertheless support their EMR use (55 %) with doubts, while 12 % would not give it a try[205]. The majority of the public generally agreed that they would worry about the possibility that a non-authorized, third party might gain access to their personal health information (48.8%), and that they would worry about future discriminations due to possible disclosure of their health information (48.8%). This was against the advantage of easy availability that EMR offers. It was noted that timely retrieval and availability in the wrong hands will result in the disaster of unauthorized access and the accompanying negative outcomes.

EMRs were created to automate or digitize the manual workflow. Findings have proven otherwise as seen in conflicting roles, duplication of roles and professional encroachments due to errors or extraneous software programing. Some of this conflicting roles have serious ethical risks. Most Health Information Management Professional disagreed that EMRs will disrupt the regular workflow or doctor-patient relationship (58.1%) whereas 42.9% believe EMRs can actually have negative potentials in workflows and caregiver-patient relationship but collectively they would worry about the safety of their patients' information (53.1%).. The majority of the public suggested a stratified access levels where the physicians should have full access to an EMR (90.9%), whereas nursing staff, pharmacists, laboratory staff, and other healthcare professional should have partial access [206]. The survey illustrates that both the public and Health Information Officers acknowledge the benefits and support EMRs implementation on the condition that sufficient guarantees are provided about privacy and security[206]. There were

similar high levels of support for use of EMRs in health services policy and planning 79.59% and research 81.38%, although 59.75% and 67.10% of respondents respectively would prefer their personal identifiers to be removed[207]. Given the widespread implementation of electronic health records, there are concerns about data integrity that could jeopardize healthcare quality and safety. Addressing concerns about data integrity and safety is critical to inform health policies and promote public trust. Participants in the research work on Privacy, Confidentiality, Security and Patient Safety as regards electronic medical records expressed concern over the security of electronic medical records 48%[208]. EMRs' practical difficulties highlight their ethical ramifications. For instance, installation mistakes in imaging IT systems can result in inaccurate health status reporting with possible adverse health effects[211, 212]; which goes against clinical ethics ideals of beneficence, non-malfeasance, confidentiality, autonomy etc and negates any perceived usefulness.

Documentation can take an excessive amount of time from health care professionals and have a bad impact on how they feel about their jobs[213]. When EMR systems are installed with inadequate cyber security procedures, the privacy and confidentiality of patient health data are put at risk[214]. Lack of awareness of the constraints and biases in datasets can result in the creation of AI algorithms that unfairly favor or target particular populations[217, 218]. In conclusion, although the introduction of EMR is intended to improve the quality, safety, and effectiveness of healthcare and the delivery of health services, it may potentially have unforeseen negative effects. Therefore, ethical issues must be identified and handled throughout the whole lifecycle of the EMR system, from design through development, deployment, and continuous evolution, in order to optimize desired EMR impacts and minimize/eliminate the incidence of unfavorable EMR sequalae. It is difficult to assign responsibility for the safe, moral, and socially desirable

employment of EMRs across a complicated network of players[219]. In as much as EMR promises a whole lot of goodies of improved efficiency, enhanced safety and reduced cost, According to academics, the additional capabilities brought about by EMRs come with new or alternative risks and dangers. One example of a negative effect is the burnout of health information managers due to the use of EMRs[213]; software flaws can expose patients to risks by giving them the wrong medicine prescriptions or instructions [220]; risks to privacy linked to inadequate database security [221]; using another Health Information Manager's findings without indicating where they came from [222]; designing templates that produce false information [223, 224]; promoted prescriptions that deviated from accepted medical standards [225]; and discriminatory algorithms stemming from biased EMR datasets [226].

EMR is expected to simplify routine actions and activities in healthcare service delivery and boost performance and efficiency, it is designed to achieve more while requiring minimal effort but in a study conducted on Satisfaction and Perceived Usefulness with newly implemented electronic medical records system. On average, the participants rated the perceived usefulness of the new system at 64% for patient care and Health Information Officers satisfaction levels were 52%. The top indicator of EMR usefulness was the system's ability to reduce errors and improve the quality of care 82.8%; the lowest-ranking indicator was the Health Information Managers perceived familiarity with functions and benefits 67%. The top indicator of satisfaction with the EMR system was enhanced “individual performance” 60.9%; the lowest-ranking perceived indicator was the limited availability of workplace computers 38.2%[240].

Although EMRs improved some aspects of healthcare delivery, particularly documentation management, a different study on Care of the Patient Requires Care of the Provider suggests that

dissatisfaction with EMRs—specifically, the time needed to interface with them—is a significant factor in health information officers' burnout [242]. In a survey of 561 health information managers, 30% of respondents thought that utilizing EMRs increased the risk of patient care errors[243]. Understanding healthcare providers' opinions on the benefits and difficulties of employing these systems in a healthcare facility is the subject of another study.

Another study showed a lack of system interoperability, which made it impossible for medical entities to communicate clinical data 25. 88 percent of research participants cited this worry as a major obstacle to the effective usage of these systems. Only one practice reported consistently exchanging clinical data with other medical entities utilizing EMRs among the 12 participants who are currently using an EMR system. Participants reported annoyance with this aspect of using EMRs, and the majority also voiced doubt about future solutions. The view among some study participants in another research is that EMRs produced clinical information that is either inaccurate or unrelated to patient care, which runs counter to the notion that adopting EMRs will improve the quality of care. Despite not being asked specifically about the phenomena, 38% of participants (6 of 16) expressed this opinion. Participants described obtaining consultation reports on patients from doctors who used EMRs that contained inaccurate information and irrelevant details that diminished the report's value and typically required extra work to clarify or rectify the details[245]. The EMR consultation reports, according to some participants, are overly wordy in comparison to previous notes or phone conversations that clearly summarized consultation outcomes [245]. Some participants described how they also made errors in seemingly routine data input areas that led to inaccurate clinical information during interviews. This conclusion is confirmed by a study in which healthcare professionals at 11 primary care clinics entered patient information incorrectly, leading to false clinical data[249]. Additionally, Makam,

Lanham, Batchelor, and Samal noted that organized recording demanded by EMR templates may encourage bigger notes including redundant or superfluous data in a significant survey of primary care clinicians[250]. EMR promises comprehensive and accurate documentation but Health Information Managers in this study believed that using EMRs in hospitals adds significant time to the clinician's' workday and that this increased workload is a major disadvantage of the technology. 92% of adopters and partial adopters said that using EMRs added time to their workday, with the majority indicating that the use of the systems required significantly more administrative time than that required for documentation in paper charts. Several participants indicated that their administrative time doubled because of EMR requirements[245].

The majority of participants did not believe that adopting EMRs improved the standard of care they provided patients with, although acknowledging that doing so increased availability and access to health data, improved readability, and increased efficiency in providing treatment. The majority of doctors in this study did not draw the connection between greater access to the medical record and higher patient care quality, despite the fact that it might appear obvious. Only 17% of health information management specialists who use EMRs think that using the system enhances the treatment they give patients. Participants were asked if they felt that meaningful use of EMRs increased the quality of treatment, and 63% responded that they did not[245]. According to a research done in Nigeria, some of the aspects of the EMR that the healthcare professional found beneficial were entering, viewing, and editing patient health data, writing prescriptions and refills, making appointments and referrals, ordering tests, etc. Among these, enabling the doctors to write prescriptions electronically was one of the EMR system's most important features. According to the usefulness of the EMR system, about 82% of respondents thought that

there would be a positive impact on the standard of care, 92% thought that interactions and communications would improve, 97% thought that accessing the patients' records was convenient, and 86% thought that the rate of errors would be reduced significantly. The use of the EMR, according to the health information officers, helped to avoid drug interactions and allergies, notify crucial laboratory values, and make sure that preventive steps were possible. The utilization of an advanced EMR system was rated as satisfactory by around 93% of the health information managers, while a basic system was rated as satisfactory by about 88% of them. An advanced EMR system was more likely to make health information officers satisfied[256].

There was stronger control over service quality issues in areas where electronic medical records were completely functional. To what extent the EMR genuinely enhanced the cost effectiveness and quality of patient outcomes, however, may be difficult to determine without conducting direct clinical research. The Health Information Officers who used the basic EMR systems were more concerned about the accuracy and mistakes because they were using these tools[183]. The use of the EMR system may face obstacles or restrictions, which worried health information managers.

