# FACTORS INFLUENCING ELECTRONIC HEALTH RECORDS ACCEPTANCE AMONG NURSES



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# FAKTOR-FAKTOR YANG MEMPENGARUHI PENERIMAAN REKOD KESIHATAN ELEKTRONIK DI KALANGAN JURURAWAT

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**DECLARATION**

It is my intention to declare that the work contained within this thesis is entirely my own, with the exception of any quotations or summaries that have been appropriately recognized.



15 February 2024

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## ABSTRAK

Rekod Kesihatan Elektronik (EHR) boleh meningkatkan kesedaran pesakit dan anggota kesihatan dalam meningkatkan kerjasama dan kualiti. Dengan menggunakan Unified Theory of Acceptance and Use of Technology Teori Penerimaan dan Penggunaan Teknologi Bersepadu (UTAUT), kajian ini bertujuan untuk menentukan unsur-unsur utama yang mempengaruhi penggunaan EHR di kalangan jururawat di Jordan. Kajian ini telah dijalankan secara tinjauan keratan rentas kepada 241 orang jururawat Hospital Universiti Raja Abdullah (KAUH) Jordan dan dianalisa menggunakan PATH. Hasil kajian mendapati bahawa, Jangka Prestasi (koefisyen 1.763, nilai P = 0.000), Jangka Usaha (koefisyen 0.045, nilai P = 0.043), Pengaruh Sosial (koefisyen 0.610, nilai P = 0.000) sangat mempengaruhi niat tingkah laku jururawat untuk menerima penggunaan EHR manakala Syarat Pemudahcara (koefisyen 0.021, nilai P = 0.000), mempunyai kesan positif yang lebih baik terhadap Niat Tingkah Laku berbanding beberapa faktor lain. Penemuan ini boleh digunakan oleh pembuat dasar bagi meningkatkan penggunaan EHR melalui peranan sosial agar jururawat dapat menggalakan sesama mereka untuk menggunakan teknologi ini serta digunakan untuk memastikan kecukupan dari segi teknolgi dan latihan. Pembuat dasar juga boleh mengenal pasti jururawat yang bersedia untuk mencuba teknologi maklumat yang baru. Cabaran seperti isu komputer, kelemahan infrastruktur dan kebolehgunaan EHR dapat dikurangkan supaya tidak merumitkan jururawat. Kajian ini juga telah mengenal pasti potensi bidang kajian yang membolehkan para penyelidik mengkaji dengan lebih mendalam penggunaan EHR di negara-negara membangun.

**ABSTRACT**

Electronic Health Records (EHR) can raise nurses' awareness to increase collaboration and quality. The study seeks to determine the key elements influencing Jordanian nurses' EHR acceptance. Jordan's King Abdullah University Hospital (KAUH) government hospital's 241 nurses completed a cross-sectional survey by using the Unified Theory of Acceptance and Use of Technology (UTAUT). The study analysed data using PATH analysis. The results of the study determined that, Performance Expectancy (coefficient of 1.763, P value = 0.000), Effort Expectancy (coefficient of 0.045, P value = 0.043) , Social Influence (coefficient of 0.610, P value =0.000) strongly effect the behavioural intentions of nurses to accept the EHRs and Facilitating Conditions (coefficient of 0.021, P value =0.000), have a positive impact on Behavioural Intention, although it's not as strong as some other factors. The findings imply that policy makers could enhance EHR acceptance by adopting social tactics to encourage nurses to urge one other to utilize them and assuring technological sufficiency and training. Policymakers could also identify nurses who are willing to try new information technology and minimize hurdles like computer crush, weak infrastructure and the EHRs usability to not be complex for other nurses. Additionally, highlight possible research areas that will enable academics to push the frontiers of both theory and empirical research and look deeper into the use of electronic health records in poor nations.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| EHRs | Electronic Health Records System |
| KAUH | King Abdullah University Hospital |
| TAM | Technology Acceptance Model |
| PU | Perceive Usefulness |
| PEOU | Perceive Ease of Use |
| UTAUT | Unified Theory of Acceptance and Use of Technology |
| PE | Performance Expectancy |
| EE | Effort Expectancy |
| SI | Social Influence |
| FC | Facilitating Conditions |
| ATUT | Attitude Toward the Use of Technology |
| BI | Behavioural Intension |
| UB | Use Behaviour. |
| UKM | Universiti Kebangsaan Malaysia |

# CHAPTER I

# RESEARCH OVERVIEW

## 1.1 INTRODUCTION

Electronic health records it's a collection of health information about a single person that is useful for figuring out their long-term health. Because it is necessary, the EHR would allow future health care to be given so that the patient has a better chance of getting better (Pavlovic et al. 2021). EHRs serve a central role for patient information, only accessible to the authorized healthcare provider and patient's, these digital records are created to manage patients' data and to be accessible electronically, by replacing the traditional paper-based medical records (Kanade & Kumar 2021).

Despite the growing the EHRs in healthcare settings, nurses and other healthcare professionals face certain challenges related to EHRs, such as system complexity, the usability of the EHRs , and challenges related to organization such as staff training and equipment shortage (Gyamfi et al. 2017), these factors can hinder the acceptance of the EHRs and that can impact the workflow and unintended consequences for the patient safety, due to system poor implementation, while some studies in the literature have explored EHR systems using the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) are two models that have been developed that discussed in chapter 2.

This research project seeks to identify the broader factors that contribute the effect of the workflow, ultimately providing valuable insights to enhance workflow efficiency and patient safety within the healthcare setting, the results for this study it is recommendations that can be use by healthcare organizations and policymakers to

enhance nurses' acceptance based on the most factor that can affect the acceptance of the EHRs from nurses' perspective.

## 1.2 RESEARCH BACKGROUND

### 1.2.1 Evolution of Health Records

Patients' health records have evolved significantly over the past years. Traditional paper-based records, while useful, were limited in accessibility, exposed to physical damage, and challenging to organize and search. With digital technology, the transition to EHRs began. EHRs not only contain comprehensive health information but also offer real-time updates, interoperability with other systems, and cloud storage capabilities.

### 1.2.2 Benefits of EHRs

EHRs have benefit to the healthcare in multiple ways such as: clinical documentation, tracking of ancillary testing, efficient insurance authorization, accurate billing, and improved patient experience, (Bobadilla et al. 2017). Additionally Improved patient safety and reduced medical errors, improved diagnostic accuracy and treatment, Increased efficiency, and reduced healthcare costs, Useful for decision-making (Abramson et al. 2018), improving coordination between hospitals and clinics and improve quality of health care. (Entzeridou et al. 2018)



### 1.2.3 Challenges in EHR Adoption

Despite the obvious advantages, challenges persist, especially for frontline workers like nurses. System complexity, usability issues, and the need for consistent training are primary concerns. Additionally, concern about privacy and security of patient information in the system it is a major issue that prevent organizations to adopt EHRs, (Keshta & Odeh 2021), impact of EHRs on clinical health provider in workflow and how the EHRs effect workflow in negative way (Upadhyay & Hu 2022)

### 1.2.4 Stakeholder Perspectives

While this research focuses on nurses, it's essential to acknowledge that EHRs impact a broad spectrum of stakeholders. Patients, for instance, from two of the four health regions in Norway were invited to participate benefit from EHRs can be used by the patient to get access to their information and that will enhance the knowledge and increase patient satisfaction for the patient. Some potential benefits include enhanced self-care practices for nurses and healthcare providers, increased sense of empowerment, and improved communication with healthcare professionals, (Zanaboni et al. 2020). EHRs contribute to enhanced communication, increased medication safety, and facilitated information sharing. The utilization of EHRs has become a commonplace practice among nurses in various healthcare institutions, integrated seamlessly into their daily routines.(Alhur 2023).

## 1.3 PROBLEM STATEMENT

The majority of the research that has been done on the subject of the acceptability and adoption of electronic health record (EHR) systems has concentrated on aspects such as demographic characteristics, computer usage, information, and communication technology (ICT) knowledge (Thit et al. 2020), and the viewpoints of physicians and other healthcare practitioners. However, there is a need for additional research that considers other determinants such as organizational factors, training opportunities, leadership support, and other perspectives of healthcare stakeholders such as nurses. Furthermore, the current literature has predominantly utilized theoretical frameworks. The studies that have been conducted on the Unified Theory of Acceptance and Use of Technology (UTAUT) have focused on particular variables within this model without considering other variables, in this study we are going to use UTAUT model to measure all the variables that influence the behavioral intension and the using for EHRs acceptance from nurse perspective.

## 1.4 RESEARCH OBJECTIVES

1. To identify the factors influencing nurses' acceptance and of electronic health record (EHR) systems in healthcare settings.

2. To investigate the connection between the acceptance of electronic health records (EHRs) by nurses and actual use of these systems.

## 1.5 RESEARCH QUESTIONS

1. What are the factors influencing nurses' acceptance and usage of electronic health record (EHR) systems.
2. What is the relationship between all the factors and nursing acceptance of the actual usage of the EHRs.

## 1.6 SCOPE OF THE STUDY

This research project follows the guiding principles for examining the acceptance of nursing who are using electronic health record in King Abdullah University Hospital (KAUH) in Jordan, the EHRs used in this hospital called iSOFT system, and UTAUT theory is an essential model for researching acceptance among nurses for this technology in the hospital. Also, to conduct a questionnaire survey, which there are a set of questions will be listed in the survey for better understanding of behavior, this empirically tests the study hypothesis by using a path modelling approach of partial least square (PLS), and for statistical analysis, which are the best modellings to analysis the data collected and to come out with the precise result. The research model as shown in the Figure 1.1 is the testing model for a quantitative research method.

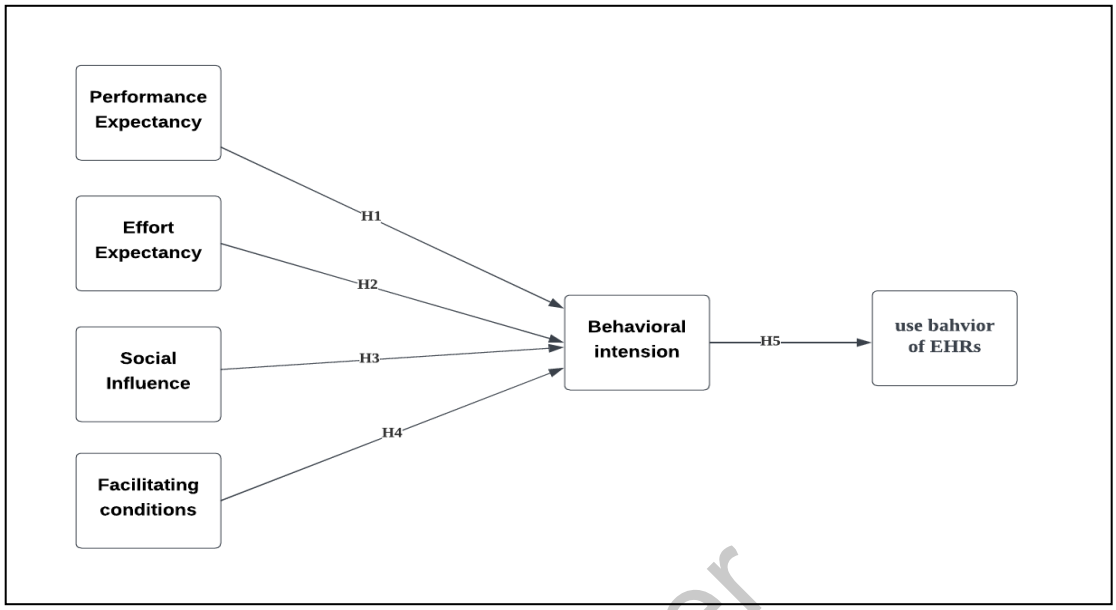


Figure 1.1 The proposed Model of UTAUT theory for this research

## 1.7 SIGNIFICANCE OF THE STUDY

For the purpose of optimizing electronic health record (EHR) systems, as well as improving patient care and operational efficiency in healthcare institutions, it is of the utmost importance to have a thorough understanding of the elements that influence nursing acceptance of EHRs. There are five important factors to consider:

1. Performance Expectancy: Reflecting the perceived benefits of EHRs.
2. Effort Expectancy: Highlighting the complexity and training required for EHRs.
3. Social Influence: Indicating the extent of organizational support for EHRs adoption.
4. Facilitating Conditions: Emphasizing the enabling environment, including organizational support, and training for EHRs.
5. Behavioral Intentions and use behavior: Representing nurses' acceptance of EHRs.

Policymakers, businesses, and analysts can leverage these insights to address overlooked areas in EHR implementation and adoption. Additionally, the findings can guide system improvements tailored to the unique challenges nurses face.

## 1.8 CONSTRUCT OF CHAPTERS

### 1.8.1 Chapter 1: Introduction

This chapter provides an insight into the factors affecting nurses' willingness to adopt Electronic Health Records (EHRs). initiate by delving into the theoretical backdrop and identifying the central research question. Following that, we'll detail the primary objectives of the study, along with the associated questions and hypotheses. The chapter concludes by highlighting the significance of this research and offers an overview of the subsequent chapters in this dissertation.

### 1.8.2 Chapter 2: Literature Review

This chapter examined literature and discussed all the relevant theoretical models. The suggested conceptual framework was defined to establish the framework of relationships and develop hypotheses. In addition, the relationships that existed between the independent variables and a dependent variable investigated in the project were discussed. Furthermore, along with supporting studies by other researchers, a thorough explanation of each variable was included.



### 1.8.3 Chapter 3: Methodology

The methods of study followed in the current investigation were outlined. This began with the description of the study concept and the data collection techniques employed. Additionally, the construction of the samples was assessed. Furthermore, the questionnaire was discussed in terms of the research instrument and construct measurement. The chapter also explained data analysis, validation, and reliability tools used to measure the model, along with the evaluation of the structural model.

### 1.8.4 Chapter 4: Data Analysis.

The review and analysis process were presented in this chapter, along with the interpretation of the findings. The procedures commenced with the assessment and analysis of the theoretical model, which was formulated based on the literature. The measurement model included considerations of data reliability, internal consistency,

convergent validity, and discriminant validity. Tests of hypotheses were conducted for the structural model.

### 1.8.5 Chapter 5: Discussion, Conclusion, and Implications

In this chapter, the statistical analysis, conclusions, and the hypothesis testing of the results from the previous chapters were explained. The chapter also delved into the description of the results and drawbacks of the analysis. Additionally, several recommendations for future studies were discussed.

## 1.9 CHAPTER SUMMARY

The requirements for the acceptability of electronic health records are briefly discussed in this chapter. Additionally, a number of study objectives and questions have been offered in this chapter in order to investigate the factors that influence the acceptance of electronic health records (EHRs) by nurses working in hospitals. The suggested theories have also been collected to conform to study concerns. Afterwards, the purpose of the chapter was discussed, and the layout of the chapter was presented.

# CHAPTER II

# LITERATURE REVIEW

## 2.1 INTRODUCTION

In this chapter, discussed and found what is electronic health record systems (EHRs) and their role in healthcare institutions and hospitals. At the first phase of the literature review, which was divided into six sections, there was a discussion of the definitions, functions, and stakeholders of electronic health records (EHRs) at hospitals. In the second section the focus was on the benefits of the EHRs and how it was useful in hospitals for the patients and for the end users, the third section is highlighting the challenges that can hinder the implementation of the EHRs and what can affect the acceptance of the end users, the fourth section was examine the barriers that can face the EHRs during the implementation phase , the fifth section explored the models and theories that can use to measure the stakeholder's acceptance of the EHRs. And finally, in the last section, provide an example of the EHRs users acceptance, discuss the theories used in their studies and find the gap to work on it.



## 2.2 EHR FUNCTION AND STAKEHOLDERS/ END-USERS WHO USE IT.

Electronic health records (EHRs) have become an important tool in modern healthcare, providing a digital record for patient data, accessible to healthcare providers and authorized users, with a focus on protection from cyberattacks. The purpose of EHRs is to reduce medical errors, enhance patient outcomes, and improve healthcare delivery by ensuring timely data entry at the point of care (Kanade et al., 2021).

According to Kanade et al. (2021), EHRs are defined as a support system integrated into healthcare efficiently, containing retrospective, concurrent, and prospective information. Mohamed et al. (2023) introduced the Health Information

System (HIS) as a specialized digital system managing clinical and administrative aspects in hospitals, emphasizing EHRs' role in enhancing safety, quality, and efficiency in medical care.

Many existing Electronic Health Record (EHR) systems come with integrated features, including Computerized Physician Order Entry (CPOE), enabling medical professionals to electronically input medication orders, and Clinical Decision Support (CDS), which aids in decision-making (Entzeridou et al.,2018)

In conclusion, stakeholders who are using EHRs include healthcare professionals, healthcare organizations, patients, government agencies, and software vendors. Healthcare providers and organizations utilize EHR systems to manage patient health data, enhancing the quality of care. Patients benefit from EHRs by securely storing and easily accessing their health data. Software vendors play a role in developing and marketing EHRs to healthcare providers, while government agencies provide guidelines and regulations to ensure proper use and security of EHRs.



## 2.3 EHRS AND BENEFITS

Electronic Health Records (EHRs) offer numerous benefits that significantly impact healthcare providers' workflow and enhance patient care efficiency. Some key advantages supported by relevant studies will go in details for each one.

According to Bobadilla et al. (2017), EHRs contribute to clinical documentation, enabling the tracking of patient testing, ensuring accurate billing, facilitating efficient insurance authorization, and ultimately improving the overall patient experience.

Abramson et al. (2018.) highlight the capability of EHRs to reduce medical errors, enhance patient safety, improve accuracy in patient diagnosis and treatment, and decrease the overall cost of patient care. EHRs also prove valuable in decision-making processes to reduce diagnostic errors.

Entzeridou et al. (2018) discuss how EHRs can enhance coordination between hospitals and clinics connected within the same system, fostering seamless communication and collaboration.

Enhanced proactive patient care was observed, exemplified by the implementation of reminders for immunizations and examinations. Certain teams utilized EHR tools to monitor shifts in particular assessment scores over time, facilitating the identification of patients in need of specific services (Kosteniuk et al. 2023).

And finally, Zanaboni et al. (2020) emphasize, empowerment, and communication with healthcare professionals in the hospital by using the EHRs.

### 2.3.1 Streamline testing, insurance, billing.

Bobadilla et al. (2017) delve into the complexities involved in implementing EHRs, highlighting the need for significant resources for successful implementation. The article presents the outcomes of a 3-year improvement project in a high-volume surgical clinic conducted during fiscal years 2014-2016. The authors spotlight the challenges faced during the EHR implementation process, particularly in a fast-paced clinical environment dealing with a variety of patients with performing same-day minor surgical and dermatologic procedures. Overall, the study emphasizes the importance of a structured approach to EHR implementation and the potential for significant clinical and operational improvements during the transition.

The implementation of the EHRs, as reported by Bobadilla et al. (2017), has yielded substantial benefits in clinical, operational, and financial downstream processes. These benefits encompass improved clinical documentation, tracking of ancillary testing, efficient insurance authorization, accurate billing, and enhanced in general patient experience. As a result of the implementation, end-users have been able to work at the highest levels of their licenses, improving throughput and evenly distributing work efforts. While standardization was encouraged where possible, customization was also allowed for specialized work. The active engagement of clinic leadership proved critical for the successful adoption of EHRs by clinic staff.

### 2.3.2 Eenhance safety, reduce errors, improve diagnostics, and boost efficiency and decision-making.

According to Abramson et al. (2018) in order to improve the quality of treatment provided to patients, the healthcare industry is progressively implementing information and communication technology (ICT), which includes electronic health records (EHRs), computerized physician order entry (CPOE), and laboratory information systems (LIS). The data generated by the healthcare system is seen as a valuable resource that can improve patient safety, reduce medical errors, enhance diagnostic accuracy and treatment, increase efficiency, and lower healthcare costs. The authors particularly emphasize the role of EHRs in providing evidence for informed decision-making and implementing the practice-based evidence approach.

For their study the survey included 30 participants selected from public hospitals and clinics in Singapore, representing various medical specialties, with ages ranging from 36 to 45. The primary objective was to understand how doctors perceive the benefits of EHRs and how the data from EHRs can aid decision-making, especially in implementing the practice-based evidence approach.



The survey results indicated a high percentage of doctors believing that EHRs improve access to patient health data, reduce potential medical errors, identify patients needing laboratory or radiology tests, and decrease redundant testing and drug ordering. However, fewer strongly agreed that EHRs support treatment planning or diagnosis, and some expressed uncertainty about the capabilities of EHRs in patient diagnosis. Nevertheless, the majority agreed that the use of EHRs leads to more informed decision-making and safe care management.

Furthermore, the survey revealed that EHR data was considered useful for decision-making by all doctors, with minimal disagreement. Doctors unanimously agreed that EHR data guided alerts for critical laboratory results and appropriate medications. Over 90% recognized its potential for improving decision-making in patient diagnosis and ordering appropriate tests. Almost 90% also acknowledged that EHR data can provide treatment plans. While more than 70% agreed that EHR data could help in preventive patient care and using clinical guidelines to enhance decision-

making, a significant proportion remained neutral, suggesting that EHR systems may not have captured this information or had limited impact on decision-making improvement.

In conclusion, the doctors in Singapore, in general, hold a positive perception of the benefits of EHRs, believing that EHR data can significantly contribute to effective patient care management and delivery. This aligns with the adoption of the practice-based evidence approach alongside evidence-based practice. The identified benefits include improved patient safety, reduced medical errors, enhanced diagnostic accuracy and treatment, increased efficiency, and lower healthcare costs, emphasizing the value of EHRs for decision-making in healthcare (Abramson et al. 2018).

### 2.3.3 Improving coordination between hospitals and clinics and improve quality of health care.

In their study, Entzeridou et al. (2018) examine the various advantages associated with Electronic Health Records (EHRs), with a particular focus on their ability to improve the accessibility of health data, mitigate the occurrence of allergic responses, and facilitate effective communication among healthcare professionals. The European Union has built the necessary foundation for the introduction of EHR, while Greece has enacted a legislative framework to facilitate its adoption. Nevertheless, the adoption of EHRs in Greece has been characterized by a fragmented approach, accompanied by a lack of comprehensive comprehension regarding the attitudes and perspectives of physicians towards these systems. For the purpose of addressing the existing disparity, the major objective of the study is to investigate the prevalent viewpoints regarding electronic health records (EHRs) within the setting of Greece. The study employed two distinct questionnaires, one designed for the general public and another tailored specifically for physicians, in order to examine their attitudes and perceptions pertaining. The results suggest that a significant proportion of both the general population and medical professionals hold the belief that EHRs have a beneficial effect on patients through facilitating expedited, enhanced, and more efficient decision-making processes. Additionally, it was communicated by the participants that electronic health records (EHRs) play a vital role in enhancing the cooperation between clinics

and hospitals. improving the quality of healthcare, and mitigating the financial burden associated with healthcare expenses.