2.4 Conceptual Framework

Independent Variable **Dependent Variable**

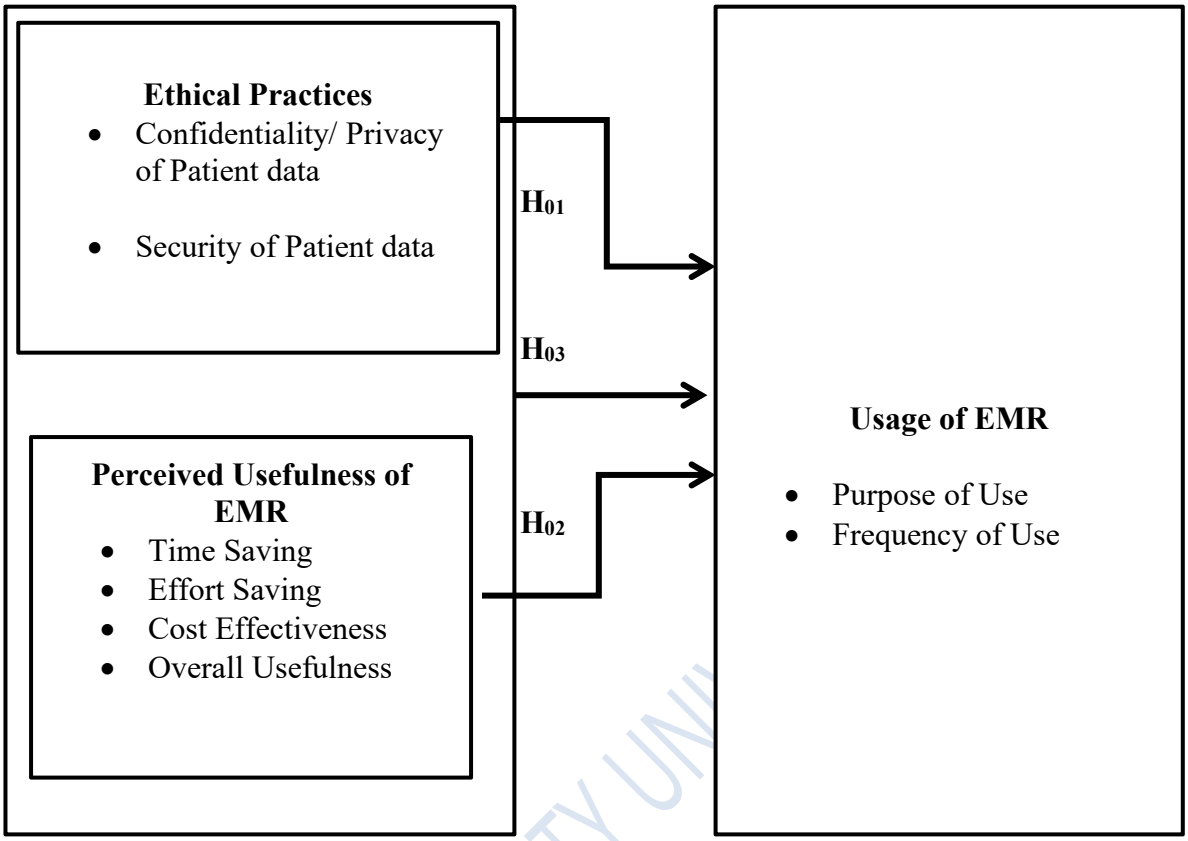

Fig 2.3:
Conceptual Framework on Ethical Practices, Perceived Usefulness and Usage of EMR.
Source: Researcher 2022

The conceptual framework in figure 2.3 above show that the model has three major dimensions namely, usage of electronic medical records as the dependent variable, ethical practices and perceived usefulness of electronic medical records as the independent variables. The Dependent variable, Usage of EMR will be measured by Purpose of Use and Frequency of Use electronic medical records[195]. Ethical Practices, the first independent variable as it concerns the use of Electronic Medical Records will be measured by confidentiality/privacy and security of patient data[128]. While Perceived usefulness as a second independent variable will be measured by Time Saving, Effort Saving, Cost Effectiveness, and Overall Usefulness [185]. These variables will be used to test the following hypotheses, influence of ethical practices on EMR usage, Influence of Perceived usefulness on EMR Usage and the combined influence of Ethical Practices and

Perceived Usefulness on the usage of EMR

2.5 Summary of Literature Reviewed

The degree to which people believe they can improve their performance through technology is referred to as perceived usefulness[259, 260, and 261]. Some scholars agreed that intention to use EMR was positively impacted by perceived utility. Contrary to some schools of thinking, this shows that the intention to use was not negatively impacted by perceived utility[262]. It can be claimed that a technology is ready to use when users accept it well and have no problems using it or hesitancy when using it. Technology readiness was shown to positively influence the intention to adopt EMR in studies [263, 264]. Task Technology Fit (TTF) is one of the behavioral approach information systems theories that describes how tasks and information and communication technology interact with one another [265, 266]. TTF serves as the theoretical foundation for information systems research that looks at challenges with task compatibility with information and communication technology (ICT)[265].

Meaning that TTF highlights how information technology and task execution precision will promote employee performance inside the firm. The capacity of technology to assist a task often referred to as task-technology fit, which is the matching of technology capabilities with job requirements[267]. The TTF model, developed by Goodhue and Thompson, expands the TAM by taking into account how a task influences the use of technology[259]. The most popular methodology for determining the elements influencing technology acceptance is the TAM. According to TAM theory, when consumers are exposed to new technology, a variety of factors affect their choice of how and when to use the technology[260]. The purpose of TAM is to be able to explain user behavior across a broad range of end-user computing technologies and user populations, as well as the factors that influence technological

acceptance[261]. TAM made an effort to pinpoint the key factors that earlier studies had suggested. It details the connections between perceived utility, perceived simplicity, usage mindset, and intention to use technology[267, 163]. The fundamental tenet of the TAM is that people's use of technology is mediated by their acceptance of it, and that acceptance is in turn influenced by two cognitive factors: perceived utility (PU) and perceived ease of use (PEOU) [268]. In other words, it refers to how much a person thinks utilizing technology would enhance the quality of his or her work.

Therefore, users are more likely to want to adopt a technology the more valuable it is. Stakeholders will use EMRs if they perceive their benefits; otherwise, if they do not perceive these benefits, they will not want to use the system[269] . Intention to adopt EMR was influenced by perceived utility[261].

Poor data quality, inadequate data, inconsistent data reporting, and late data submission are issues raised by various research in Nigeria on health data and healthcare quality. The use of manual data entry methods is one of the things driving this issue. To strengthen the health system, it has been suggested that a functional, well-run automated health data management system is necessary. Due to a lack of infrastructure, people, funding, political will, and computer and information technology expertise, meeting the problems of data demands for the healthcare business is frequently a daunting task. Only a limited implementation was made in places where EHR was accepted. Hospitals reported a variety of problems with gathering and interpreting use data, including a lack of standards or procedures for determining what metrics to use or what data points to track in order to measure utilization.

Although there are studies on the influence of EMR as an Information System on healthcare quality and performance, the number of studies on EMR usefulness in healthcare setting is limited. Secondly, notwithstanding the fact that many researchers have looked at the direct

impacts of EMRs on user performance, the mediating role of perceived usefulness on the association between EMR and user performance implications have not been sufficiently explored. Thirdly, researchers have used Technology Task Fitness, Technology Acceptance Model and DeLone & Maclean models and theory independently to evaluate the acceptance and use of technology and a focus on their integration has not been adequately addressed. Fourthly, few researchers have studied these relationships in healthcare organizations in developing countries. It was suggested that more research be done to determine the effects of culture, technology, self-efficacy, user involvement and participation, past usage and experience, perceived voluntariness, personal innovativeness, and user characteristics on adoption attitudes.

The high initial price of purchasing an EMR system is one of the major worries voiced by healthcare providers. For each physician, the cost of purchasing an EMR system varied from sixteen thousand to thirty six thousand dollars. Some doctors had the issue of seeing fewer patients during the EMR installation phase, which further increased the costs. Additionally, there were early difficulties with figuring out how to use the EMR system and having to spend additional time with each patient to enter and access the data. This raised more questions because it now took more time. Professionals in health information management frequently find using computers to be quite challenging. The best ways to use the advantages of the EMR system for the institution must be determined by each unique company. To ensure that EMRs are applicable everywhere, there is a clear need to address the significant differences in how technology and related services are distributed between rural and urban areas. Additionally, much work needs to be done to increase the interoperability of EMR systems within healthcare delivery networks,

and EMR training needs to be incorporated into the curriculum of medical schools to encourage system acculturation.

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Chapter Three

Methodology

This chapter presents the methodology that will be utilized in this study. It includes the research strategies employed, population sample, data collection, data analyses and operation of variables.

3.1 Research Design

The research design for this study was descriptive research design. Descriptive research design answers the question asked by the problem under investigation and the purpose is to collect detailed information that describes existing phenomenon in order to identify the problem or justify current conditions and practices. Descriptive design accurately and systematically describes a population, situation or phenomenon. Descriptive research design allows for a wide variety of research methods to investigate one or more variables. Descriptive design facilitates appropriate identification of characteristics, frequencies, trends, and categories[1].

3.2 Population of Study

The target population for this study is comprised of the health information professionals working in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos. The total population for this study was one hundred (100) health information management professionals

Table 3.1

Health Facility	Number of Employee
N.O.H, Igbobi, Lagos.	60
F.N.P.H, Yaba, Lagos.	40
Total	100

Source: Admin Dept. of both health facilities 2022

3.3 Sample Size Determination and Sampling Techniques

The sample size for this study was one hundred (100) health information management professionals in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric

Hospital, Yaba, Lagos [2]. This study employed total enumeration of health information management professionals in both facilities.

3.4 Description of Research Instrument

The instrument used in data collection in this research was a structured questionnaire. It was constructed to ensure that the objectives and the statement of problem stated in chapter one were explored. The study adopted the Likert scale design allowing the researcher to list options which respondents selected from. The instrument of this study was made up of four sections.

Section A: This section is self-designed to collect demographic information of respondents and this contains bio-data of respondents measured through five factors: Age, Gender, Marital Status, Length of Service, Profession.

Section B: This section is designed to collect data on the Usage of Electronic Medical Records. This section is has eight items with a four point scale. The four point scales are Very Often = 4, Often = 3, Sometimes = 2, Rarely = 1,. This research instrument with Cronbach value of 0.91 was adapted from literature to measure frequency and purpose of use of the EMR.[3] examples of questions to be asked include any form of EMR use for Patient Care, Research and Education, Hospital Administration Resource Allocation or Medico-legal purposes as well as the frequency of these uses.