Significant importance of EHRs inside healthcare systems, as they enable enhanced healthcare administration and improved quality of care. The benefits of EHRs are acknowledged by both the general public and medical professionals, provided that privacy and security issues are adequately addressed (Entzeridou et al., 2018).

This section highlights the advantages and benefits associated with EHRs from both patients and healthcare providers perspectives, which the EHRs have become essential tools in modern healthcare. EHRs play a crucial role in improving patient care and streamlining healthcare provider communications. However, it's important to acknowledge that the adoption of EHRs is not without challenges that we will discuss in the next section such as, ensuring data security and privacy, along with adequately training healthcare staff to use these systems effectively, are critical considerations in their successful implementation. Nevertheless, the benefits of EHRs, including the prevention of patient harm, enhancing communication among healthcare providers, and reducing treatment costs as we discussed before.



## 2.4 EHRS AND DRAWBACKS OF IMPLEMENTATION

Despite the benefits and advantages that discussed in the previous section the major studies focused on patient outcome and didn’t gave the importance of healthcare provider outcome, there were few studies talked about this, studies that showed disadvantages for EHRs that discussed. In this section like Keshta & Odeh (2021) discuss a concern about privacy and security of patient information in the system it is a major issue that prevent organizations to adopt EHRs, the second concern with EHRs is emphasized by Upadhyay & Hu (2022), who examine the impact of EHRs on clinical health provider workflow. Their research provides evidence-based studies that demonstrate the detrimental effects of EHRs on workflow.

### 2.4.1 Privacy and Security of patients in EHRs.

A study done by Keshta & Odeh (2021) discusses the challenges associated with implementing EHRs, particularly concerns related to privacy and security. The use of EHRs has numerous benefits, but the transition from paper-based records to EHRs has been challenged by funding, technology, organizational structure, and attitudes. There are many Concerns about privacy and security of sensitive patient data have emerged as a significant barrier to the widespread adoption of EHRs. three main properties of information security, namely confidentiality, integrity, and availability, and how they are mutually exclusive. There have been a number of studies that have investigated the influence that individuals' worries about privacy have on their willingness to share their health information online. Also discusses the security and privacy features of current EHRs and how they are categorized into physical, technical, and administrative safeguards.

The main issues regarding electronic health records (EHRs) implementation can be categorized as follows:



**i. Privacy and Security Concerns**

It's one of biggest concerns regarding the implementation of EHRs and should take into count, patient's data is sensitive and needs to be protected from unauthorized access and cyber-attacks. There are different security requirements for IoT systems, including identity management, network security, trust, resilience, and privacy have been proposed to address these concerns. The standard model for information technology security, based on integrity, confidentiality, and availability, should provide a framework to address these concerns and issues (Keshta & Odeh 2021)

**ii. Challenges in Implementation**

There are many challenges that can hinder the adoption of EHRs, such as funding, technology, organizational structure and support, and end users' attitudes. Transitioning from paper-based records to EHRs requires an investment of money, time, and

resources. And Health organizations need to overcome these challenges to implement EHRs successfully (Keshta & Odeh 2021).

**iii. Impact of Privacy Concerns on Acceptance**

Individuals' preferences regarding sharing electronic health information vary depending on the type of information subject to sharing. Privacy concerns affect the acceptance of electronic health records differently (Keshta & Odeh 2021).

### 2.4.2 Increase workload on users.

In this study Upadhyay & Hu (2022) the benefits and disadvantages of EHRs on clinical health providers, the study here talked about EHRs staff training: some of the staff said they didn't get the proper training before working on the EHRs. Based on the findings of prior research, it has been shown that giving user training can be an effective method for enhancing the acceptability of electronic health records (EHRs), enhancing the utilization of EHRs, and boosting satisfaction with EHRs, either directly or indirectly. EHRs interference: clinician said that EHR is time consuming while doing documentations and takes the attention from their patients the solution for this problem is to put computers in the patient's room so that patients can have the proper attention from their provider and because of documentations some provider said that it slow down the workflow especially for senior physicians because they have more tasks on EHRs than the junior physicians and because the EHRs has many tasks some physicians says that they got exhausted from EHRs tasks



Also, some nurses said that in documentation they copy and paste from the previous documentations to get some extra time, and this can lead to misunderstanding to patient's condition, and they can't deal with it in the proper way especially if they copy and paste something wrong (Upadhyay & Hu 2022).These are major disadvantages of EHRs from clinicians' perspective and other health care provider. But despite these disadvantages we cannot deny the benefits for EHRs because they can find solutions for it. The results were that there are several suggestions how to enhance EHRs implementation and redesigning like: design EHRs can enhance the training quality and put conditions in learning to achieve the goal from training, enhance documentation

function in data entry to detect the error and prevent it, explore the impact of EHRs adoption and software design.

The end users should help in building and update EHRs before implementation that will help to address the weak points of the system and avoid it, that will enhance the user acceptance of the EHRs and will help them to improve the EHRs quality in many perspectives not only in clinicians' perspective, also the concerns about security and privacy should take seriously and work on it that will enhance the patient's trust and satisfaction about their data will not be leak specially the psychiatric patients. These issues effect acceptance of the EHRs and should be considered.

## 2.5 EHRS AND BARRIERS

The implementation of electronic health record systems, also known as EHRs, has resulted in a revolutionary change within the healthcare industry, offering the potential to enhance patient care, optimize operational effectiveness, and mitigate financial burdens. Nevertheless, the adoption and integration of EHRs has encountered many obstacles. Various obstacles and limitations have been discussed in literature. For example, financing limitations, technical constraints, inadequate availability of full-time IT knowledge, standardization problems, and the absence of automatic data and power backups have been identified as significant barriers (Gyamfi et al. 2017). Additionally, communication failures related to the use of electronic health records have been highlighted by Onur Asan et al. (2018). Inadequate integration of workflows among diverse healthcare professionals and insufficient connectivity with other healthcare organizations within EHRs may lead to an elevated burden on providers such as nurses (Tsai et al. 2020). Lastly, Vehko et al. (2019) in this part have emphasized the issues of low dependability and user-friendliness of EHRs, which can potentially impede the successful adoption of EHRs.

### 2.5.1 Funding, Technical Constraints, Limited IT Expertise, Standardization, and Backup Constraints.

According to Gyamfi et al. (2017) The EHRs have many advantages but that seen in high income countries not in low- and middle-income countries. this study conducted

in Ghana to make health policies better. It is a cross-sectional study using a semi-structured interview guide. The study population are implementers and end-users of the EHRs, describes the perceived facilitators, and barriers to EHR use, also suggestions to find a solution for these barriers for successful implementation of EHRs. The results for their study are discussed under the headings below: The results are discussed under the headings below:

**i. Existing Facilitators**

available tools and devices such as scanners, servers, printers, computers. also training on the EHRs provided to all end-users. some of the end-users had a technological background which these factors enhance the ease of use of the EHRs (Gyamfi et al. 2017).

**ii. Existing Barriers**

one of the primary barriers was financial and human resources such as lack of funding to hire IT technicians and buy proper equipment for the implementation and after implementation phase. also data entry error such as incorrect birth date entry and data duplication. absence of backups which can result in data loss and that is more cost for the hospital or the organization. and finally increase the workload to the end users because of the complexity of the system and slow responses during the process (Gyamfi et al. 2017).

**iii. Suggestions to implement facilitators.**

The most important facilitator for EHRs implementations is human and financial resources such as hire IT technicians with health background to manages EHRs and control data entry to prevent any error and to make sure of the successful implementation, also to encourage the end users to maintain the user's acceptance toward the EHRs usage. (Gyamfi et al. 2017).

**iv. Suggestions and solutions for EHRs implementations barriers.**

The successful implementation of the EHRs project is computers, internet, and backup systems for data and power. The need for alternatives to address the issue of multiple registrations was also highlighted. Finally, a reward system for staff and regular EHR training programs should be considered (Gyamfi et al. 2017).

### 2.5.2 Communication between health care providers failures.

Electronic health record systems (EHRs) are increasingly important in healthcare procedures, notably in information transfer and care coordination across providers, according to Onur Asan et al. (2018). EHRs may put patients at danger, even while they improve communication. Despite EHRs' purported benefits in increasing healthcare professional communication and care coordination, communication breakdowns owing to poor information transfer might damage patients. The study recommended rethinking or enhancing EHRs to improve patient-provider communication during patient visits.

Oncologists could quickly access records and share information using EHRs, however charting time, data from other physicians, and unnecessary data transmission were issues. The study stressed the relevance of real-time multidisciplinary cooperation in cancer treatment decisions and EHRs in capturing tumour board consensus recommendations.

EHR utilization during patient visits was also examined. Doctors understood how computers affect patient communication during clinic appointments. The study found that the emotional state of patients, their desire to see the findings, their level of knowledge, the familiarity of providers with the content, the workload of the clinic, the amount of time that was allotted for each visit, and the architecture of the examination room all had an impact on the screen-sharing behaviours of doctors.

In summary, the research conducted by Onur Asan et al. (2018) highlighted the deficiencies of current EHRs in promoting efficient cooperation among oncology practitioners, which may lead to significant safety hazards in the field of cancer treatment. The results underscored the necessity of reconfiguring EHRs functionalities

specifically designed for the distinct demands of oncology treatment to minimize safety hazards, tackle worries regarding excessive data, improve the organization of results, and lessen the burden of paperwork. When it comes to oncology care, the adoption of individualized electronic health record features is an essential component in ensuring the preservation of patient safety.

### 2.5.3 Low EHRs reliability and low user-friendliness.

In the recent few years, the healthcare organizations and hospitals environment changed due to increasing in the (ICT) information communication technology, and that changing is making more pressure on the staff because they need to adapt skills related to technology. According to (Vehko et al. (2019) the new technology doesn't solve job related problems unless the implementation of the technology is well implemented, the study is focusing on the healthcare provider the registered nurses and physicians who are using the EHRs and take their feedback how effect the work-related stress and time pressure constraints among them.

Low electronic health record (EHR) reliability and low user-friendliness were shown to be linked with high time pressure, while low EHR reliability, low support for cooperation, and low e-care competence were found to be associated with high psychological distress. These findings were derived from observations made by covariance analyses. Those who worked in primary healthcare were also subject to a significant amount of time pressure constraints. A significant level of emotional anguish was also connected with advancing age. The inability of electronic health records (EHRs) to be user-friendly and their lack of dependability are the leading causes of time constraints, pressure, and emotional anguish for registered nurses.. The findings suggest that hospitals and health institutions should consider the experiences of RNs with EHRs and take actions to strengthen their eHealth competence. It is recommended that RNs' who were working using the EHRs and digital tools should consider when implementing EHRs (Vehko et al. 2019).

The studies here highlights the EHRs implementation barriers in low-income countries and focus on what will they face before and after the implementation, also

highlight that the communication between providers and patient very important and can affect the patient psychology especially in cancer patient because they need emotional support, and finally they highlight that the system should be reliable and user friendly for healthcare providers In light of the fact that these variables are the principal causes of time constraints, pressure, and emotional discomfort for registered nurses, the organization must to take into consideration these factors prior to the adoption and take measures to strengthen their EHRs.

## 2.6 THEORETICAL FRAMEWORKS USED IN EHR ACCEPTANCE.

EHRs are becoming increasingly prevalent in healthcare organizations worldwide, and their adoption and use have been shown to have significant impacts on healthcare quality and efficiency. However, the successful adoption and use of EHRs by healthcare providers depends on many factors, including user acceptance and satisfaction.

The acceptance of EHRs by users has been evaluated using a number of different theories and models. such (TAM) and the (UTAUT) are two theories that are frequently utilized in the field of learning about user acceptance and satisfaction with electronic health records (EHRs). In this section, covered both of these theories that were used in the EHRs acceptance. In addition to providing a framework for understanding that can lead to improved user acceptance and utilization among healthcare providers, UTAUT theory can also guide in the process of designing and implementing electronic health records (EHRs) that can be able to better satisfy the requirements of nurses.



### 2.6.1 Technology Acceptance Model (TAM)

(TAM) is a theoretical framework that is frequently used to analyze how users embrace and use technology. It was initially developed by Davis (1989), and since then, it has been worked upon and improved upon by a number of other scholars.

The TAM proposes that two primary factors influence users' intention to use a particular technology: perceived usefulness and perceived ease of use as shown in Figure 2.1.

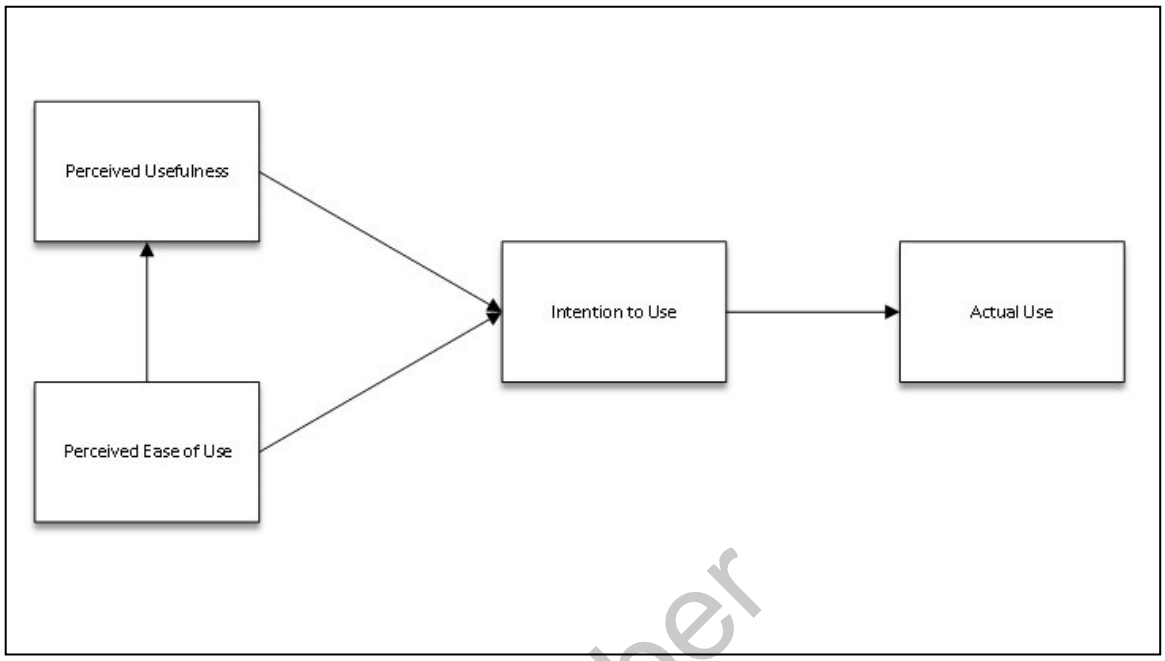


Figure 2.1 TAM Model by Davis (1989)



The two primary factors are:

**i. Perceived Usefulness**

The amount to which a user believes that a specific technology will increase their performance or productivity is the aspect that is being referred to here. The impact that technology is believed to have on job performance is one of the aspects that can have an effect on how valuable something is thought to be.

**ii. Perceived Ease of Use**

The extent to which a user believes that a technology is simple to operate is the consideration that is referred to by this element. Factors such as the user's prior familiarity with technology, the complexity of the technology, and the availability of training and assistance all play a role in determining how easy it is perceived to use. An effective framework for understanding the elements that influence users' acceptance and adoption of technology is provided by the Technology Acceptance Model. This model can also be used to guide the design and execution of technological interventions that are more likely to be successful.

To summarize, TAM offers a complete framework for getting a better understanding of the elements that influence the acceptance and adoption of technology by users. It is possible for those who design and implement technical interventions to boost the possibility of successful acceptance and utilization of new technologies by taking into consideration the number of different elements listed above.

### 2.6.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT model was developed. As shown Figure 2.2., it was established by Venkatesh et al. (2003) based on four earlier models of technology adoption. These models were the Theory of Reasoned Action, the Technology Acceptance Model, the Motivational Model, and the model of PC utilization.

The UTAUT model proposes that four factors influence people's adoption and use of technology:

**i. Performance Expectancy:**

this refers to the extent to which an individual believes that the utilization of a specific technology will assist them in carrying out their responsibilities in a more efficient manner.

**ii. Effort Expectancy:**

The degree to which an individual believes that utilizing a specific technology would be simple and require little effort is referred to as the degree of confidence in the technology.

**iii. Social Influence**

The degree to which an individual believes that significant others, such as friends, family, or coworkers, believe that they want to make use of the technology is referred to as the degree of that perception.

**iv. Facilitating Conditions**

refers to the extent to which an individual feels that the resources and support required to make use of the technology are readily available.

Additionally, the UTAUT model also includes four moderators that can influence the relationship between these factors and technology adoption:

**v. Gender**

This refers to the difference in technology adoption and use between males and females.

**vi. Age**

This refers to the difference in technology adoption and use across different age groups.

**vii. Experience**

This refers to the degree to which an individual has prior experience using similar technologies.

**viii. Voluntariness of use**

This refers to the degree to which an individual has a choice in deciding whether to use the technology or not.

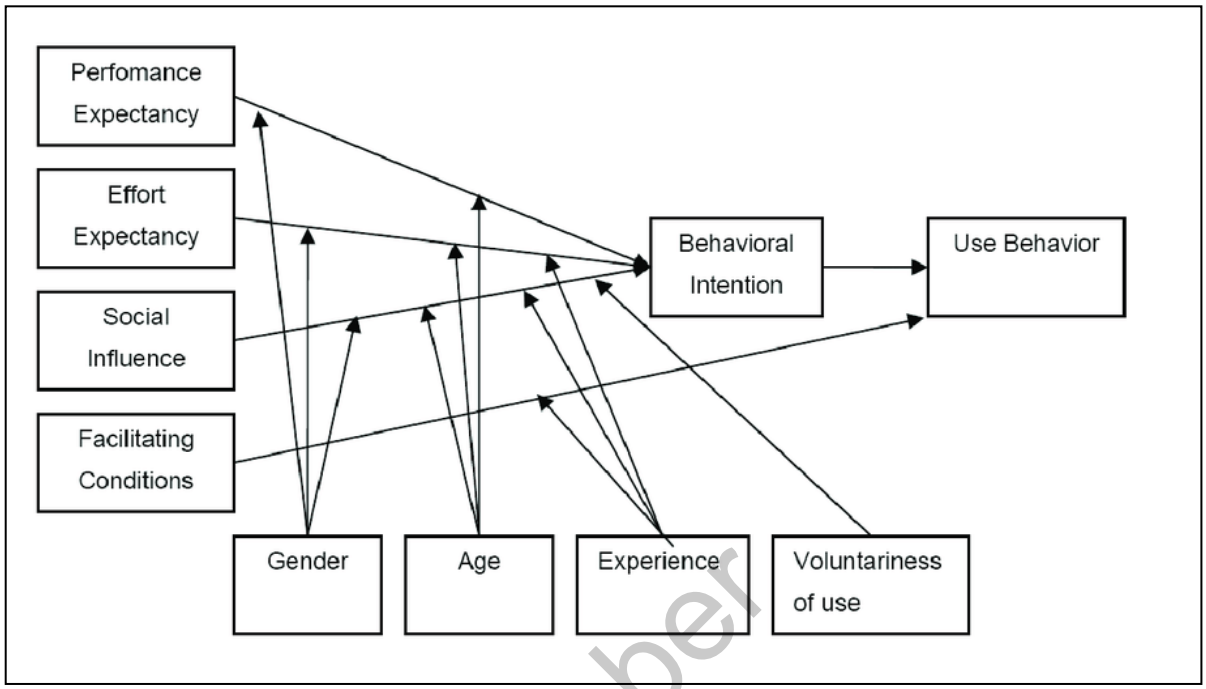


Figure 2.2 UTAUT Model by Venkatesh et al. (2003)



Numerous studies have been conducted using the UTAUT model to investigate the acceptance and utilization of a wide range of technologies in a variety of settings., including e-government, e-commerce, and healthcare. The fact that it offers a complete framework that considers a variety of elements that influence the adoption and utilization of technology is what makes it worthwhile., as well as their interrelationships. By understanding these factors, organizations can design and implement technology in a way that maximizes user acceptance and use.

## 2.7 END USERS' ACCEPTANCE

The term "acceptance" of electronic health record systems refers to the willingness of healthcare practitioners to use and use electronic health records (EHRs) as a component of their clinical workflow. (Pavlovic et al. 2021). Numerous elements, such as socio-demographic characteristics, age, duration of employment, and other aspects, all play a role in acceptance. Here discussed some article that measures EHRs acceptance using TAM by Davis (1989) and UTAUT by Venkatesh et al. (2003).

### 2.7.1 Literature EHRs acceptance used by TAM theory.

The use of EHRs that can improve healthcare delivery and patient safety, but their adoption is met with resistance from medical staff, particularly nurses, who are concerned about changes to their daily work routines. Recent studies show that attitudes towards EHR usage have become more positive among nursing staff, with factors such as education, computer knowledge, and job position affecting these views. In Saudi Arabia, a study utilizing the Technology Acceptance Model (TAM) is being conducted to evaluate by Aldosari et al. (2018) and study the factors influencing nursing staff's adoption of EHR systems and encourage integrated implementation in other hospitals in the country. EHR acceptability by nurses depends on user-friendly technologies and training. The study was conducted in the recognized Imam Abdulrahman Al Faisal National Guard Hospital in Dammam, Saudi Arabia, which has 112 inpatient beds and 7000 outpatients every month. The study targeted all hospital nurses utilizing the EHR clinically.

Additionally, to Aldosari et al. (2018) the perceived ease of use component of EHRs acceptance, the majority of nurses felt that it is simple to learn how to use EHRs, and that it is simple to use. In addition, the most of nurses concurred that it is simple to understand how to perform the duty that they are supposed to be doing using electronic health records. There must be support from upper management to implement EHR. In addition, 65.9% of nurses agreed that it is essential to have help from associated departments to embrace electronic health records (EHRs), and 53.0% of nurses confessed that they had sufficient formal training to utilize EHR. Furthermore, 58.9% of respondents agreed that the IT personnel offered sufficient support to electronic health records (EHRs).