Section C: This section was designed to collect data on Confidentiality/Privacy and Security aspects of Ethical Practices. This section is has seven items with a four point scale. The four point scales are Strongly Agree = 4, Agree = 3, Strongly Disagree = 2, Strongly Disagree = 1. This research instrument with Cronbach value of 0.89 was adapted to measure Confidentiality and

Privacy of EMR[4]. This section focuses investigation on EMR having potentials of possible privacy breach or violation due to multi-user features, presence role based accesses as a protective measure to EMR, unethical and unauthorized sharing of patient sensitive data over personal unsecured network among care providers, ensuring compliance with consent protocol as well as all security measures to protect data on EMR.

Section D: This section is designed to collect data on Perceived Usefulness of Electronic Medical Records. This section is has twelve items with a four point scale. The four point scales are Strongly Agree = 4, Agree = 3, Strongly Disagree = 2, Strongly Disagree = 1. This research instrument with Cronbach value of 0.82 was adapted from the Perceived Usefulness variable of TAM[5]. Questions in this section will focus on investigating the timeliness, effort-saving, cost effectiveness and overall usefulness of EMR

3.5 Validation of Research Instrument

To validate this research instrument, its contents were obtained through related literature review and adaptation of previous questionnaires utilized by other researchers on related topics. Both construct and content validity were done with the input of the supervisor and other experts in the field of information management. Corrections made will be incorporated in constructing the final questionnaire that will be given out to respondents of this study.

3.6 Reliability of Research Instrument

In ensuring the reliability of the data collection instrument, the questionnaires were tested by subjecting it to the inspection of experienced authorities in the areas of interest of this work, who gave their opinions as to whether the hypotheses used to measure the concepts were valid to

ensure it covers all variables under study. A Cronbach's alpha value score of ≥ 0.7 for a questionnaire is accepted. The researcher subjected the questionnaire to a reliability test to check the internal consistency of all items measuring each variable in the study. The reliability of the instrument was done through a pilot survey using 15 questionnaires were administered to Health Information Management Professional at Lagos State University Teaching Hospital, Ikeja, Lagos., to assess the response and reliability rate of the questionnaire and to justify what the study is set to attain. Data obtained were subjected to Cronbach's alpha reliability test to establish consistency. The result of the reliability test showing Cronbach Alpha's coefficient of 0.91, 0.89, and 0.82 for adequacy in measuring EMR usage, ethical practices and perceived usefulness respectively argues that the instrument is dependable for the primary research.[6].

3.7 Method of Data Collection

A letter of introduction and project attestation form was obtained from the department of information management, Lead City University which was used to gain permission to conduct the survey from the managements of National Orthopaedic Hospital, Igbobi, and Federal Neuro-Psychiatric Hospital Yaba, both in Lagos State. Two (2) days training session was conducted for research assistants to facilitate the ease of administration, retrieval and initial sorting of the research instrument. In all, one hundred questionnaires were administered to health information management professionals in National Orthopaedic Hospital, Igbobi and Federal Neuro-Psychiatric Hospital, Yaba, both inLagos

3.8 Method of Data Analysis

The researcher analyzed the data collected using descriptive and inferential statistics. Frequency distribution, Mean and percentages of response were used for descriptive analysis of the research questions. To test the hypothesis, linear regression analysis were used for hypothesis one and two while multiple regression analysis was used for hypothesis three. Data collected for the study was analyzed using statistical package for social sciences (SPSS) version 25. All hypotheses will be tested at 0.05 level of significance. [7].

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Chapter Four

Results and Discussion of Findings

The aim of this chapter is to present the results of the data collected and analyzed to achieve the objectives of the study. The data was obtained to answer the research questions and test the

hypotheses formulated for the study. This was achieved with the use of a questionnaire which dictates that the descriptive statistics is used to answer the research questions and inferential statistics used for the study hypotheses.

This chapter will deal with data presentation, analysis and the interpretation of the results. The analysis is guided by the specific objectives and the hypothesis that were formulated in the study. The first section shows the presentation of the descriptive analysis using tables showing percentages and interpretation below the tables. The inferential statistics (using regression analysis) and discussion of the findings comes at the latter part of chapter. Results presented were based on research questions and hypotheses which the study set out to answer and examine.

4.1 Demographic Data Analysis of Respondents

Table 4.1 Response Rate

Response Rate	Frequency	Percentage (%)
Returned Filled and |Useful	80	80
Not Filled, Returned or Invalid	20	20
No. of distributed copies of questionnaire	100	100

Source: Field survey Data 2022

Table 4.1 above shows that one hundred (100) questionnaires were distributed, out of which eighty were returned completely and properly filled showing 80% were found adequate and useful for this work. Data was analyzed using SPSS version 25.

Table 4.2 Demographic Characteristics of Respondents

Variables	Category	Frequency	Percentage (%)
Age	<25	10	12.5
	25-35	36	45.0
	36-45	26	32.5
	46>	8	10.0

	Total	**80**	**100.0**
Sex	Male	22	27.5
	Female	58	72.5
	Total	**80**	**100.0**
Marital Status	Single	22	27.5
	Married	58	72.5
	Total	**80**	**100.0**
Length of Service	<1	10	12.5
	1-5	24	30.0
	6-10	20	25.0
	11>	26	32.5
	Total	**80**	**100.0**
Cader/Level	Managerial	12	15.0
	Officer	46	57.5
	Technician	22	27.5
	Total	**80**	**100.0**

Source: Field survey Data 2022

This section consists of the background and respondents information that describes basic attributes or characteristics such as age, gender, marital status, length of service, cadre or managerial level of the respondents. To this effect, the results are presented in Table 4.2.

Table 4.2 overleaf, presents the demographic and personal details of the respondents used for this study. Demographic and personal profile of respondents as shown in table 4.2 by age revealed that 10 respondents representing 12.5% were under 25 years of age, 36 respondents representing 45% were between 25 and 35 years of age, 26 respondents representing 32.5% were between 36 and 45 years of age and 8 respondents representing 10% were 46 years age and above. Indicating that most of the respondents were aged between 25 and 35. Furthermore, the profile of gender revealed that 22 respondents representing 27.5% were males while 58 respondents representing 72.5% were females. Indicating that most of the respondents were females. Regarding the profile of marital status, 22 respondents representing 27.5% were single while 58 respondents representing 72.5% were married. Indicating that most of the respondents were married.

Concerning length of years of service, it was observed that 10 respondents representing 12.5% were under 1 year of service, 24 respondents representing 30% were between 1 and 5 years of service, 20 respondents representing 25% were between 6 and 10 years of service and 26 respondents representing 32.5% were of 11 years of service and above. Indicating that most of the respondents have been in service for upwards of 11 years. The profile of cadre or managerial level of the respondents revealed that 12 respondents representing 15% were at managerial levels, 46 respondents representing 57.5% were at officers level while 22 respondents representing 27.5% were at technician levels. Indicating that most of the respondents were at officer levels.

4.2 Presentation and Analysis of Data of Research Question

Research Questions 1: What are the uses of Electronic Medical Record (EMR) by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos?

Table 4.3 Electronic Medical Records Uses by Respondents

	Levels of Response/Agreement				
Purpose of use EMR	**VO**	**O**	**S**	**R**	**Mean**
Use of EMR for any form of Patient Care.	52	26	2	0	3.63
	85%	35.5%	2.5%	0%	
Use of EMR for Research and Education.	15	25	29	11	2.55
	18.8%	31.2%	36.3%	13.7%	
Use of EMR for Hospital Administration Resource Allocation	22	18	30	10	2.65
	27.5%	22.5%	37.5%	12.5%	
Use of EMR for Medico-legal Activities	16	6	28	30	2.10
	20%	7.5%	35%	37.5%	
Weighted mean					**2.73**
	Levels of Response/Agreement				
Frequency of use EMR	**V O**	**O**	**S**	**R**	**Mean**
How Often Do You View EMR	56	15	5	4	3.54
	70%	18.8%	6.2%	5%	
How Often Do You Write On EMR	38	22	12	8	3.13
	47.5%	27.5%	15%	10%	
How Often Are You Required To Use EMR	54	18	8	0	3.58
	67.5%	22.5%	10%	0%	
How Often Do You Comply With Mandatory EMR Use	46	22	4	8	3.33
	57.5%	27.5%	5.0%	10%	
Weighted mean					**3.40**
Grand mean					**3.06**

Decision Rule is 3.50-4.00 = Very High, 2.50-3.49 = High, 1.50-2.49 = Low and 1.00-1.49 = Very low.
Key: VO= Very Often= Often, S= Sometimes, R= Rarely
Source: Field survey Data 2022

The results in Table 4.3 reveals a high level of necessity and demand for the use of EMR in all patient-related hospital activities (3.63) and (3.58) respectively. As regards viewing (read protocol) and documenting (write protocol) on EMR, the results indicate work-induced necessity to perform both activities in attending to patients on EMR. The results indicate a higher restriction on ability to document than on viewing based or duty schedule or role-based access (3.54) and (3.13) respectively. Compliance with mandatory utilization of EMR (3.33) was high too because the facilities visited have achieved high levels of automation/digitization that compliance becomes natural due to the accompanying benefits. Results also revealed that the

respondents agreed with the fact that EMR is integral in the facility's administration and resource allocation (2.65).