In conclusion nurses had a favourable outlook on the convenience and practicality of electronic health records (EHRs) compared to paper-based records because EHRs offer improved accuracy, data accessibility, and patient safety. Factors such as demographics, IT support, management support, and system quality predicted nurses' acceptance of EHRs. The study suggested that providing training to nurses who

have not undergone formal system training could increase acceptance (Aldosari et al. 2018).

Also Thit et al. (2020) discusses the importance of EHRs in improving the quality and efficiency of healthcare services. EHRs have been rapidly introduced in high-income nations, whereas Myanmar still uses paper medical records. According to the technology acceptance model (TAM), demographic factors like age, education, position, computer usage, and ICT skills may affect EHR use. The knowledge acquired from this investigation can help make strategic decisions regarding the initial implementation of an EHR system in their clinics.

Regarding to Thit et al. (2020) conduct their study at Marie Stopes International Myanmar (MSI-M) head office and 13 clinics across regions. Doctors, nurses, midwives, lab technicians, cashiers, sexual and reproductive health promoters, and program staff were surveyed. The study examined MSI-M clinic EHR system technical viability and user acceptance. A questionnaire on staff computer usage, technology, and network availability analysed technical feasibility. EHRs user adoption was studied using the Technology acceptance Model. The study methodology aimed to determine the readiness of MSI-M clinics for EHRs implementation. The questionnaire used in the study was divided into four sections: demographic information, user acceptance, information, and communications technology (ICT) knowledge, and computer usage.



for user acceptance measures, compared to other regions or states, Yangon, Mandalay, and Ayeyarwady staff had higher perceived usefulness (PU) and intention to use (IU) scores. However, head office and management administration professionals were less willing to use the proposed system than other areas and job categories. The final model indicated that PU and head office staff membership affected the proposed system's IU (Thit et al. 2020).

And finally, Alhur (2023) focuses on the perceptions of electronic health records (EHRs) held by nurses working in four hospitals located in Saudi Arabia and seeks to provide recommendations for enhancing the utilization of EHRs in practice by employing (TAM). The most important topics that will be investigated are how nurses

feel about the utility of electronic health records (EHRs) and how they feel about how easy it is to utilize EHRs. In 2022, it was carried out in four hospitals in Saudi Arabia with the purpose of investigating the factors that influence the acceptability of electronic health records (EHRs) by nurses. All of the nurses working at the four hospitals that make use of the Healthcare Information System (HIS) were the intended recipients of the message. Using a straightforward random sampling approach, a sample size of three hundred and fifty was set. Through the use of a questionnaire that was constructed based on two factors, namely perceived ease of use (PEOU) and perceived usefulness (PU) of the electronic health records (EHRs), data was collected. For recording responses to the assertions, a Likert scale with five points was utilized, and it was discovered that the PU and PEOU subscales maintained a high level of dependability. The data were analysed with SPSS version 17, and Pearson's correlation coefficient was utilized in order to investigate the connection between the efficacy of the EHR system and its ease of use.



According to the findings, the perceived usefulness of electronic health records (EHRs) and the ease of use are significant factors that influence nurses' acceptance of EHRs. Rather than the efficacy of the technology itself, it was determined that changes in nursing workflows and processes were the challenges that were encountered during the process of implementing technology. To provide the highest possible level of care to patients, the study highlights the significance of evaluating the attitudes that nurses have toward technology, as well as the requirement for proper training and self-assurance in computer skills. (Alhur 2023).

TAM theory by Davis (1989) measures the acceptance based on two factors Perceive ease of use (PEOU) and Perceive usefulness (PU) but these two factors reflect the complexity of the system and user friendly but these are not enough to take the good implication of the acceptance about the EHRs there should be more addition to these two factors such as organizational support and training also the social influence that can affect the use and acceptance of EHRs in the hospital. In the next section we are going to cover the UTAUT model that has these additional factors.

### 2.7.2 Literature EHRs acceptance used by UTAUT theory.

According to study done by Hossain, Quaresma & Rahman (2019) the low adoption rate of the electronic health record (EHR) system at healthcare facilities, the adoption of the EHR system is a difficulty due to the adverse views of physicians towards it, such as concern about technology and ineffective communication between doctors and patients. In addition, physicians are concerned that the electronic health record system may alter the established procedures for work and disrupt the flow of work. The study underlines that physicians' negative opinions toward the EHR system are disturbing and can hinder adoption. The UTAUT model was utilized by the author in order to explore the factors that influence the adoption of electronic health records (EHRs) by physicians in Bangladesh's healthcare system. In addition, they found a strong correlation between physicians' intention and actual EHR use, suggesting that physicians' acceptance and use of EHRs depend on their intentions. A questionnaire developed to collect data on the usage of IT in healthcare by physicians in Dhaka, Bangladesh. Based on earlier studies, 300 samples were chosen for structural equation modelling data analysis. The researchers personally handed questionnaires to Dhaka's private and public hospital physicians with varied specialties.



They analysed factors that influence physicians' behavioural intention (BI) to use EHRs in Bangladesh. According to the findings of the study, the BI to use electronic health records (EHR) of physicians was significantly influenced by factors such as gender, age, medical specialization, medical knowledge, and use of information technology regarding healthcare. Significant relationships between (SI), (FC), (EE), (PE), and BI. However, the relationships between personal innovativeness, perceived ease of use, and resistance to change with BI were not significant. (Hossain, Quaresma & Rahman 2019)

In conclusion the study aimed to investigate the factors that influence physicians' adoption and use of EHRs in Bangladesh based on (UTAUT) model. The study found that (SI), (FC), and (PE) significantly influence physicians' (BI) to use the EHR system, while (EE), (PE), and resistance to change (RC) do not have a significant influence on. For the purpose of developing strategies and policies for the successful

implementation and acceleration of electronic health record adoption by physicians in Bangladesh, the findings of the study can provide significant information that can be utilized by planners, policymakers, and subsequently by clinicians (Hossain, Quaresma & Rahman 2019).

and Lulin et al. (2020) Used in their study the Unified Theory of Acceptance and Use of Technology (UTAUT) model to examine how performance expectancy (PE) and effort expectancy (EE) predict nurses' readiness to adopt and use hospital electronic information management systems (HEIMS) in Ghana. EHRs and hospital IT adoption effectiveness depends on nurses' motivation and readiness to use HEIMS in Ghana. This study involved 660 respondents who answered a questionnaire that comprised nine observed variables with 34 items in total.

PE, EE, and BI were examined for their impact on HEIMS use. PE and EE reported 37.2% explained variance of BI to employ HEIMS. The nurses' intents (BI) explained 39.7% of HEIMS' UB variation, and the three independent variables (PE, EE, and BI) explained 46%. Smart mobile devices were used to get a high response rate, and majority of the respondents were female nurses, staff nurses, and 20–30 years old (Lulin et al. 2020).



According to the results, Lulin et al. (2020) conclude that nurses' intentions to use a healthcare information system (HEIMS) were influenced by their perceived ease of use. However, the strongest predictors of their actual use of HEIMS were performance expectancy and effort expectancy. Therefore, health facility managers should focus on increasing nurses' confidence in using HEIMS and implementing a user-friendly system. The study contributes to understanding the behavioural issues of health professionals that resist using new technologies.

Also, another study used UTAUT model done by Yousef et al. (2021) they focused on personal health records (PHRs) acceptance using UTAUT model. The purpose of personal health records (PHRs) is to facilitate patient involvement, patient empowerment, and care that is patient- and person-cantered. They used behavioural intention to recommend as a proxy for adoption from patients based on the acceptance

of personal health records (PHRs) by healthcare professionals in order to discover predictors of PHR acceptance by healthcare providers. The healthcare provider who was involved in this study were physicians, nurses, pharmacists, technicians, and other health care providers. and 291 participants were involved in this study.

the health care providers here are not the primary users who are using the PHRs, but they can encourage the patients to involve in this technology and their acceptance can encourage and enhance the patients to use this technology.

the results of Yousef et al. (2021) study was (PE) and attitude were significantly associated with (BI) to recommend the PHR. Also, this hypothesis, which states that years of experience, age, and professional function all moderate behavioural intentions, was not supported by the findings of the study. It was found that the hypothesis that age, years of experience, and professional function all moderate behavioural intention was not supported by the findings of the study.



The purpose of this study was to investigate the factors that can influence the (BI) of health care providers in the kingdom of Saudi Arabia to suggest the patients' health record system to patients. Significant predictive ability was demonstrated by the fact that the proposed model was able to account for seventy percent of the variance in (BI). Predictions of health care professionals' (BI) to support the adoption of personal health records were significantly influenced by both their performance expectations and their attitudes.

In conclusion of Yousef et al. (2021) study here they were focusing on personal health record system from the health care providers perspective and how can they encourage the patient to use the personal health record system, but it was weak because the acceptance of the patients is more important than the acceptance of the health care providers.

In addition to measuring EHRs acceptance from another perspective Alsahafi, Gay & Khwaji (2020) talked here about the factors that can impact the acceptance of the EHRs from health consumers perspective in Saudi Arabia the study added the trust

and perceived security concerns factors into the Unified Theory of Acceptance and Use of Technology model. The questionnaire was sent to Saudi citizens to take their responses and they took 794 valid responses to analyse this study focus on PE, EE, SI, Perceived security concern and Trust variables. The population that was intended to be targeted in this was Saudi citizens who were at least 18 years old. The method used here is across sectional survey sent to Saudi citizens using a paper based and web-based survey.

The purpose of the perceived security concerns is to determine the extent to which the health care consumer believes that the utilization of a certain technology is secure in order to safeguard the consumer's privacy and confidentiality through the utilization of electronic health records (EHRs). And Trust it's the degree which the healthcare consumers are believing in the EHRs and if its reliable or not to all parties who are authorized to access the EHRs and its data.



The results related to Alsahafi, Gay & Khwaji (2020) in the model that was proposed, the role that (PE) played in the intentions of healthcare consumers was supported. Additionally, (EE) was found to be a significant predictor of (BI) to utilize electronic health records (EHRs). Despite the fact that it was hypothesized that (SI) would be a major predictor of (BI), the participants' felt security concern had a significant negative impact on (BI) to use the EHRs, as well as trust has a significant and beneficial impact on (BI) of Saudi healthcare customers to use electronic health records (EHRs).

In conclusion the study measuring the EHRs acceptance from the health care consumers perspective in Saudi Arabia by adding another variable to the UTAUT model and focuses on EE, PE, SI, perceived security and Trust, without mentioning the facilitating condition, this variable it's important to keep in the model because its reflect and measure if the organization who offers the EHRs giving them the appropriate technical and infrastructure support to use the system (Alsahafi, Gay & Khwaji 2020).

There are minimum studies done in healthcare using UTAUT model, also they didn't consider the nursing perspective only based on the literature. The nursing

perspective is very important to consider because they are the primary health care providers, and they represent a large group in the hospitals and health care organizations. and their acceptance can reflect the proper implementation of EHRs that can enhance the patient's quality of care. And UTAUT model has proper variables that can reflect a good impression of EHRs using.