The respondents indicated that EMR was used for research and education as well as medico-legal purposes in those facilities (2.55) and (2.10) respectively. These results owe it to the fact that most health facility staff are more involved in research and education than in medico-legal matter and the latter are rare hence the relatively low results as people respond better to what they have experienced. However, the average mean score of usage of EMR is 3.06 which indicate that there are valid justifications for EMR utilization in healthcare from the outlined uses and the frequencies of use.

Results of responses indicate that 52 of the respondents (65%) used Electronic Medical Records for patient care very often, 26 (32.5%) often, 2 (2.5%) sometimes and 0 (0%) rarely as the respondents must utilize EMR to provide services. The responses had a mean value of 3.63 a strong affirmation of usage of EMR by the respondents. All these were based on their work schedule. Fifteen of the respondents (18.8%) used Electronic Medical Records for research and education very often, 25 (31.2%) often, 29 (36.3%) sometimes and 11 (13.7%) rarely with a mean value of 2.55 Research and scholarly activities are relatively fewer compared to regular duties. Twenty-two of the respondents (27.5%) used Electronic Medical Records for hospital administration and resource allocation very often, 18 (22.5%) often, 30 (37.5%) sometimes and 10 (12.5%) rarely with a mean value of 2.65. Hospital administration and resource allocation activities are reserved for managerial positions hence the response characteristics.

According to Table 4.3, respondents (20%) used Electronic Medical Records for hospital administration and resource allocation very often, 6 (7.5%) often, 28 (35%) sometimes and 30 (37.5%) rarely with a mean value of 2.10. Medico-legal activities are also reserved for managerial positions and exclusively for parties directly involved hence the response rate. People respond better to phenomenon they have knowledge and experience about that has higher frequency of occurrence. The overall weighted mean value for the purpose of use of EMR is 2.73 which according to the decision rule for mean values indicate a high EMR usage purposes by the respondents.

The frequency of usage of EMR is next to be examined. Fifty-six of the respondents (70%) view Electronic Medical Records during their work-related encounters with patients and patient care activities very often, 15 (18.8%) often, 5 (6.2%) sometimes and 4 (5%) rarely with a mean value of 3.54 a strong affirmation of viewing of EMR documentations by the respondents. Thirty-eight of the respondents (47.5%) write on Electronic Medical Records during their work-related encounters with patients and patient care activities very often, 22 (27.5%) often, 12 (15%) sometimes and 8 (10%) rarely with a mean value of 3.13 a strong affirmation of statutory requirements that the respondents contribute to the documentations contained in patients EMR documentations.

Results also indicate that 54 of the respondents (67.5%) indicated that carrying out their duties requires using Electronic Medical Records during their work-related encounters with patients and patient care activities very often, 18 (22.5%) often, 8 (10%) sometimes and none rarely with a mean value of 3.58 A strong affirmation of the near impossible nature of attending to duty

schedules without the use of EMR by the respondents. Findings revealed that, 46 of the respondents (57.5%) indicated full compliance with the mandatory use of Electronic Medical Records during their work-related encounters with patients and patient care activities very often, 22 (27.5%) often, 4 (5%) sometimes and 8 (10%) rarely with a mean value of 3.33. A strong indication of almost complete automation/digitization and affirmation of compliance to facility instructions by the respondents. The overall weighted mean value for the frequency of use of EMR is 3.40 which according to the decision rule for mean values indicate a high EMR frequency of use by the respondents. Data from respondents indicate a 3.06 grand mean on the usage of EMR. This according to the decision rule for mean values indicate an overall high usage of by the respondents.

Research Questions 2: What are the ethical issues associated with Electronic Medical Record (EMR) usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos?

Table 4.4 Ethical issues associated with Electronic Medical Records Usage by respondents

	Levels of Response/Agreement				
Confidentiality/Privacy of EMR	**SA**	**A**	**D**	**SD**	**Mean**
Possible Privacy breach or violation	36	26	8	10	3.10

	45%	32.5%	10%	12.5%	
EMR have role based access control	28	48	0	4	3.30
	35%	60%	0%	5%	
Transmission of EMR over personal unsecured network	18	32	26	4	2.80
	22.5%	40%	32.5%	5%	
EMR compliance with Consent rule	28	32	14	6	3.03
	35%	40%	17.5%	7.5%	
Weighted mean					**3.06**
	Levels of Response/Agreement				
Security EMR	**SA**	**A**	**D**	**SD**	**Mean**
EMR have Administrative Safeguards	27	47	6	0	3.26
	33.8%	58.7%	7.5%	0%	
EMR have Physical Safeguards	30	48	0	2	3.33
	37.5%	60%	0%	2.5%	
EMR have Technical Safeguards	46	32	2	0	3.55
	57.5%	40%	2.5%	0%	
Weighted mean					**3.38**
Grand mean					**3.22**

Decision Rule is 3.50-4.00 = Very High, 2.50-3.49 = High, 1.50-2.49 = Low and 1.00-1.49 = Very low.
Key: SA=Strongly Agree, A= Agree, D = Disagree and SD = Strongly Disagree.
Source: Field survey Data 2022

Regarding confidentiality/privacy the results in Table 4.4 reveals a high level of concerns and agreement that EMR use has breach/violation potentials in all patient-related hospital activities (3.10). The respondents also affirmed the inclusion of statutory role-based access controls in the EMR application (3.30). As regards sharing of part or whole EMR on unsecured personal devices among colleagues, the results indicate acceptance of such acts and concerns over consequences (2.80). The results also indicate that EMR has embedded patient consent-obtaining protocol for all uses of patient EMR (3.03)

Results on security reveal that EMR has processes or safeguards in place to ensure the safety and protection of contents of patients EMR. These protective measures are administrative, physical and technical safeguards. Results for administrative safeguards comprising creation/adoption of EMR security policies, health data security training and awareness as well as incident management protocol were (3.26), data collected on physical safeguards component of security

comprising facility access control, workstation hardware & health data security indicate acceptance of physical security measures (3.35), lastly responses regarding technical safeguards which involve measures such as automated user authentication and patient data encryption (3.55), affirmed that there are embedded technical measures to protect patient EMR content.

According to Table 4.4, 36 of the respondents (45%) strongly agreed to the vulnerability of Electronic Medical Records to possible patient violation and privacy breach, 26 (32.5%) agreed, 8 (10%) disagreed and 10 (12.5%) strongly disagreed with a mean value of 3.10. The digital and cyberspace are vulnerable to cyber-attacks and there are concerns about the consequences of such considering the sensitive nature of the data contained on patient EMR. Twenty-eight, 28 of the respondents (35%) strongly agreed to the presence of on-board role-based access control to facilitate controlled access to patients Electronic Medical Records, 48 (60%) agreed, none disagreed and 4 (5%) strongly disagreed with a mean value of 3.30. This reveals that there are different levels of access to contents of patient EMR on need-to-know-and–use basis in other to control unauthorized access and consequences. Eighteen of the respondents (22. 5%) strongly agreed to have used personal unsecured devices in the course of their duties, 32 (40%) agreed, 26 (32.5%) disagreed and 4 (5%) strongly disagreed with a mean value of 2.80. Personal devices like phones that lack standardized firewalls are a threat to the network and content of patient EMR as the can be stolen or sabotaged easily.

Furthermore, 28 of the respondents (35%) strongly agreed that EMR has embedded in it the necessary consent protocol for all patient care activities, 32 (40%) agreed, 14 (17.5%) disagreed and 6 (7.5%) strongly disagreed with a mean value of 3.03. Consent procedures are embedded, compliance is a different ball game as digitization offers too many options. The overall weighted mean value for the ethical issues associated with EMR usage is 3.06 which according to the

decision rule for mean values register a high potential for confidentiality/privacy breaches using EMR by the respondents.

As regards security of electronic medical records, 27 of the respondents (33.8%) strongly agreed that EMR has enough administrative safeguards to protect legitimate users in all healthcare related activities, 47 (58.7%) agreed, 6 (7.5%) disagreed and none strongly disagreed with a mean value of 3.26. administrative measures like policies, training, awareness and disciplinary measures all abound.

Results reveal that 30 of the respondents (37.5%) strongly agreed that EMR has physical safeguards to protect the facility from unauthorized access to and use of its hardware, 48 (60%) agreed, none disagreed and 6 (7.5%) strongly disagreed with a mean value of 3.33. Physical safeguards are protections easily related to as everyone recognizes door locks, security officials etc. Forty-six of the respondents (57.5%) strongly agreed that EMR has technical safeguards to protect legitimate users in all healthcare related activities, 32 (40%) agreed, 2 (2.5%) disagreed and none strongly disagreed with a mean value of 3.55. Technical security measures like firewalls, automated authentications, encryptions etc. are all embedded. The overall weighted mean value

regarding the security of EMR 3.38 which according to the decision rule for mean values indicate a high EMR usage purposes by the respondents. Data from respondents indicate a 3.22 grand mean on ethical issues and challenges experienced in the usage of EMR. This according to the decision rule for mean values indicate an overall high concern for EMR content protection by the respondents.

Research Questions 3: What are the perceived usefulness of Electronic Medical Record (EMR) among Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos?

Table 4.5
Perceived Usefulness of Electronic Medical Records by respondents

	Levels of Response/Agreement				
Time-Saving	**SA**	**A**	**D**	**SD**	**Mean**
Using EMR enables HIM Professional to accomplish tasks more quickly.	58 72.5%	20 25%	0 0%	2 2.5%	3.68
Using EMR in service delivery will increase productivity of HIM Professional.	38 47.5%	40 50%	0 0%	2 2.5%	3.43
EMR timeliness in service delivery is most adequate in emergency situations to HIM Professional.	38 47.5%	38 47.5%	2 2.5%	2 2.5%	3.40
Weighted mean					**3.50**
	Levels of Response/Agreement				
Effort Saving	**SA**	**A**	**D**	**SD**	**Mean**
Using EMR improves the job performance of HIM Professional.	56 70%	22 27.5%	0 0%	2 2.5%	3.68
Using EMR will reduce duplication of procedures or actions of HIM Professional.	46 57.5%	28 35%	4 5%	2 2.5%	3.50
Using EMR will reduce effort and increase positive outcomes.	52 65%	22 27.5%	4 5%	2 2.5%	3.55
Weighted mean					**3.58**

Decision Rule is 3.50-4.00 = Very High, 2.50-3.49 = High, 1.50-2.49 = Low and 1.00-1.49 = Very low.
Key: SA=Strongly Agree, A= Agree, D = Disagree and SD = Strongly Disagree.
Source: Field survey Data 2022

	Levels of Response/Agreement				
Cost-Effectiveness	**SA**	**A**	**D**	**SD**	**Mean**
Using EMR will reduce overall cost	10 12.5%	26 32.5%	26 32.5%	18 22.5%	2.35
Using EMR will reduce wastages	30 37.5%	46 57.5%	2 2.5%	2 2.5%	3.30
Using EMR will facilitate better cost regulations	32 40%	30 37.5%	8 10%	10 12.5%	3.05

Weighted mean	**2.90**

Overall Usefulness	Levels of Response/Agreement SA	A	D	SD	Mean
Using EMR improves safety of healthcare	42 52.5%	30 37.5%	6 7.5%	2 2.5%	3.40
EMR is fit for Healthcare practice	50 62.5	28 35%	0 0%	2 2.5%	3.60
EMR promotes availability and adequacy of Healthcare service delivery	40 50%	30 37.5%	8 10%	2 2.5%	3.35
Weighted mean					**3.45**
Grand mean					**3.06**

Decision Rule is 3.50-4.00 = Very High, 2.50-3.49 = High, 1.50-2.49 = Low and 1.00-1.49 = Very low.
Key: SA=Strongly Agree, A= Agree, D = Disagree and SD = Strongly Disagree.
Source: Field survey Data 2022

Regarding perceived usefulness of EMR, the results in table 4.5 reveals that the respondents agree that EMR enables HIM Professional to accomplish tasks more quickly (3.68). The respondents also affirmed that using EMR in service delivery will increase productivity of HIM Professionals (3.43). As regards timeliness, the respondents agreed that EMR timeliness in service delivery is most adequate in emergency situations to HIM Professionals (3.40). Results on performance indicate that EMR improves the job performance of HIM Professionals (3.68). Results on the ability of EMR to enhance the job effectiveness of HIM Professional were positive(3.50), data collected on ability of EMR to reduce effort and increase positive outcomes. (3.55). Responses on EMR wastage reduction capabilities were positive (3.30). Results on EMR will facilitating better cost regulations were (3.05) as it will ensure uniformity of standards and elimination of personal bias. Data collected on the ability of EMR to improve safety of healthcare (3.40). As regards technology-task fitness, respondents agreed that EMR technology is fit for Healthcare Practice (3.60), lastly responses regarding EMR promoting availability and adequacy of healthcare service delivery (3.35), are in the affirmative. Results shows that 58 of

the respondents (72.5.%) strongly agreed that using EMR enables HIM Professionals to accomplish all healthcare related activities tasks faster, 20 (25%) agreed, none disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.68. As regards EMR positive influence on productivity, 38 of the respondents (47.5.%) strongly agreed that using EMR in service delivery will increase productivity of HIM Professional, 40 (50%) agreed, none disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.43. Furthermore, 38 of the respondents (47.5.%) strongly agreed that the EMR timeliness in service delivery is most adequate in emergency situations to HIM Professionals, 38 (47.5%) agreed, 2 (2.5%) disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.40. The overall weighted mean value of 3.50 according to the decision rule for mean values indicates a high regards for the speed and timeliness of EMR by the respondents.

Results reveal that 56 of the respondents (70%) strongly agreed that using EMR improves the job performance of HIM Professionals, 22 (27.5%) agreed, none disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.68. In item 20, 46 of the respondents (57.5.%) strongly agreed that using EMR would enhance the job effectiveness of HIM Professionals, 28 (35%) agreed, 4 (5%) disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.50. According to findings, fifty-two 52 of the respondents (65%) strongly agreed that using EMR will reduce effort and increase positive outcomes, 22 (35%) agreed, 4 (5%) disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.55. The overall weighted mean value of 3.58 according to the decision rule for mean values indicates a high effort-saving, performance and efficiency capabilities of EMR by the respondents. Responses indicate that 10 of the respondents (12.5.%) strongly agreed that using EMR will reduce overall cost, 26 (32.5%) agreed, 26 (32.5%)

disagreed and 18 (22.5%) strongly disagreed with a mean value of 2.35. Respondents disagreed with the assumption that EMR will reduce overall cost factoring in the cost of power generation, technology and equipment, skill acquisition etc. Also, 30 of the respondents (37.5.%) strongly agreed that using EMR will reduce wastages, 46 (57.5%) agreed, 2 (2.5%) disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.30. this is due to the fact that everyone is specifically held responsible and accountable for their various roles and actions on EMR.

Thirty-two of the respondents (40%) strongly agreed that using EMR will facilitate better cost regulations, 30 (37.5%) agreed, 8 (10%) disagreed and 10 (12.5%) strongly disagreed with a mean value of 3.05. It will minimize or possibly eliminate billing, revenue and expenditures errors and bias on EMR. The overall weighted mean value of 2.90 according to the decision rule for mean values indicates a high cost-effectiveness potential of EMR by the respondents. Results also shows that 42 of the respondents (52.5.%) strongly agreed that using EMR improves safety of healthcare, 30 (37.5%) agreed, 6 (7.5%) disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.40. It will minimize or possibly eliminate billing, revenue and expenditures errors and bias on EMR. Fifty of the respondents (62.5.%) strongly agreed that using EMR improves safety of healthcare, 28 (35%) agreed, none disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.60. It will ensure compliance to approved standards and raise red flags when standards are not met as well as hold professionals accountable on EMR. Findings also revealed that 40 of the respondents (50%) strongly agreed that using EMR promotes availability and adequacy of healthcare service delivery, 30 (37.5%) agreed, 8 (10%) disagreed and 2 (2.5%) strongly disagreed with a mean value of 3.35. The overall weighted mean value of 3.45 according to the decision rule for mean values indicates a high score in overall usefulness of

EMR by the respondents. Data from respondents indicate a 3.06 grand mean on the perceived usefulness experienced in the usage of EMR. This according to the decision rule for mean values indicate an overall high acceptance that EMR is fit and useful in healthcare practice by the respondents.

4.3 Presentation of Test of Hypotheses

The following null hypothesis was tested at 0.05 level of significance.

$H_0$1 There is no significant influence of ethical practices (Confidentiality/Privacy and Security) on Electronic Medical Records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.

Table 4.6: **Summary of Result of Influence of Ethical Practices (Confidentiality/Privacy and Security) on Electronic Medical Records Usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos.**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.391[a]	.153	.142	.497

a. Predictors: (Constant), Ethical_Practices

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.474	1	3.474	14.055	.000[b]
	Residual	19.276	78	.247		
	Total	22.750	79			

a. Dependent Variable: Use_of_EMR
b. Predictors: (Constant), Ethical_Practices

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.191	.074		2.578	.012
	ethical_practices	.204	.055	.391	3.749	.000

a. Dependent Variable: Use_of_EMR

Table 4.6 measures the influence or otherwise of ethical practices (Confidentiality/Privacy and Security) on Electronic Medical Records usage by Health Information Management Professional. The model shows a R score of 0.391 with an Adjusted R^2 of 0.142 indicating that ethical practices (Confidentiality/Privacy and Security) accounts for 14.2% variation in the usage of EMR. In addition, the results of ANOVA test revealed that ethical practices (Confidentiality/Privacy and Security) have a significant effect on EMR usage. This can be explained by the F-value (14.055) and low p-value (0.000) which is statistically significant at 95% confidence interval.

From the data presented in the coefficient table, it can be seen that ethical practices (Confidentiality/Privacy and Security) (ß=0.204, t=3.749, $p<0.05$) has a significant statistical

value which indicates that ethical practices (Confidentiality/Privacy and Security) has a positive influence on EMR usage by Health Information Management Professionals. This means that ethical practices (Confidentiality/Privacy and Security) are of great concern in the usage of EMR technology due to the vulnerabilities of the internet and digital media. The undesired potential negative incidents call for more robust measures to guarantee protection of patients and contents of their medical records. The null hypothesis which states that there is no significant influence of ethical practices (Confidentiality/Privacy and Security) on Electronic Medical Records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos, is therefore rejected.

$H_0$2 There is no significant influence of perceived usefulness of Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos

Table 4.7: **Summary of Result of Influence of Perceived Usefulness of Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall**

usefulness) on Electronic Medical records usage by Health Information Management Professionals in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.357[a]	.127	.116	.505

a. Predictors: (Constant), Perceived_Usefulness

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.893	1	2.893	11.363	.001[b]
	Residual	19.857	78	.255		
	Total	22.750	79			

a. Dependent Variable: Use_of_EMR
b. Predictors: (Constant), Perceived_Usefulness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.516	.070		7.346	.000
	Perceived_Usefulness	-.269	.080	-.357	-3.371	.001

a. Dependent Variable: Use_of_EMR

Table 4.7 measures the influence or otherwise of perceived usefulness of Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professionals. The model shows a R score of 0.357 with an Adjusted R^2 of 0.116 indicating that perceived usefulness of Electronic Medical Records accounts for 11.6% variation in the usage of EMR. In addition, the results of ANOVA test revealed that perceived usefulness of Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) have a significant effect on EMR usage. This can be explained by the F-value (11.363) and low p-value (0.001) which is statistically significant at 95% confidence interval.