## 2.8 TAM AND UTAUT SUMMARIZATION

Table 2.1 represents a comprehensive summary of the existing literature on (TAM) and (UTAUT), which has been gathered as part of this study. This summary aims to facilitate comprehension and provide a consolidated overview of the relevant research.

Table 2.1 Summarization for TAM and UTAUT literature

| **Authors and Year** | **Title** | **Theory** | **Target Population** | **Variables.** |
|---|---|---|---|---|
| (Aldosari et al. 2018) | Assessment of factors influencing nurses' acceptance of electronic medical record in a Saudi Arabia hospital | TAM | Nurses | PU, PEOU, Top-Management and IT support, System Quality |
| (Thit et al. 2020) | User acceptance of electronic medical record system in Myanmar | TAM | Health care providers | PU, PEOU, IU, Computer, Knowledge, ICT Knowledge. |
| (Pavlovic et al. 2021) | Electronic Health Record Acceptance by Physicians in Pancevo, Serbia | TAM | Physicians | PEOU, PU, Attitude toward use, technical characteristics, Computer use |
| (Alhur 2023) | Investigation of Nurses' Perceptions of the Usefulness and Easiness of Using Electronic Medical Records in Saudi Arabia | TAM | Nurses | PU, PEOU, Attitude toward using. |

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| | | | | |
|---|---|---|---|---|
| (Hossain, Quaresma & Rahman 2019) | Investigating factors influencing the physicians' adoption of electronic health record (EHR) in healthcare system of Bangladesh. | UTAUT | Physicians | PE, EE, SI, FC, BI, UB, Personal innovation in IT, Resistance to Change |
| (Lulin et al. 2020) | Nurses' Readiness in the Adoption of Hospital Electronic Information Management Systems in Ghana. | UTAUT | Nurses | PE, EE, BI, UB |
| **(**Alsahafi, Gay & Khwaji 2020**)** | Acceptance of National Electronic Health Records in Saudi Arabia: Healthcare Consumers' Perspectives | UTAUT | Consumers | PE, EE, SI, BI, Security Concerns, Trust |
| (Yousef et al. 2021) | Health care providers' acceptance of a personal health record: Cross-sectional study in Saudi Arabia | UTAUT | Healthcare providers | PE, EE, SI, FC, BI to recommend PHRs, Attitude |



## 2.9 CHAPTER SUMMARY

In this chapter we went from general to specific literature that talked about EHRs definition, benefits, barriers, challenges, and acceptance. Based on two frameworks that can help us in our study to measure the acceptance of the EHRs from nurses' perspective in Jordan. The TAM model does not have enough variables to cover the acceptance among nurses, but the original UTAUT model has enough variables to cover based on the literature and should take all UTAUT variables into account.

# CHAPTER III

# METHODOLOGY

## 3.1 INTRODUCTION

The development of the questionnaire based on the literature, the manner in which the data gathered, and the analysis of the data that has been obtained are all topics that covered in this chapter. Also address the method that used to cover the objectives that have been spoken about in the previous chapters.

Based on assumptions and gaps in the existing literature, the purpose of this study was to determine the relationship between nurses' acceptance of electronic health records (EHRs) and the factors that influence acceptance. Additionally, determine the specifics of the technique that used to address the issues that have been identified. This approach would be appropriate for the goal of the study, and to accomplish this, the research design was developed to provide the researcher with direction regarding the appropriate sources for data collecting, as well as the methods for analysing the data, such as making use of descriptive statistics and statistical inference.



## 3.2 RESEARCH DESIGN

In this project used a cross sectional study using a Quantitative approach based on questionnaire. The quantitative approach with a questionnaire allows for systematic and standardization of the collection of data on nurses' acceptance and usage of Electronic Health Record systems. It provides numerical data that can be analyzed statistically to identify the factors influencing their acceptance and usage.

Taking into consideration the literature, the questionnaires used particularly because they are an effective tool for collecting data from a wide sample of nurses. This

method also makes it possible to collect a substantial quantity of information in a relatively short amount of time. Using a questionnaire, it is possible to guarantee consistency in the gathering of data, so minimizing bias and increasing the reliability of the findings.

## 3.3 SAMPLE SELECTION

The target population in this project consist of nursing from various sectors in governmental hospital in Jordan King Abdullah University Hospital (KAUH). The sample encompasses individuals with different educational backgrounds bachelor's, diploma, and master's degrees in nursing and furthermore the sample have different ages of group from nurses depending on their experience in healthcare settings.

It is possible that the acceptance of the electronic health record system by nurses, who make up the largest group of end users in the hospital, might be an important factor and reflect the effective implementation of the system.

To gain full understanding of the factors that can influence the acceptance and usage of the electronic health record. Conducted demographic data from the participants such as age, gender, experience and educational background, these characteristics is relevant to the research objectives of this study because these factors can give a valuable insight that influence the acceptance and the successful implementation of the electronic health records system.



## 3.4 DATA COLLECTION PROCEDURE

After reading the literature we choose a quantitative approach using the UTAUT Model developed by Venkatesh and colleagues in. (2003) and a questionnaire from Hossain, Quaresma & Rahman (2019) this method it is the best method to get a large sample from nurses with a short period of time.

### 3.4.1 Questionnaire Design

Using a five-point Likert scale that ranges from strongly agreeing (1) to strongly disagreeing, create a questionnaire that consists of multiple-choice questions that is designed to capture the factors that influence nurses' adoption and usage of electronic health record systems.

Using validated model, the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003) to assess factors such complexity, usability, and organizational support of the EHRs. Include demographic questions to gather background information about the nurses such as (age, experience, gender, and current position, level of education) UTAUT questionnaire variables based on this study done by Hossain, Quaresma & Rahman (2019). Then this questionnaire was Distributed to the nurses through online platforms google form. And there was a clear instruction at the top of the questionnaire to complete the questionnaire and ensure confidentiality and anonymity of responses to remove any bias and for honesty while completing the questionnaire.

Ethical considerations were carefully considered and prior doing the study the top management was asked to take their acceptance to do the research on nurses', and the information of the participants was the utmost confidentiality of these collected data and used solely for academic purposes only.



### 3.4.2 Variables assessment and measurements

As shown in Table 3.1 these were the variables and the numbers of items included in this study that was measured.

Table 3.1 Table Variables

| Variables | References | Number of Items |
|---|---|---|
| FC: FACILITATING CONDITIONS | (Venkatesh et al. 2003) | 4 |

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| | | |
|---|---|---|
| EE: EFFORT EXPECTANCY | (Venkatesh et al. 2003) | 3 |
| SI: SOCIAL INFLUENCE | (Venkatesh et al. 2003) | 3 |
| PE: PERFORMANCE EXPECTANCY | (Venkatesh et al. 2003) | 4 |
| BI: BEHAVIOR INTENSION | (Venkatesh et al. 2003) | 3 |
| UB: USE BEHAVIOR | (Venkatesh et al. 2003) | 3 |
| DEMOGRAPHIC DATA | Age, gender, nursing experience, position, ward, level of education | |

**i. FC: Facilitating conditions**

The extent to which the resources and support required to make advantage of the technology are available (Venkatesh et al. 2003). This variable can measure the resources needed to be a successful implementation of the EHRs that using by nurses because without it the nurses may faces obstacles during entering the data into the system and that may affect the acceptance and usage of the electronic health records system, and Table 3.2 shows the items that took from the literature and what code are going to be used in the analysis phase.



Table 3.2 Facilitating Conditions Items

| ITEMS | References | Coding |
|---|---|---|
| I HAVE THE RESOURCES NECESSARY TO USE THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | FC1 |
| I HAVE THE KNOWLEDGE NECESSARY TO USE THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | FC2 |
| iSOFT SYSTEM IS COMPATIBLE WITH OTHER SYSTEMS I USE. | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | FC3 |
| PERSON/GROUP IS AVAILABLE FOR ASSISTANCE WITH DIFFICULTIES EXPERIENCED WITH THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | FC4 |

### ii. EE: Effort Expectancy

Determines the extent to which an individual believes that the technology will be simple and will need little effort on their part (Venkatesh et al. 2003). This variable can measure how much the individual (nurse) put effort to finish certain task is it easy or hard and Table 3.3 shows the items that took from the literature and what code are going to be used in the analysis phase.

Table 3.3 Effort Expectancy Items

| Items | References | Coding |
|---|---|---|
| MY INTERACTION WITH THE iSOFT SYSTEM WOULD BE CLEAR AND UNDERSTANDABLE. | (Hossain, Quaresma & Rahman 2019) (Johnson 2020) | EE1 |
| IT WOULD BE EASY FOR ME TO BECOME SKILLFUL AT USING THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019) (Johnson 2020) | EE2 |
| I WOULD FIND THE iSOFT SYSTEM EASY TO USE. | (Hossain, Quaresma & Rahman 2019) (Johnson 2020) | EE3 |



### iii. SI: Social influence

It refers to the extent to which individuals believe that significant others, such as family, friends, and coworkers, share their opinion that they should make use of technology. (Venkatesh et al. 2003). This variable measures how the individual perceived from colleagues at work how to use the technology and how they influence in positive or negative way in the acceptance and usage of the EHRs, and Table 3.4 shows the items that took from the literature and what code are going to be used in the analysis phase

Table 3.4 Social Influence Items

| Items | References | Coding |
|---|---|---|
| THE PERSON IN CHARGE WHO INFLUENCES MY BEHAVIOR THINKS THAT I SHOULD USE THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019) (Johnson 2020) | SI1 |

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…continuation

| | | |
|---|---|---|
| MY COLLEAGUES THINK THAT I SHOULD USE THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | SI2 |
| THE SENIOR MANAGEMENT IN THIS HOSPITAL GIVING ME MOTIVATION TO USE OF THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | SI3 |

**iv. PE: Performance Expectancy**

Determines the extent to which an individual acknowledges the ways in which technology might assist them in accomplishing their job in a more efficient manner (Venkatesh et al. 2003). This variable measures how the individual finishes their tasks in an easy way, to be more efficient and effective in working with electronic health records and that may influence the acceptance and usage of EHRs and Table 3.5 shows the items that took from the literature and what code are going to be used in the analysis phase



Table 3.5 Performance Expectancy Items

| Items | References | Coding |
|---|---|---|
| I WOULD FIND THE iSOFT SYSTEM USFUL IN MY JOB | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | PE1 |
| USING THE iSOFT SYSTEM ENABLES ME TO ACCOMPLISH TASKS MORE QUICKLY | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | PE2 |
| USING THE iSOFT SYSTEM INCREASE MY PRODUCTIVITY | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | PE3 |
| IF I USE THE iSOFT SYSTEM, I WILL INCREASE MY CHANCES OF GETTING A SALARY INCREASE OR PROMOTION | (Hossain, Quaresma & Rahman 2019)<br>(Johnson 2020) | PE4 |

**v. BI: Behavioural Intention**

The extent to which persons who have a strong intention to use a technology are more likely to acquire and use that technology themselves. (Venkatesh et al. 2003). is

considered a key to determine technology acceptance and usage behaviours of the EHRs that are influenced by four main variables (FC, EE, SI, PE), and Table 3.6 shows the items that took from the literature and what code are going to be used in the analysis phase.