From the data presented in the coefficient table, it can be seen that perceived usefulness of Electronic Medical Records (ß=0.269, t=-3.371, $p<0.05$) has a significant statistical value which indicates that perceived usefulness of Electronic Medical Records has a positive influence on EMR usage by Health Information Management Professionals. This means that perceived usefulness of Electronic Medical Records are of great impact on the usage of EMR technology as perception goes a long way to influence acceptance. Negative perception creates resistance to use whereas positive perception facilitates acceptance of the application. Acceptance or rejection depends largely on the convictions of the fitness of the app to meet with the requirements of the healthcare industry. The null hypothesis which states that there is no significant influence of perceived usefulness of EMR on Electronic Medical Records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos, is therefore rejected.

$H_0$3 There is no combined influence of ethics (Confidentiality/Privacy and Security) and perceived usefulness Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos

Table 4.8: **Summary of Result of Influence of Ethical Practices (Confidentiality/Privacy and Security) and Perceived Usefulness Electronic Medical Records (Timeliness, Effort Saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.535[a]	.286	.267	.459

a. Predictors: (Constant), Ethical_Practices, Perceived_Usefulness

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6.501	2	3.251	15.403	.000[b]
	Residual	16.249	77	.211		
	Total	22.750	79			

a. Dependent Variable: Use_of_EMR

b. Predictors: (Constant), Ethical_Practices, Perceived_Usefulness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.332	.078		4.260	.000
	Ethical_Practices	.208	.050	.398	4.135	.000
	Perceived_Usefulness	-.275	.073	-.365	-3.788	.000

a. Dependent Variable: Use_of_EMR

Table 4.8 measures the results of the linear combination test of influence of ethics (Confidentiality/Privacy and Security) and perceived usefulness Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professionals. The model shows a R score of 0.535 with an Adjusted R^2 of 0.267 indicating that ethical practices and perceived usefulness of EMR have impact on Electronic Medical Records usage by Health Information Management Professional accounts for 26.7% variation in the usage of EMR. In addition, the results of ANOVA test revealed that ethical practices (Confidentiality/Privacy and Security) and perceived usefulness Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professionals have a significant effect on EMR usage. Also, from the coefficient table, it can be seen that both ethical practices and perceived usefulness of EMR have statistical significance and impact on Electronic Medical Records usage by Health Information Management Professional (ß=0.208, t=4.135, $p<0.05$ is the significant predictors of ethical practices and (ß=0.275, t=5.788, $p<0.05$ perceived usefulness of EMR have impact on Electronic Medical Records usage by Health Information Management

Professionals. This means that, there is a significant joint influence of both ethical practices and perceived usefulness on the usage of EMR by Health Information Management Professional in National Orthopaedic Hospital, Igbobi, Lagos and Federal Neuro-Psychiatric Hospital, Yaba, Lagos. The null hypothesis which states that there is no combined influence of ethical practices and perceived usefulness on EMR usage is therefore rejected.

4.3 Discussion of Findings

The analysis data in this chapter in line with the research questions and hypotheses has led to findings which are discussed as follows;

The first research question focus on finding out the polarity of the impact of ethical practices especially as it bothers on confidentiality/privacy and security on the usage of EMR by Health Information Management Professional in federal health facilities utilizing EMR in Lagos State . The results show that there are reservations and concerns about the confidentiality/privacy and security of contents of patients medical records is 3.10 which reveals that there is an acceptance of the presence of potential privacy dangers and that there are palpable fears about the safety of the sensitive contents of EMR. While basic and relevant measures have been incorporated into the EMR application, the human factor remains an issue because fraternity still allow people to share log-in details, cover duties for each other and use personal digital devices that are protection-deficient (easily hackable) and can also be stolen because of its mobile nature unlike the terminal permanently domiciled within the facility with adequate physical, administrative and technical security which to an extent jeopardizes computerized authentication processes. It was discovered that multi-stage security measures are often intrinsic parts of an EMR applications as evidenced by the 97.5%, 92.5% and 97.5% results agreements by the respondents for physical,

administrative and technical safeguards respectively but strict compliance and enforcement seems to be lacking at all three levels.

Being ICT driven with palpable skill set insufficiency, sensitive health data of patients are sometimes being handled by support staff which is a huge risk. The application sometimes allow for an overlap of functions thereby exposing details that are otherwise supposed to be on a need-to-know basis which increases the potentials of unauthorized access and breach of privacy. The sharing of authentication details among friends or communal viewing of EMR terminals make nonsense of the role-based-access-control RBAC protocol. Scholars have emphasized the need for strict security measures especially as it relates to the confidentiality/privacy of contents of patients medical records and to strictly limit or even eliminate the involvement of third parties in handling such sensitive data[1].

It is important to note that the fact that EMR reduces certain functions to just clicks on the keyboard, due consent must be obtained and not imposed on the patient because it is just a click away especially when it relates with release of identifiable contents of the patients EMR[2]. This will go a long way to promote confidence in the use of the application. Patients don't want their health data out there in unsafe hands and health facilities do not want privacy breach litigations. Assurance of solid confidentiality/privacy facilitates trust between care-giver and care receiver, it makes the patient to be forthcoming in giving truthful responses to aid effective and efficient therapy.[3]. Researchers have found that EMR have internet and digital media technological vulnerabilities as well as human factor security issues and have proffered numerous possible mitigations of such activities. These include firewall and encryption protocols on the technological aspect and policies for training and discipline on the human factor aspect[4,5].

The second research question focus on the impact of perceived usefulness on the usage of EMR by Health Information Management Professional in federal health facilities utilizing EMR in Lagos State. The results show that there are positive perceptions about the outcome of the utilization of EMR in patient care as seen the response mean of 3.30 which reveals that there is an acceptance that the technology is adequate for medical practice and will offer certain advantages and incentives over traditional manual methods[6]. These advantages include speed which allows caregivers to accomplish more in a timely manner, safety which ensures compliance to standards and restrictions to harmful outcomes, comprehensive and cost-effective care which offers a level playing field for costings and billings without errors or bias while ensuring accountability for all activities[6,7].

The usefulness of EMR applications are lucid in timeliness, safer and cost-effective therapy outcomes, increased performance, productivity and task achievements. However, there are schools of thoughts that opined that there are issues that negatively impact the adoption of EMR. These include the very huge capital investment in a resource-constrained sector, technological insufficiency in personnel skill sets, hard/software, Power (electricity). Scholarly investigations have revealed that many facilities had adopted and deployed EMR but failed within a year due to different reasons bothering on lack of adequate planning (financial, educative, administrative, technological, etc.). EMR to reach its full potentials require multi-interoperability with divers systems with different configurations and handling different data formats, training and retraining, periodic upgrades, a lot of financial investments among others to function. These factors pose a major threat and concern to the adoption and deployment of EMR as it is concurrent and not a one-off thing[8,9].

The third research question focus on the combined impact of ethical practices particularly as it affects confidentiality/privacy and perceived usefulness on the usage of EMR by Health Information Management Professional in federal health facilities in Lagos State. The variables have all been afore discussed and this research question focuses on the amalgamation of the individual impacts of the variables on EMR usage. The results indicate an established impact of the combined influence of ethical practices and perceived usefulness of EMR usage. Whereas individually, they have 11.6% and 14.2% positive variations respectively on the usage of EMR, there combined influence registers a 26.7% variation showing that there is increased influence on EMR usage when both predictor variables are combined. It literally means that any EMR application that has both confidentiality/privacy and perceived usefulness inadequacies would be a misfit with more likelihood of rejection and failure than any other EMR application that has only one of them as an issue[10,11].

No facility wants to waste scarce resources on failed projects. The basic focus of facilities to the adoption and subsequent deployment of EMR applications lies in the justification that it is needed, that it is fit for medical care, it respects patients autonomy and privacy[12]; improves or facilitates desired outcomes, is affordable safe and timely[13]. Whenever any of these are lacking, it is suggestive of a deficient EMR application, a poorly implemented technology or a combination of both. This situation is what every facility strives to avoid by engaging a comprehensive analysis of the customized services they provide and the demands that the EMR applications need to meet with extensive room for future upgrades as necessity demands bearing sustainability and affordability in mind[13].

Results from data collected in the course of this work indicate that there is significant influence of ethical practices (Confidentiality/Privacy and Security) on Electronic Medical Records usage by Health Information Management Professionals. The results align with previous scholarly work where all stakeholders expressed confidentiality and security concerns about EMR usage[3,14] and validate concerns about the vulnerabilities of digital/electronic and online platforms. An R score of 0.391 with an Adjusted R^2 of 0.142 indicating protection concerns of Electronic Medical Records accounts for 14.2% variation in the usage of EMR, F-value (14.055) and low p-value (0.000) which is statistically significant at 95% confidence interval indicate that apart from the many benefits of usage, there are confidentiality/privacy and security concerns on the use of Electronic Medical Records . This is also evidently reflected in the confidentiality/privacy and security weighted means response values of 3.06 and 3.38 respectively. Summarized by a grand mean of 3.22.

Responses indicate that there is significant influence of perceived usefulness of Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on EMR usage by Health Information Management Professionals. The results agree with previous literature showing direct improvement in performance, efficiency, effectiveness, safety etc. [11, 13, 15, 16]. An R score of 0.357 with an Adjusted R^2 of 0.116 indicating that perceived usefulness of Electronic Medical Records accounts for 11.6% variation (improvement) in the usage of EMR, F-value (11.363) and low p-value (0.001) which is statistically significant at 95% confidence interval indicates that perceived usefulness of Electronic Medical Records has a positive influence on EMR usage. The responses authenticate the adequacy of EMR in healthcare with weighted means response values of 3.50, 3.58, 2.90 and

3.38 for timeliness/speed, efficiency/effectiveness, cost-effectiveness and overall usefulness respectively. Summarized by a grand mean of 3.06.

Data collected to test the third hypothesis for combined effect of ethical practices and perceived usefulness shows that there is combined influence of ethics (Confidentiality/Privacy and Security) and perceived usefulness Electronic Medical Records (Timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) on Electronic Medical records usage by Health Information Management Professionals yielded an R score of 0.535 with an Adjusted R^2 of 0.267 indicating that perceived usefulness of Electronic Medical Records accounts for 26.7% variation (improvement) in the usage of EMR, F-value (15.403) and low p-value (0.000) which is statistically significant at 95% confidence interval indicates that ethical practices and perceived usefulness of Electronic Medical Records have a combined influence on EMR usage.

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Chapter Five

Conclusion

This chapter discusses the summary of findings, conclusions and recommendations, contributions to knowledge and suggestions for further studies.

5.1 Summary of Findings

The main objective of this study is to examine the influence of ethical practices and perceived usefulness on the use of EMR by health information management professionals in federal hospitals in Lagos State, Nigeria. The following are the summary of the findings:

1. The use of electronic medical records by the respondents is high. This implies that Health Information Management Professionals in federal tertiary hospitals in Lagos State, Nigeria utilize Electronic Medical Record (EMR) in the execution of their duties to improve the performance and efficiency of healthcare services in federal tertiary hospitals in Lagos state, Nigeria.

2. It is established that there are high ethical issues (confidentiality/privacy and security) associated with the use of EMR by Health Information Management Professional due to human factors and the vulnerabilities of online/digital data in federal hospitals in Lagos state, Nigeria.

3. Electronic Medical Record has high perceived usefulness and benefits (timeliness, effort saving, improved quality and safety, cost reducing, and overall usefulness) to Health Information Management Professional by improving service quality, delivery and outcomes (efficacy) in federal hospitals in Lagos state, Nigeria.

4. Ethical practices (confidentiality/privacy and security) have significant influence on the use of electronic medical records by health information management professionals in federal hospitals in Lagos state, Nigeria.

5. Perceived usefulness (timeliness, effort-saving, cost-effectiveness and overall usefulness) have significant influence on the use of electronic medical records by health information management professionals in federal hospitals in Lagos state, Nigeria.

6. There is significant combined influence of Ethical practices and Perceived usefulness on the use of electronic medical records by health information management professionals in federal hospitals in Lagos state, Nigeria.

5.2 Conclusions

In line with the literature and theories reviewed in this study, ethical practices (confidentiality/privacy and security) and perceived usefulness (time-saving, effort-saving, cost effectiveness and overall usefulness) of EMR are vital determinants of the successful use of EMR application in the facilities investigated. With the investigation of these two predictor variables, It is believed that they enhance the acceptability or rejection and ultimate outcome of EMR use. Based on the empirical findings, this study concluded that there is statistically significant influence of ethical practices and perceived usefulness on the use of electronic medical records by health information management professionals in federal hospitals in Lagos state, Nigeria.

The level of compliance to ethical practices standards depend largely on confidentiality/privacy education and awareness, training and re-training as the challenges have human and non-human factors which are administrative, physical and technological. Lastly, the perception of the capabilities of the EMR application to meet with dynamic demands of the health sector without conflicts of interests determines its acceptance or rejection. It is therefore concluded that EMR

applications are heavily pimped to be healthcare's ultimate solution but any deficiency in the two predictor variables directly results in the rejection and failure of usage of the EMR application hence adequate evaluation must be carried out.

5.3 Recommendations

Based on the findings in this study, the following recommendations were made.

1. Health Information Management Professionals from the findings of this work, should be encouraged to use electronic medical records to better manage clinical data to improve the performance and efficiency of healthcare services in federal hospitals in Lagos state, Nigeria.

2. The confidentiality/privacy and security challenges associated with the use of EMR by Health Information Management Professional can be mitigated through strict confidentiality policies, improved technical configurations to mitigate vulnerabilities of online/digital data, regular privacy education and awareness to avoid fraternal use of log-in credentials and enforcement of disciplinary measures as deterrent to potential violators. in federal hospitals in Lagos state, Nigeria.

3. According to the findings of this work, electronic medical records has perceived usefulness and these benefits or advantages which include effort saving, timeliness, cost-effectiveness, enhanced safety and overall usefulness should be harnessed to improve or enhance healthcare services delivery

4. From the results of the findings, perceived usefulness of EMR have significant influence on the use of EMR by the respondents. It is very necessary that the management of these

facilities sustain emphasis on the usefulness of EMR which positively influences the desire to use EMR by Health Information Management Professionals in federal hospitals in Lagos state, Nigeria.

5. Based on the results of the findings, ethical practices (confidentiality/privacy and security) have significant influence on the use of EMR by health information management professionals in federal hospitals in Lagos state. It is important that the management of these facilities engage in regular comprehensive ethical practices (confidentiality/privacy and security) education and awareness of the respondents to compel ethical compliance and enlighten them on their responsibilities and consequences of privacy breach in the use of EMR

6. The study deduced that there is significant combined influence of Ethical practices and Perceived usefulness on the use of EMR by the respondents. It is recommended that managements of these facilities should apply commensurate caution and set up adequate counter measures to mitigate consequences of privacy breach while maximizing the harnessing of the potentials or advantages of EMR

5.4 Contribution to knowledge

This work has added to local, regional, continental and global repository of knowledge in diverse ways, namely but not limited to the following. Empirically, this work has added recency by adding to recent literature on the interaction and influences of ethical practices and perceived usefulness of on the usage of EMR specifically in Lagos State and Nigeria at large. Though

studies conducted on technology and its impact in the healthcare sector of developed climes abound, empirical studies from developing countries like Nigeria are relatively few. There are documented facts on either confidentiality/privacy or perceived usefulness as individual predictor variables on the use of EMR in other climes but very few local content and even fewer addressed the combined influence of both on EMR use. This means that much is not documented about the combined effect of ethical practices and perceived usefulness of on the usage of EMR among health information management professionals in Lagos State, Nigeria, hence this work contributes to bridge the gap.

This work has isolated ethical practices and perceived usefulness among other predictor variables and narrowed down the number of predictor factors impacting EMR use that are yet to be investigated (stand-alone or combined). Moreover, the study provides findings which future scholars can use to buttress empirical submissions in their studies. Overall, the above mentioned emphasizes the fact that this study offers significant contribution to knowledge and has practical applications or implications to health information management professionals on the management of usage of EMR in facilities investigated and aligns with other similar studies.

5.5 Suggested Areas of Further Research

This focused on the influence of ethical practices and perceived usefulness on the usage of EMR by health information management professionals in federal hospitals in Lagos State, Nigeria. Nevertheless to broaden the frontiers and horizon of knowledge, the following areas of studies are suggested for further research.

1. The present study was carried out on health information management professionals at two federal health facilities that utilize EMR application in Lagos State, Nigeria, further studies can as well be extended to include State and private-owned health facilities to comparatively examine their different practice experiences.

2. Further studies can be done to expand the respondents to include all healthcare workers and not limiting it to health information management professionals or only federal health facilities that utilize EMR application or limiting it to Lagos State alone

3. Comparative studies involving other African countries may be considered to compare experiences, challenges and solutions.

4. Other factors that affect EMR adequacy such as structuring, designs and programming languages may be investigated in the future as determinants of how EMR functionality and performance including confidentiality/privacy and perceived usefulness are measured

5. Studies in the area of interoperability and the seamless harnessing of potentials of different programs and formats at single and integrated sites levels for better health facility intra/inter collaborations in government or private owned primary, secondary or tertiary health.

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Department of Information Management
Faculty of Communication and Information Science
Lead City University

Ethical Practices, Perceived Usefulness and Usage of Electronic Medical Record by Health Information Management Professionals in Federal Hospitals in Lagos State, Nigeria

Dear Respondent,
I am Edozie O.A, a Postgraduate degree student of the above named Department. I seek your indulgence to help fill this questionnaire to the best of your ability. Your response is strictly confidential and will be used only for research purpose.