Table 3.6 Behavioural Intention Items

| Items | References | Coding |
|---|---|---|
| I INTEND TO USE THE iSOFT SYSTEM IN FUTURE. | (Hossain, Quaresma & Rahman 2019) (Johnson 2020) | BI1 |
| I WILL ALWAYS TRY TO USE THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019) (Johnson 2020) | BI2 |
| I PLAN TO CONTINUE TO USE THE iSOFT SYSTEM FREQUENTLY. | (Hossain, Quaresma & Rahman 2019) (Johnson 2020) | BI3 |

**vi. UB: Actual Use behaviour**

This variable directly reflects the adoption and usage behaviour of individuals. Helps the researchers and practitioners to understand the extent to which individuals have successfully implemented the technology into their work, and Table 3.7 shows the items that took from the literature and what code are going to be used in the analysis phase.



Table 3.7 Use behaviour Items.

| Items | References | Coding |
|---|---|---|
| I USE THE iSOFT SYSTEM CURRENTLY. | (Hossain, Quaresma & Rahman 2019) | UB1 |
| THE iSOFT SYSTEM IS A PLEASANT EXPERIENCE. | (Hossain, Quaresma & Rahman 2019) | UB2 |
| I SPEND A LOT OF TIME ON THE iSOFT SYSTEM. | (Hossain, Quaresma & Rahman 2019) | UB3 |

### 3.4.3 Research Sample size.

Determine the proper sample size for a quantitative research project is an essential component that must be taken into consideration. to ensure the data meaningful, based on the literature for sample size and statistical analysis literature, the sample size should be at least five times the number of variables in the analysis with an acceptable ratio

being 10:1 (Ho Robert 2006), alternatively a common accepted guidelines is to have sample size around 200, while a sample size 300 is acceptable for statistical analysis using SEM (Hossain, Quaresma & Rahman 2019), the sample size also depends on the total population of the survey, the estimation number for this study based on the variables in this project it's going to be around 250 respondents. to fulfil the basic standards of the literature, and the total number of registered nurses working at KAUH is around 800.

### 3.4.4 Research Model and Hypothesis

H1: PE positively affects behavioural intension.

H2: EE positively affects behavioural intension.

H3: SI positively affects behavioural intension.

H4: FC positively affects behavioural intension.

H5:BI significantly affects nurses the use behaviour of the EHR system.

The Figure 3.1 showing the possible hypothesis and structure for the analysis based on the literature.

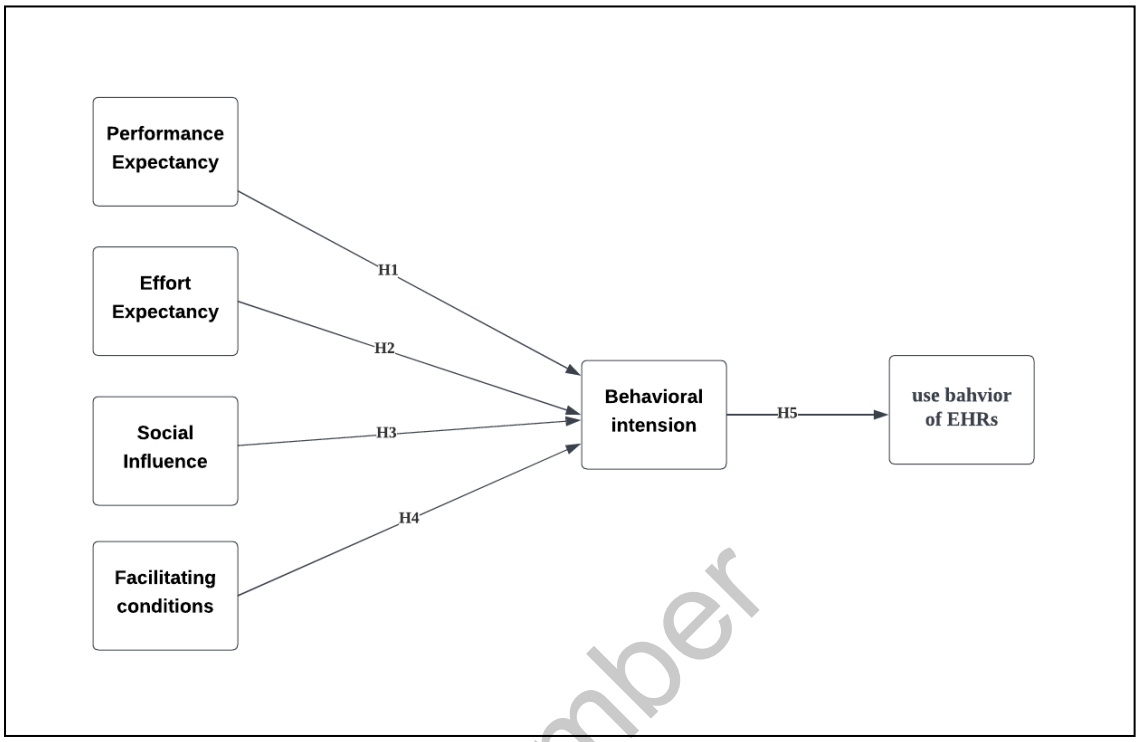


Figure 3.1 UTAUT predictive model and Hypotheses.



## 3.5 DATA ANALYSIS

For research model, the most suitable statistical analysis is path analysis. This method allows us to examine the causal relationships among multiple variables. To be more specific, the interested in gaining a knowledge of the ways in which perceived expectancy (PE), social influence (SI), facilitating conditions (FC) and effort expectancy (EE), influence behavioral intention (BI). Through the use of path analysis, we are able to evaluate the direct as well as the indirect effects that these variables have on BI.

In Chapter 3, the research methodology was broken down in detail, covering the factors and the data collection. Chapter 4 provides a detailed description of the subsequent data analysis, which was carried out using a variety of meticulous approaches. The descriptive analysis offered a comprehensive overview, the trend of the sample's opinions concerning the statements of the axis was investigated, and the path analysis investigated relationships and estimation. The reliability analysis evaluated the consistency of the data, the normality test evaluated the distribution of the variables, and the descriptive analysis gave a comprehensive overview. Through the

process of hypothesis testing, research hypotheses were validated. The purpose of each analytical method is to uncover patterns, trends, and linkages within the dataset in order to gain a deeper understanding of the study concerns.

In order to acquire a thorough grasp of our dataset, it is necessary to carry out exploratory data analysis (EDA), in addition to route analysis. Descriptive statistics, such as calculating means, medians, and standard deviations, are performed as part of the EDA process. In addition, it enables the display of data using graphs and charts, which can be of use in determining the possible links that exist between variables.

## 3.6 CHAPTER SUMMARY

In this chapter discussed what methodology was used. It was a quantitative approach with a questionnaire to collect large samples and to cover all the objectives in a short period of time.

The model is going to be UTAUT model. This model has been chosen based on the problem statement in the literature because this model has many variables it can influence the acceptance and usage for the EHRs. Like organizational factors, usability, and flexibility of the system al of these criteria play a significant part in determining whether electronic health records (EHRs) are accepted and utilized, particularly by nursing staff. This is because nursing staff constitutes a substantial group in each department of the hospital, and they are the first line of healthcare providers. In this situation the EHRs must be not complex and they should got the right motivations from top managements to use the EHRs and they should got the proper training to have thorough knowledge of how to interact with the system without challenging any difficulties in the future all of that lead to enhance the workflow and patient care quality, that can be achieved through a successful implementation of the EHRs and will reflect on their acceptance for the EHRs.

# CHAPTER IV

# DATA ANALYSIS

## 4.1 INTRODUCTION

This chapter is centred around the analysis of questionnaires that have been completed by various nurse's background, including Nurse Managers, Registered Nurses, Clinical Resource Nurses, and Licensed Practical Nurses (LPN). The subject of inquiry is the adoption of the Electronic Health Records system, specifically the iSOFT system, among nurses working at King Abdullah University Hospital (KAUH) in Jordan. The primary aim of this chapter is to provide an overview of the questionnaire results and to examine the collective findings derived from these questionnaires.



## 4.2 DATA COLLECTION

The data collection is done by online questionnaire using google form, the questionnaire sent throw WhatsApp group for each section in the hospital, each floor has WhatsApp group, the questionnaire included the description how to fill it and the purpose of the study, and was sent to 600 nurses, 241 were answered and received. The study conducted between august 2023 and September 2023.

## 4.3 RELIABILITY ANALYSIS

Through the use of reliability analysis, one is able to investigate the characteristics of measuring scales and the components that comprise them. Not only does the process for reliability analysis calculate some of the most frequent measures of scale reliability, but it also offers information about the relationships that exist between the individual items that represent the scale. To put it another way, dependability refers to the extent to which

the observed variable accurately measures the measured value and does not contain any errors (Zikmund, 2000).

In order to determine the reliability of the entire set of data, the Cronbach alpha analysis was performed on each individual factor listed in the questionnaire. The values of Cronbach's alpha for the factors in this investigation are presented in Table 4.1.

Table 4.1 Cronbach alpha values

| No | Factor | Cronbach's Alpha |
|---|---|---|
| 1 | Performance Expectancy | 0.718 |
| 2 | Effort Expectancy | 0.863 |
| 3 | Facilitating Conditions | 0.700 |
| 4 | Social Influence | 0.784 |
| 5 | Behavioural Intention | 0.735 |
| 6 | Use behaviour | 0.817 |
| | Overall Cronbach's Alpha: | 0.865 |



These values in Table 4.1 indicate the reliability of the measurement scales used in the study. In most cases, the Cronbach's Alpha values fall within the range of 0.7 to 0.8, suggesting a moderate to good level of internal consistency among the items within each factor.

The overall Cronbach's Alpha for all factors is 0.865, surpassing the recommended threshold of 0.6. The fact that this is the case demonstrates that the measurement scales that were utilized in the research project are trustworthy and consistent in their ability to capture the intended constructs. In summary, the study's instruments demonstrate strong internal reliability, enhancing the trustworthiness of the research findings.

## 4.4 NORMALITY TEST

As a result of the fact that standard data is an underlying assumption in parametric testing, it is necessary to do an analysis of the normality of the data before conducting various statistical tests.

### 4.4.1 Normality Test for the demographic variables.

Skewness and kurtosis tests have been performed in order to determine whether or not the demographic variables are following the normal distribution. The results of these tests are presented in the Table 4.2, which contains the findings for the demographic variables.

Table 4.2 Normality tests for demographic variables

| No | Variable | Skewness Value | Kurtosis Value |
|---|---|---|---|
| 1 | Gender | -0.058 | -2.013 |
| 2 | Age | 0.502 | -0.282 |
| 3 | Position | -2.658 | 2.900 |
| 4 | Ward | 0.764 | -0.422 |
| 5 | Experience | -0.223 | -0.963 |
| 6 | Qualification | 1.304 | 0.259 |



Skewness and Kurtosis tests were performed on the demographic variables that were investigated, and the findings are presented in Table 4.2. The normality of the data distribution can be evaluated with the use of these tests. Based on the recommendations made by George and Mallery, the majority of the demographic data can be considered normal. This is because the Skewness and Kurtosis values are within the permissible range of ±3, which defines the acceptable range.

This suggests that the distribution of these variables is not significantly skewed or kurtotic, which is an important consideration for statistical analyses as it supports the assumption of normality, making the data suitable for various parametric statistical tests.