Thanks

Section A: Demographic Information
Instructions: please indicate your options to the following statements by ticking ( ) in the appropriate boxes provided.

a. **Age:** Below 25 yrs ☐ 25- 35 yrs ☐ 36- 45 yrs ☐ 46 yrs & above ☐

b. **Sex:** Male ☐ Female ☐

c. **Marital Status:** Single ☐ Married ☐

d. **Length of Service:** Below 1 yr ☐ 1- 5 yrs ☐ 6- 10 yrs ☐ 11yrs + ☐

e. **Cader/Level:** Managerial ☐ Officer ☐ Technician ☐

Section B: Usage Of Electronic Medical Records
Instructions: please indicate your options to the following statements by ticking ( ) in the appropriate boxes provided.
VO(Very Often), O(Often), S(Sometimes), R(Rarely)

Item No.	Variables	VO	O	S	R
	Purpose Of Use Of Electronic Medical Records				
1	Use of EMR for any form of Patient Care.				
2	Use of EMR for Research and Education.				
3	Use of EMR for Hospital Administration Resource Allocation				
4	Use of EMR for Medico-legal Activities				
	Frequency Of Use Of Electronic Medical Records				
5	How Often Do You View EMR				
6	How Often Do You Write On EMR				
7	How Often Are You Required To Use EMR				
8	How Often Do You Comply With Mandatory EMR Use				

SECTION C: Ethical Practices Scale

The ethical challenges of the use of EMR by Health Information Management Professional at NOHI Lagos

Instructions: please indicate your options to the following statements by ticking ( ) in the appropriate boxes provided.

SA(Strongly Agree), A(Agree), D(Disagree), SD(Strongly Disagree)

No.	Confidentiality/Privacy	SA	A	D	SD
9	Patient privacy have potentials of possible breach or violation due to multi-user features of Electronic Medical Records.				
10	There are role based accesses to patient records for every staff in the health facility as a protective measure to patients Electronic Medical Records.				
11	Whole or parts of patients Electronic Medical Records are sent over personal unsecured network among care providers				
12	Consent for all uses of Electronic Medical Records has been communicated to the patient and fully implemented as ethics demands				
	Security				
13	Electronic Medical Records has Administrative Safeguards like adoption of security policies and procedures, health data security awareness & training and incident procedures				
14	Electronic Medical Records has Physical Safeguards such as facility access control, workstation hardware & health data security.				
15	Electronic Medical Records has Technical Safeguards such as Automated User Authentication and Patient Data Encryption				

Section D: Perceived Usefulness Of Electronic Medical Records

The perceived usefulness of the use of EMR by Health Information Management Professional at NOHI Lagos

Instructions: please indicate your options to the following statements by ticking ( ) in the appropriate boxes provided.

SA(Strongly Agree), A(Agree), D(Disagree), SD(Strongly Disagree)

No.	Variables	SA	A	D	SD
	Time-Saving/Speed & Output				
16	Using Electronic Medical Records on the job enables Health Information Management Professional to accomplish tasks more quickly.				
17	Using Electronic Medical Records in service delivery will increase productivity of Health Information Management Professional.				
18	Electronic Medical Records timeliness in service delivery is most adequate in emergency situations to Health Information Management Professional.				
	Performance, Efficiency & Effort Saving				
19	Using Electronic Medical Records improves the job performance of Health Information Management Professional.				
20	Using Electronic Medical Records would enhance the efficiency and effectiveness on the job of Health Information Management Professional.				
21	Using Electronic Medical Records will reduce effort and increase positive outcomes.				
	Cost-effectiveness				
22	Using Electronic Medical Records will reduce overall cost				
23	Using Electronic Medical Records will reduce wastages				
24	Using Electronic Medical Records will facilitate better cost regulations				
	Overall Usefulness				
25	Using Electronic Medical Records improves safety of healthcare				
26	Electronic Medical Records is fit for Healthcare practice				
27	Electronic Medical Records promotes availability and adequacy of Healthcare service delivery				

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Lead City University, Ibadan

Motto: Knowledge for Self-reliance

Beside Methodist High School, Oba Otudeko Avenue Toll Gate
PO Box 30678, Secretariat Ibadan. Tel: 08153318702
E-mail: leadcity@lcu.edu.ng www.lcu.edu.ng

5th August, 2022

The Medical Director,
National Orthopaedic Hospital,
Igbobi, Lagos

Dear Sir/Madam,

LETTER OF INTRODUCTION

I write to introduce **EDOZIE Obiorah Anthony** M.Sc student of the Department of Information Management who is currently working on his Thesis. He is in the process of gathering data for his Master's Degree which is "Ethical Practices, Perceived Usefulness and Usage of Electronic Medical Record."

We hereby appeal for your cooperation in this regard. Kindly note that the information collected is strictly for research purpose.

Thank you in anticipation of your kind consideration.

Yours faithfully,

LEAD CITY UNIVERSITY, IBADAN.
HEAD OF DEPARTMENT
DEPARTMENT OF INFORMATION MANAGEMENT
5/7/2022

Dr. T. E. Aderonkan
Head of Department SIGN DATE

Lead City University, Ibadan

Motto: Knowledge for Self-reliance

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5th August, 2022

The Medical Director,
Federal Neuro-Psychiatric Hospital,
Yabai, Lagos

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Yours faithfully,

LEAD CITY UNIVERSITY, IBADAN.
HEAD OF DEPARTMENT
DEPARTMENT OF INFORMATION MANAGEMENT
5/7/2022

Dr. T. E. Adenekan
Head of Department SIGN DATE

Lead City University, Ibadan
Faculty of Communication and Information Sciences
Department of Information Management

Dear Sir/Madam,

Research Project Attestation Form

The bearer is a student of the above name University and Department. He/she is conducting a research and your establishment has been selected as one of his/her research sample. Kindly grant him/her all necessary assistance to make the exercise a success.

Please complete the following attestation form for the student on completion of the exercise. The completion of the form serves as evidence that the student actually carried out part of the work in your establishment.

Thanks for your anticipated assistance.

LEAD CITY UNIVERSITY, IBADAN
HEAD OF DEPARTMENT
DEPARTMENT OF INFORMATION MANAGEMENT
5/7/2022
SIGN

Head of Department (Signature, Date and Stamp)

Student's (Researcher) Surname: EDOZIE **Other Names** Obiorah Anthony
Matriculation Number: LCU/PG/0002061 **Programme:** HIM
Project Topic: Ethical Practices, Perceived Usefulness and Usage of Electronic Medical Record.

Attestation Section
I hereby attest that the above named student conducted a study on the above named topic in my institution/establishment

Date(s) (Days) the Research was Conducted... 22nd – 25th August 2022
Names of Attester... Mr. Abimbola Samuel... Designation... Asst. Director
Name and Address of the Institution... National Orthopaedic Hospital Lagos
Phone No. 08024111792 ..... E-mail Address: abimbolabenjamin@gmail.com

Signature, Date and Stamp

NATIONAL ORTHOPAEDIC HOSPITAL
Date 25/8/22
IGBOBI LAGOS

Lead City University, Ibadan
Faculty of Communication and Information Sciences
Department of Information Management

Dear Sir/Madam,

Research Project Attestation Form

The bearer is a student of the above name University and Department. He/she is conducting a research and your establishment has been selected as one of his/her research sample. Kindly grant him/her all necessary assistance to make the exercise a success.

Please complete the following attestation form for the student on completion of the exercise. The completion of the form serves as evidence that the student actually carried out part of the work in your establishment.

Thanks for your anticipated assistance.

LEAD CITY UNIVERSITY
HEAD OF DEPARTMENT
DEPARTMENT OF INFORMATION MANAGEMENT
SIGN

5/7/2022
Head of Department (Signature, Date and Stamp)

Student's (Researcher) Surname: EDOZIE **Other Names** Obiorah Anthony
Matriculation Number: LCU/PG/0002061 **Programme:** HIM
Project Topic: Ethical Practices, Perceived Usefulness and Usage of Electronic Medical Record.

Attestation Section
I hereby attest that the above named student conducted a study on the above named topic in my institution/establishment

Date(s) (Days) the Research was Conducted 13/9/2022
Names of Attester Alfred-Esejobor OB Designation H-O.D
Name and Address of the Institution FNPH YABA LAGOS
Phone No 08055619032 E-mail Address: mummyfmns23@gmail.com

FEDERAL NEURO-PSYCHIATRIC HOSPITAL YABA LAGOS

Signature, Date and Stamp
13/9/2022

Biodata

Personal Data

Full Name:	Obiorah Anthony EDOZIE
Address:	National Orthopaedic Hospital, Lagos.
E-mail Address:	tonero00777@gmail.com
Phone Numbers:	+234-803-783-5131
Date of Birth:	**9th May 1977**
Place of Birth:	**Onitsha,** Anambra
Nationality:	Nigerian
Marital Status:	Married
State of Origin:	Anambra State

Educational Background

Educational Institutions Attended with Dates and Qualification

(a) St. ThomasCollegeIbusa, DeltaState	1994	WASSCE
(b) School of Health Information Management (NAUTH)	1998-2002	HND
(c) Houdegbe North American University Benin Rep	2011-2014	BSc
(d) Lead City University, Ibadan	2020-2022	MSc

Work Experience with Dates

National Orthopaedic Hospital, Igbobi, Lagos	2008 to date
Anambra State Mnistry of Health	2006-2008
Nnamdi Azikiwe University Teaching Hospital Nnewi	2002

Professional Affiliations:

Health Records Officers Registration Board of Nigeria
Health Information Managers Association of Nigeria

Hobbies

Knowledge and Skill Acquisition

_____ _____

Signature **Date**

Referees

Dr. S.O Tunmibi
Department of Information Management
Lead City University,
Ibadan, Oyo State

Dr. A.E Anyabolu
Department of Respiratory Medicine
Nnamdi Azikiwe University Teaching
Hospital, Nnewi, Anambra State

Compliance Certification

This is to certify that this thesis was carried out by Obiorah Anthony EDOZIE (Matric No. **LCU/PG/002061**) of the Department of Information Management, Faculty of Communication and Information Sciences, Lead City University, Ibadan, Oyo State, Nigeria. in full compliance with the approved university format and style

---------- ----------

Signature Date