### 4.4.2 Normality Test for the “Performance Expectancy” Variable.

Table 4.3 Normality tests for “Performance Expectancy “Statement

| No | Variable | Skewness Value | Kurtosis Value |
|---|---|---|---|
| 1 | I would find the iSoft system useful in my job. | -1.310 | 3.195 |

to be continued…

…continuation

| | | | |
|---|---|---|---|
| 2 | Using iSoft system enables me to accomplish tasks more quickly. | -0.977 | 0.172 |
| 3 | Using the iSoft system increases my productivity. | -0.633 | -0.609 |
| 4 | If I use iSoft system, I will increase my chances of getting a salary increase or promotion. | 1.095 | 0.429 |

To determine whether or not the variables that fall under the "Performance Expectancy" component are normally distributed, the Skewness and Kurtosis tests were carried out. The results, as presented in Table 4.3, indicate that these variables generally exhibit normal distributions, as their Skewness and Kurtosis values fall within the acceptable range of -3 to +3. This suggests that the data for these variables is not significantly skewed or kurtotic, supporting the assumption of normality. This is an important consideration when performing various statistical analyses.



### 4.4.3 Normality Test for the “Effort Expectancy” Variable.

The researcher implemented Skewness and Kurtosis tests to know the normality levels of the “Effort Expectancy” factor variables; Table 4.4 shows the results.

Table 4.4 Normality tests for “Effort Expectancy” Statement

| No | Statement | Skewness Value | Kurtosis Value |
|---|---|---|---|
| 1 | My interaction with the iSoft system would be clear and understandable. | -0.995 | 0.247 |
| 2 | It would be easy for me to become skilful at using iSoft system. | -0.344 | -1.049 |
| 3 | I would find iSoft system easy to use. | -0.577 | -0.758 |

Table 4.4 displays the results of the skewness and kurtosis tests performed on the "Effort Expectancy" Statement. In the context of the Skewness, all assertions are presumed to be normally distributed, and the kurtosis values are within the range of ±3.

### 4.4.4 Normality Test for the "Facilitating Conditions" Variable.

The researcher implemented Skewness and Kurtosis tests to know the normality levels of the "Facilitating Conditions" factor variables; Table 4.5 shows the results.

Table 4.5 Normality tests for "Facilitating Conditions" Statements

| No | Statement | Skewness Value | Kurtosis Value |
|---|---|---|---|
| 1 | I have the knowledge necessary to use iSoft system. | -0.568 | -0.807 |
| 2 | I have the resources necessary to use iSoft system. | -1.268 | 1.279 |
| 3 | iSoft system is compatible with other systems I use. | -0.599 | -0.228 |
| 4 | A person/group is available for assistance with difficulties experienced with iSOFT system. | -0.984 | 0.386 |



Table 4.5 displays the results of the skewness and kurtosis tests performed on the "Facilitating Conditions" Statement. In the context of the Skewness, all assertions are presumed to be normally distributed, and the kurtosis values are within the range of ±3.

### 4.4.5 Normality Test for the "Social Influence" Variable.

The researcher implemented Skewness and Kurtosis tests to know the normality levels of the "Social Influence" variable; Table 4.6 shows the findings.

Table 4.6 Normality tests for "Social Influence" Statements

| No | Statement | Skewness Value | Kurtosis Value |
|---|---|---|---|

to be continued…

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| | | | |
|---|---|---|---|
| 1 | The person in charge who influences my behaviour thinks that I should use the iSoft system. | -1.756 | 2.035 |
| 2 | My colleagues think that I should use the iSoft system. | -1.601 | 2.300 |
| 3 | The senior management in this hospital gave me the motivation to use of iSoft system. | -0.623 | -0.289 |

Table 4.6 displays the results of the skewness and kurtosis tests performed on the "Social Influence" Statement. In the context of the Skewness, all assertions are presumed to be normally distributed, and the kurtosis values are within the range of ±3.

### 4.4.6 Normality Test for the "Behavioural Intention" Variable.

The researcher implemented Skewness and Kurtosis tests to know the normality levels of the "Behavioural Intention" factor variables; Table 4.7 shows the findings.



Table 4.7 Normality tests for "Behavioural Intention" Statement

| No | Statement | Skewness Value | Kurtosis Value |
|---|---|---|---|
| 1 | I intend to use iSoft system in future. | -1.188 | 2.214 |
| 2 | I will always try to use iSoft system. | -1.571 | 4.609 |
| 3 | I plan to continue to use iSoft system frequently. | -1.304 | 1.837 |

Table 4.7 displays the results of the skewness and kurtosis tests performed on the "Behavioural Intention" Statement. In the context of the Skewness, all assertions are presumed to be normally distributed, and the kurtosis values are within the range of ±3.

### 4.4.7 Normality Test for the "Use behaviour" Variable.

The researcher implemented Skewness and Kurtosis tests to know the normality levels of the "Use behaviour" factor variables; Table 4.8 shows the findings.

Table 4.8 Normality tests for "Use behaviour" Statement.

| No | Statement | Skewness Value | Kurtosis Value |
|---|---|---|---|
| 1 | I use the iSoft system currently. | -1.188 | 2.214 |
| 2 | iSoft system is a pleasant experience. | -1.571 | 4.606 |
| 3 | I spend a lot of time on iSoft system. | -1.304 | 1.837 |

Table 4.8 displays the results of the skewness and kurtosis tests performed on the "Use behaviour" Statement. In the context of the Skewness, all assertions are presumed to be normally distributed, and the kurtosis values are within the range of ±3.



## 4.5 DESCRIPTIVE ANALYSIS

Descriptive analysis serves the purpose of providing a clear and meaningful summary of data. It enables us to describe, illustrate, and consolidate the information contained within our dataset. It's important to note that the primary goal of descriptive analysis is to depict the data as it is, without drawing any inferences or making conclusions beyond the data itself. It does not permit us to reach findings related to hypotheses or make broader conclusions; instead, it offers a way to portray and comprehend the characteristics of our data. In the following subsections, we present the descriptive analysis of the demographic variables within the scope of this study.

### 4.5.1 Gender descriptive analysis

Table 4.9 provides a descriptive analysis of the distribution of gender within the sample, while Figure 4.1 visually represents this information. The table reveals that 51.5% of the sample consists of males, whereas 48.5% are females. This illustrates the gender composition within the study.

Table 4.9 Gender descriptive analysis

| Gender | Frequency | Percent (%) |
|---|---|---|
| Male | 117 | 48.5 |
| Female | 124 | 51.5 |
| Total | 241 | 100.0 |

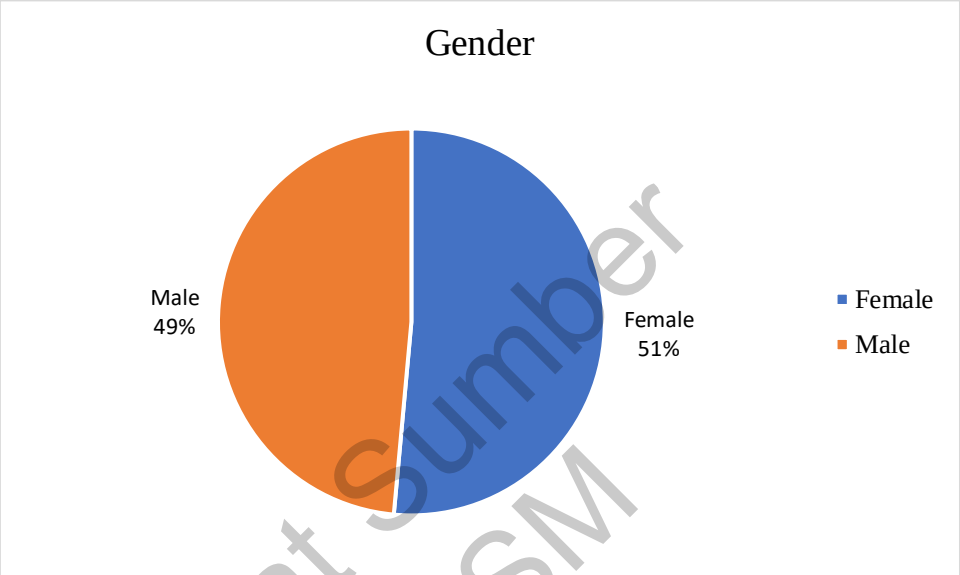


Figure 4.1 distribution of gender



### 4.5.2 Age descriptive analysis

Table 4.10 and Figure 4.2 provides the descriptive analysis of the age groups within the sample. Notably, the age group "25-30 years" is the largest, comprising 36.9% of the total, making it the most prominent segment. Following that, the age group "31-35 years" represents 34.4% of the sample. The other age groups have smaller percentages, with "36-40 years" at 21.2%, "41-45 years" at 5%, and "46-50 years" at 0.4%. These findings provide an overview of the age distribution within the study.

Table 4.10 Age descriptive analysis

| Age Group | Frequency | Percent (%) |
|---|---|---|
| < 25 | 5 | 2.1 |

to be continued…

…continuation

| | | |
|---|---|---|
| 25-30 | 89 | 36.9 |
| 31-35 | 83 | 34.4 |
| 36-40 | 51 | 21.2 |
| 41-45 | 12 | 5 |
| 46-50 | 1 | 0.4 |
| Total | 241 | 100.0 |

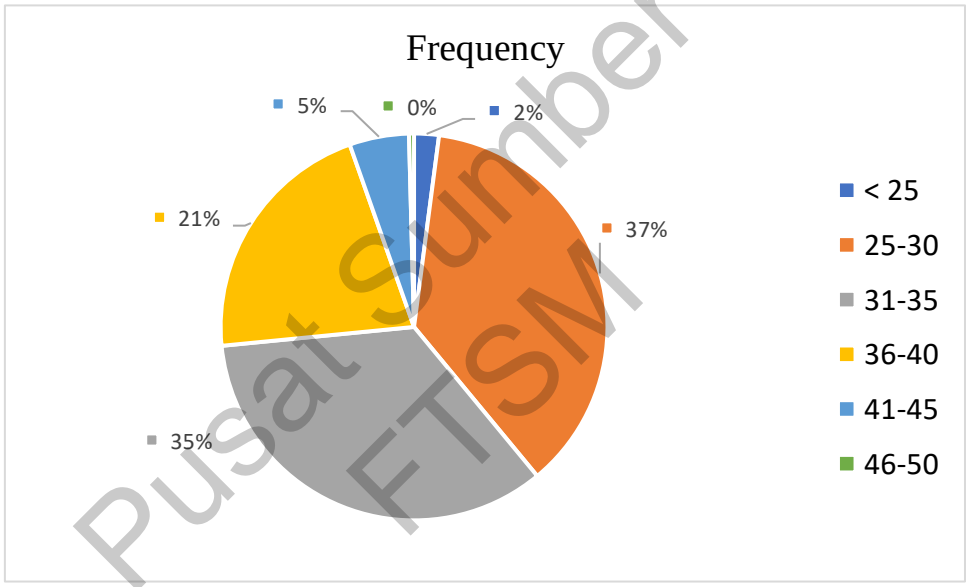




Figure 4.2 Age groups descriptive analysis

### 4.5.3 Position descriptive analysis.

Table 4.11 and Figure 4.3 provides the descriptive analysis of position groups within the sample. It is worth noting that "Registered Nurse" is the dominant category, representing 95.9% of the total, while "Nurse Manager" constitutes 3.3%. The category "Clinical Resource Nurse" accounts for a smaller proportion at 0.8%. These statistics provide insight into the distribution of positions among the study participants.